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See Proposed Change to Tech Specs

SUBJECT: Forwards response to 970328 & 0409 RAI re change request to convert to Improved Standard TSs submitted on 960827. Supplement 4 to TS change request, also encl. NRC agreed to extend due date for response until 970602, per 970522 telcon.

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CP&L

Carolina Power & Light Company
Robinson Nuclear Plant
3581 West Entrance Road
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RNP File No: 13510HA
Serial: RNP-RA/97-0123

MAY 30 1997

United States Nuclear Regulatory Commission
Attn: Document Control Desk
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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
AND TRANSMITTAL OF SUPPLEMENT 4 REGARDING THE
TECHNICAL SPECIFICATION CHANGE REQUEST TO CONVERT
TO THE IMPROVED STANDARD TECHNICAL SPECIFICATIONS

Gentlemen:

This letter provides Carolina Power & Light (CP&L) Company responses to the NRC requests for additional information (RAI) dated March 28, 1997, and April 9, 1997, regarding the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 Improved Technical Specifications (ITS) conversion submittal of August 27, 1996. The responses pertain to ITS Sections 1.0, "Use and Application," 2.0, "Safety Limits," 3.3, "Instrumentation, 3.8, "Electrical Power Systems," 4.0, "Design Features," and 5.0, "Administrative Controls." In order to support the NRC review schedule for this submittal, the NRC has requested that the response to their request be submitted within 30 days of receipt of their letters. In a meeting between CP&L and the NRC on April 30, 1997, the NRC agreed to extend the due date for the responses to their requests by two weeks for the letter dated March 28, 1997, and two days for the letter dated April 9, 1997 (i.e., May 23, 1997). In a telephone conversation conducted on May 22, 1997, the NRC agreed to extend the due date for the responses to their requests until June 2, 1997.

Attachment I provides an affidavit as required by 10 CFR 50.30(b).

A001/1

The response to the NRC's request for additional information is provided as Attachments II through VII to this letter. The responses are provided in table format similar to the question format provided in the NRC letters dated March 28, 1997, and April 9, 1997.

Attachment VIII contains the company setpoint methodology procedure as requested in the RAI dated March 28, 1997.

Attachment IX contains Supplement 4 to the ITS conversion submittal dated August 27, 1996. The August 27, 1996, submittal was previously modified by letters dated December 18, 1996, January 17, 1997, March 27, 1997, April 6, 1997, and April 25, 1997. Supplement 4 contains submittal pages which have been revised in response to the NRC's requests for additional information The supplement includes instructions for insertion of pages into the submittal. The supplement also contains changes to the submittal described below.

The proposed ITS Limiting Condition for Operations (LCO) 3.1.7 is revised in its entirety to conform with the current licensing basis. Specifically, Surveillance Requirement (SR) 3.1.7.1 from NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," Revision 1 (i.e., ISTS) was included in the original submittal as the SR to verify OPERABILITY of the Analog Rod Position Indication (ARPI) system. However, during development of implementation procedures, it was found that the SR as originally proposed, which required that the ARPIs be verified along its full range, could not be satisfied without shutting down the reactor if the ARPIs are adjusted on line. Hence, the current SRs which include a channel check and verification of ARPI position are the only SRs that can be performed on line. To support OPERABILITY across the full range of ARPI, the CHANNEL CALIBRATION will include a verification of voltages. Since voltage verification was not performed in the last outage, SR 3.1.7.4 will not be satisfied upon implementation, and the NRC is requested to allow the first performance of this SR in the next refueling outage (i.e., Refueling Outage 18). Required Actions were also modified to be consistent with the SRs.

In response to NRC Question 3.8.1-15, the ITS has been revised to incorporate a SR from NUREG-1431 to perform a partial load rejection. CP&L has not confirmed the acceptance criteria for the test as adequate and appropriate to the plant design. The acceptance criteria for SR 3.8.1.8 has been bracketed until the acceptance criteria for the test can be confirmed.

The submittal inappropriately proposed to relocate certain operating license conditions (i.e., license conditions G(1), G(2), G(3), and G(4)) to either ITS Section 5.5 as administrative programs or to licensee controlled documents. Therefore, the submittal has been modified to remove any proposal to change the operating license, and to duplicate existing license conditions in ITS Section 5.5 without modification for those programs that correspond to programs identified in NUREG-1431. This modification to the submittal will preserve consistency with NUREG-1431 without affecting the operating license conditions. Discussion of Change (DOC) A22 has been added to justify the change for ITS Section 5.0, "Administrative Control."

The ITS submittal for the Diesel Fuel Oil Testing Program and the Bases to SR 3.8.3.2 did not appropriately reflect the current licensing basis by including a CP&L response to a Notice of Deviation by letter dated January 31, 1992, and the NRC Inspection Report,

dated December 28, 1992, which evaluated the CP&L response. The CP&L response discussed an alternate sampling method to the ASTM sampling methods. Additionally, CP&L has revised the program to verify the fuel oil in the Unit No. 1 fuel oil storage tanks to be within limits since the fuel oil inventory in the Unit No. 1 tanks supports OPERABILITY for LCO 3.8.3, "Diesel Fuel Oil and Starting Air."

ITS Section 5.5.11, "Ventilation Filter Testing Program," has been revised to reflect corrections in flow rates and referenced standards to be consistent with the current licensing basis.

Development of procedure revisions to implement the ITS has been ongoing in parallel with the effort associated with responding to the NRC RAIs on the submittal. As a result of implementation procedure development, several changes to the submittal were made necessary which are described below.

Note 2 to SR 3.3.1.3 was changed to allow 36 hours rather than the original 24 hours for this SR to be required to be performed. This change was necessary based on previous plant history for stabilizing the plant, performing flux maps, and calibration of detectors.

Notes to ITS LCO Required Actions Q and R would not be adequate for allowing maintenance on a single train. Accordingly, the notes were revised to allow 12 hours for bypassing a single train without specifying surveillance testing as the basis for the note. Appropriate justifications were provided.

A recalculation of the setpoint allowable values was performed for ITS LCO 3.3.1, Setpoints and Allowable for Function 2, "Power Range Neutron Flux," Function 4, "Source Range Neutron Flux," Function 17.a, "Intermediate Range Neutron Flux, P-6," and Function 17c, "Power Range Neutron Flux P-8," and Function 17d, "Power Range Neutron Flux P-10" that resulted in new values. The new calculations corrected erroneous drift assumptions for the nuclear instrumentation from the current surveillance frequency to the proposed 92 day Channel Operational Test Frequency.

Performance of a CHANNEL CALIBRATION on the P-7 block in ITS LCO 3.3.1 is inappropriate for the HBRSEP, Unit No. 2 design. The submittal was therefore revised to require a Trip Actuating Device Operational Test (TADOT) on P-7. Similarly, a CHANNEL CALIBRATION for containment isolation valve position indication in ITS LCO 3.3.3, "Post Accident Monitoring (PAM) Instrumentation," is also inappropriate for the HBRSEP, Unit No.2 design. The definition of CHANNEL CALIBRATION cannot be applied to this function. The ITS was revised to require a TADOT for this function, add a note that the TADOT not require verification of setpoint, and revise the note to SRs accordingly. Since these changes are generic to NUREG-1431, Revision 1, a generic change was submitted to the Westinghouse Owners Group.

The lag constants on the overpower and overtemperature trips were revised on pages 6 and 7 of ITS Table 3.3.1-1 to allow for equipment tolerance during adjustment of the setpoint.

As a plant specific clarification to the Bases to LCO 3.3.1, the Bases were revised to eliminate reference to the Turbine Impulse Pressure input to P-7 as being an interlock. There are no interlock functions to this input to P-7.

The LCO discussion in the Bases to LCO 3.3.6 was revised to clarify that the pushbutton for Containment Ventilation Isolation actuation also activates Containment Phase A Isolation. This change was made to clear up confusion from the original ITS bases, taken from NUREG-1431, that assumed a separate pushbutton for this purpose.

The note to LCO 3.4.8 needed an exemption to de-energize both residual heat removal (RHR) pumps for up to 15 minutes to permit testing of the RHR loop supply valves. The LCO note was revised to accommodate RHR loop supply valve testing.

ITS SR 3.7.11.1 was revised to reflect the operating design of the Fuel Building Air Cleanup System filter bank heaters.

If you have any questions concerning this matter, please contact me or Mr. H. K. Chernoff of my staff at (803) 857-1437.

Very truly yours,

for T. M. Wilkerson
Manager - Regulatory Affairs

ALG/alg
Attachments

I. Affidavit

II. Response To Request For Additional Information Regarding The Technical Specifications Change Request To Convert To The Improved Standard Technical Specifications, Section 1.0, "Use and Application"

III. Response To Request For Additional Information Regarding The Technical Specifications Change Request To Convert To The Improved Standard Technical Specifications, Section 2.0, "Safety Limits"

IV. Response To Request For Additional Information Regarding The Technical Specifications Change Request To Convert To The Improved Standard Technical Specifications, Section 3.3, "Instrumentation"

V. Response To Request For Additional Information Regarding The Technical Specifications Change Request To Convert To The Improved Standard Technical Specifications, Section 3.8, "Electrical Power Systems"

VI. Response To Request For Additional Information Regarding The Technical Specifications Change Request To Convert To The Improved Standard Technical Specifications, Section 4.0, "Design Features"

VII. Response To Request For Additional Information Regarding The Technical Specifications Change Request To Convert To The Improved Standard Technical Specifications, Section 5.0, "Administrative Controls"

VIII. Carolina Power & Light Company Setpoint Methodology Procedure

IX. Technical Specifications Change Request To Convert To The Improved Standard Technical Specifications, Supplement 4

c: Mr. M. K. Batavia, Chief, Bureau of Radiological Health (SC)
Mr. L. A. Reyes, Regional Administrator, USNRC, Region II
Ms. B. L. Mozafari, USNRC Project Manager, HBRSEP (4 copies)
Mr. B. B. Desai, USNRC Resident Inspector, HBRSEP
Attorney General (SC) (w/out Enclosures)
Lockheed Idaho Technology, Inc.

Affidavit

State of South Carolina
County of Darlington

J. S. Keenan, having been first duly sworn, did depose and say that the information contained in letter RNP-RA/97-0123 is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, contractors, and agents of Carolina Power & Light Company.

John S. Keenan

Sworn to and subscribed before me
30th AG 5/30/97
this ~~22nd~~ day of May 1997

(Seal) ___________________________
Notary Public for South Carolina

My commission expires: March 22nd 2005

50-261 CP&L ROBINSON 2

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION & TRANSMITTAL OF SUPPLEMENT 4 RE TECH SPECS CHANGE REQUEST TO CONVERT OF IMPROVED TECH SPECS. Volume 1

Docket #__________
Accession #9706040301
Date 5/30/97 of Ltr
Regulatory Docket File

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- NOTICE -

A.1

Condition A applies to the LOP DG start Function with one or more loss of voltage channels per bus inoperable.

If one or more channels are inoperable, Required Action A.1 requires that channels be restored to OPERABLE status within one hour. With one or more Loss of Voltage Function channels inoperable, a loss of the required function may have occurred.

The 1 hour Completion Time allows for time to repair most failures and takes into account the low probability of an event requiring an LOP actuation during this interval.

BASES

1

ACTIONS (continued)

C.1 D

Condition C applies to each of the LOP DG start Functions when the Required Action and associated Completion Time for Condition A or B are not met. A, B or C

103

In these circumstances the Conditions specified in LCO 3.8.1. "AC Sources - Operating," or LCO 3.8.2. "AC Sources - Shutdown." for the DG made inoperable by failure of the LOP DG start instrumentation are required to be entered immediately. The actions of those LCOs provide for adequate compensatory actions to assure unit safety.

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure: thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

105

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

(continued)

Supplement 4

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.2 (1)

SR 3.3.5.2 is the performance of a TADOT. This test is performed every [31 days] (18 months). The test checks trip devices that provide actuation signals directly, bypassing the analog process control equipment. ~~For these tests, the relay Trip Setpoints are verified and adjusted as necessary.~~ (110) The Frequency is based on the known reliability of the relays and controls and the multichannel redundancy available, and has been shown to be acceptable through operating experience.

The SR is modified by a Note that excludes verification of the setpoint from the TADOT. Setpoint verification is accomplished during the CHANNEL CALIBRATION.

SR 3.3.5.3 (2)

SR 3.3.5.3 is the performance of a CHANNEL CALIBRATION.

The setpoints, as well as the response to a loss of voltage and a degraded voltage test, [shall] (should) include a single point verification that the trip occurs within the required time delay, as shown in Reference 1. (106)

A CHANNEL CALIBRATION is performed every [18] months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. (110)

The Frequency of [18] months is based on operating experience and consistency with the typical industry refueling cycle and is justified by the assumption of an [18] month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

REFERENCES

1. (U) FSAR, Section [8.3].
2. (U) FSAR, Chapter [15]. INSERT B 3.3.5-6
3. (3) ~~3. Unit Specific RTS/ESFAS Setpoint Methodology Study.~~

Supplement 4

Ventilation

1

B 3.3 INSTRUMENTATION

B 3.3.6 Containment Purge and Exhaust Isolation Instrumentation

BASES

BACKGROUND

Containment purge and exhaust isolation instrumentation closes the containment isolation valves in the Mini Purge System and the Shutdown Purge System. This action isolates the containment atmosphere from the environment to minimize releases of radioactivity in the event of an accident. The Mini Purge System may be in use during reactor operation and the Shutdown Purge System will be in use with the reactor shutdown.

Ventilation; Pressure and Vacuum Relief; normally; 107

Containment purge and exhaust isolation initiates on an automatic safety injection (SI) signal through the Containment Isolation Phase A Function, or by manual actuation of Phase A Isolation. The Bases for LCO 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," discuss these modes of initiation.

Ventilation; Containment Isolation; 110

Four radiation monitoring channels are also provided as input to the containment purge and exhaust isolation. The four channels measure containment radiation at two locations. One channel is a containment area gamma monitor and the other three measure radiation in a sample of the containment purge exhaust. The three purge exhaust radiation detectors are of three different types: gaseous, particulate, and iodine monitors. All four detectors will respond to most events that release radiation to containment. However, analyses have not been conducted to demonstrate that all credible events will be detected by more than one monitor. Therefore, for the purposes of this LCO the four channels are not considered redundant. Instead, they are treated as four one-out-of-one Functions. Since the purge exhaust monitors constitute a sampling system, various components such as sample line valves, sample line heaters, sample pumps, and filter motors are required to support monitor OPERABILITY.

INSERT B 3.3.6-1; two

Each of the purge systems has inner and outer containment isolation valves in its supply and exhaust ducts. A high radiation signal from any one of the four channels initiates containment purge isolation, which closes both inner and outer containment isolation valves in the Mini Purge System

either; ventilation; two; Pressure and Vacuum Relief

(continued)

Supplement 4

Ventilation

1

BASES

BACKGROUND (continued)

and the Shutdown Purge System. These systems are described in the Bases for LCO 3.6.3. "Containment Isolation Valves."

APPLICABLE SAFETY ANALYSES

The safety analyses assume that the containment remains intact with penetrations unnecessary for core cooling isolated early in the event, within approximately 60 seconds. The isolation of the purge valves has not been analyzed mechanistically in the dose calculations, although its rapid isolation is assumed. The containment purge and exhaust isolation radiation monitors act as backup to the SI signal to ensure closing of the purge and exhaust valves. They are also the primary means for automatically isolating containment in the event of a fuel handling accident during shutdown. Containment isolation in turn ensures meeting the containment leakage rate assumptions of the safety analyses. and ensures that the calculated accidental offsite radiological doses are below 10 CFR 100 (Ref. 1) limits.

Ventilation

Ventilation Isolation

The containment purge and exhaust isolation instrumentation satisfies Criterion 3 of the NRC Policy Statement.

LCO

The LCO requirements ensure that the instrumentation necessary to initiate Containment Purge and Exhaust Isolation. listed in Table 3.3.6-1. is OPERABLE.

Ventilation

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate Containment Purge Isolation at any time by using either of two switches in the control room. Either switch actuates both trains. This action will cause actuation of all components in the same manner as any of the automatic actuation signals.

pushbutton

pushbuttons

Phase A and Containment Ventilation Isolation automatic containment isolation valves, Containment Ventilation Isolation Can also be initiated by the Manual Containment Spray button.

The LCO for Manual Initiation ensures the proper amount of redundancy is maintained in the manual actuation circuitry to ensure the operator has manual initiation capability.

Each channel consists of one push button and the interconnecting wiring to the actuation logic cabinet.

(continued)

Supplement 4

Ventilation

BASES

(1)

LCO (continued)

2. Automatic Actuation Logic and Actuation Relays

The LCO requires two trains of Automatic Actuation Logic and Actuation Relays OPERABLE to ensure that no single random failure can prevent automatic actuation.

INSERT B 3.3.6-2

108

Automatic Actuation Logic and Actuation Relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b, SI, and ESFAS Function 3.a, Containment Phase A Isolation. The applicable MODES and specified conditions for the containment purge isolation portion of these Functions are different and less restrictive than those for their Phase A isolation and SI roles. If one or more of the SI or Phase A isolation Functions becomes inoperable in such a manner that only the Containment Purge Isolation Function is affected, the Conditions applicable to their SI and Phase A isolation Functions need not be entered. The less restrictive Actions specified for inoperability of the Containment Purge Isolation Functions specify sufficient compensatory measures for this case.

3. Containment Radiation

The LCO specifies four two required channels of radiation monitors to ensure that the radiation monitoring instrumentation necessary to initiate Containment Purge Ventilation Isolation remains OPERABLE.

For sampling systems, channel OPERABILITY involves more than OPERABILITY of the channel electronics. OPERABILITY may also require correct valve lineups, sample pump operation, and filter motor operation, as well as detector OPERABILITY, if these supporting features are necessary for trip to occur under the conditions assumed by the safety analyses.

4. Containment Isolation - Phase A

Refer to LCO 3.3.2, Function 3.a., for all initiating Functions and requirements.

(continued)

Supplement 4

The Automatic Actuation Logic and Actuation Relays actuate containment ventilation isolation upon receipt of an actuation signal from the Containment Radiation or Manual Initiation Functions. Containment ventilation isolation also initiates on an automatic safety injection (SI) signal when operating in MODES 1, 2, 3, and 4. The Bases for LCO 3.3.2, "Engineered Safety Features Actuation System (ESFAS) Instrumentation," discusses this mode of initiation.

Ventilation

BASES (continued)

APPLICABILITY

The Manual Initiation, Automatic Actuation Logic and Actuation Relays, Containment Isolation - Phase A, and Containment Radiation Functions are required OPERABLE in MODES 1, 2, 3, and 4, and during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment. Under these conditions, the potential exists for an accident that could release fission product radioactivity into containment. Therefore, the containment purge and exhaust isolation instrumentation must be OPERABLE in these MODES.

While in MODES 5 and 6 without fuel handling in progress, the containment purge and exhaust isolation instrumentation need not be OPERABLE since the potential for radioactive releases is minimized and operator action is sufficient to ensure post accident offsite doses are maintained within the limits of Reference 1.

ACTIONS

The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by unit specific calibration procedures. Typically, the drift is found to be small and results in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a COT, when the process instrumentation is set up for adjustment to bring it within specification. If the Trip Setpoint is less conservative than the tolerance specified by the calibration procedure, the channel must be declared inoperable immediately and the appropriate Condition entered.

A Note has been added to the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed in Table 3.3.6-1. The Completion Time(s) of the inoperable channel(s)/train(s) of a Function will be tracked separately for each Function starting from the time the Condition was entered for that Function.

A.1

Condition A applies to the failure of one containment purge isolation radiation monitor channel. Since the four containment radiation monitors measure different parameters,

(continued)

Handwritten annotations: ventilation; or Purging operations; INSERT 3.3.6-3; are; 1; 110; 34; Containment Radiation Functions are required to be OPERABLE during Purging, CORE ALTERATIONS, or movement of irradiated fuel assemblies within Containment.

Supplement 4

BASES

ACTIONS

A.1 (continued)

failure of a single channel may result in loss of the radiation monitoring Function for certain events. Consequently, the failed channel must be restored to OPERABLE status. The 4 hours allowed to restore the affected channel is justified by the low likelihood of events occurring during this interval, and recognition that one or more of the remaining channels will respond to most events.

B.1

Condition B applies to all Containment Purge and Exhaust Isolation Functions and addresses the train orientation of the Solid State Protection System (SSPS) and the master and slave relays for these Functions. It also addresses the failure of multiple radiation monitoring channels, or the inability to restore a single failed channel to OPERABLE status in the time allowed for Required Action A.1.

If a train is inoperable, multiple channels are inoperable, or the Required Action and associated Completion Time of Condition A are not met, operation may continue as long as the Required Action for the applicable Conditions of LCO 3.6.3 is met for each valve made inoperable by failure of isolation instrumentation.

A Note is added stating that Condition B is only applicable in MODE 1, 2, 3, or 4.

C.1 and C.2

Condition C applies to all Containment Purge and Exhaust Isolation Functions and addresses the train orientation of the SSPS and the master and slave relays for these Functions. It also addresses the failure of multiple radiation monitoring channels, or the inability to restore a single failed channel to OPERABLE status in the time allowed for Required Action A.1. If a train is inoperable, multiple channels are inoperable, or the Required Action and associated Completion Time of Condition A are not met, operation may continue as long as the Required Action to place and maintain containment purge and exhaust isolation

(continued)

Supplement 4

BASES

ACTIONS

C.1 and C.2 (continued)
A.1 and A.2

1 ,and 1/0 3

valves in their closed position is met or the applicable Conditions of LCO 3.9.4 "Containment Penetrations." are met for each valve made inoperable by failure of isolation instrumentation. The Completion Time for these Required Actions is Immediately.

A Note states that Condition C is applicable during CORE ALTERATIONS and during movement of irradiated fuel assemblies within containment.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.6-1 determines which SRs apply to which Containment Purge and Exhaust Isolation Functions.
Ventilation

SR 3.3.6.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure: thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.
the radiation monitor

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of

(continued)

BASES

1

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1 (continued)

channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.6.2

SR 3.3.6.2 is the performance of an ACTUATION LOGIC TEST. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and there is an intact voltage signal path to the master relay coils. This test is performed every 31 days on a STAGGERED TEST BASIS. The Surveillance interval is acceptable based on instrument reliability and industry operating experience.

test

108

SR 3.3.6.3

SR 3.3.6.3 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. This test is performed every 31 days on a STAGGERED TEST BASIS. The Surveillance interval is acceptable based on instrument reliability and industry operating experience.

INSERT B 3.3.6-4

SR 3.3.6.4

A COT is performed every 92 days on each required channel to ensure the entire channel will perform the intended Function. The Frequency is based on the staff recommendation for increasing the availability of radiation monitors according to NUREG-1366 (Ref. 2). This test verifies the capability of the instrumentation to provide the containment purge and exhaust system isolation. The

radiation monitor

initiate

Ventilation

112

(continued)

ITS Insert B 3.3.6-4 (Containment Ventilation Isolation Instrumentation)

The master relay is actuated by either a manual or automatic initiation of the function being tested. Contact operation is verified either by a continuity check of the circuit containing the master relay or proper operation of the end device during the supported equipment simulated or actual automatic actuation test. This test is performed every 18 months. The 18 month Frequency is adequate, based on industry operating experience, and is consistent with the typical refueling cycle, which provides the plant conditions necessary for testing.

(Ventilation) (1)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.4 (continued)

setpoint shall be left consistent with the current unit specific calibration procedure tolerance. (should) (18)

SR 3.3.6.5

SR 3.3.6.5 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation mode is either allowed to function or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation mode is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing the slave relay. This test is performed every [92] days. The Frequency is acceptable based on instrument reliability and industry operating experience.

(Insert B 3.3.6-5) (108)

SR 3.3.6.5

SR 3.3.6.6 is the performance of a TADOT. This test is a check of the Manual Actuation Functions and is performed every [18] months. Each Manual Actuation Function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.).

The test also includes trip devices that provide actuation signals directly to the SSPS, bypassing the analog process control equipment. The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Functions tested have no setpoints associated with them. (relay logic) (2)

The Frequency is based on the known reliability of the Function and the redundancy available, and has been shown to be acceptable through operating experience.

(continued)

Supplement 4

<u>ITS Insert B 3.3.6-5</u> (Containment Ventilation Isolation Instrumentation)

... either by a continuity check of the circuit containing the slave relay, or by verification of proper operation of the end device during supported equipment simulated or actual automatic actuation test. This test is performed every 18 months. The 18 month Frequency is adequate, based on industry operating experience, and is consistent with the typical refueling cycle, which provides the plant conditions necessary for testing.

BASES

(1)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.7

A CHANNEL CALIBRATION is performed every [18] months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

The Frequency is based on operating experience and is consistent with the typical industry refueling cycle.

REFERENCES

1. 10 CFR 100.11.

2. NUREG-1366, "Improvements to Technical Specification Surveillance Requirements," December, 1992.

BASES

APPLICABLE SAFETY ANALYSES (continued)

CORE ALTERATIONS(8) is the primary means to ensure control room habitability in the event of a fuel handling or waste gas decay tank rupture accident.

The CREFS actuation instrumentation satisfies Criterion 3 of the NRC Policy Statement.

LCO

The LCO requirements ensure that instrumentation necessary to initiate the CREFS is OPERABLE.

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate the CREFS at any time by using either of two switches in the control room. This action will cause actuation of all components in the same manner as any of the automatic actuation signals.

The LCO for Manual Initiation ensures the proper amount of redundancy is maintained in the manual actuation circuitry to ensure the operator has manual initiation capability.

Each channel consists of one push button and the interconnecting wiring to the actuation logic cabinet.

1. 2. Automatic Actuation Logic and Actuation Relays

The LCO requires two trains of Actuation Logic and Relays OPERABLE to ensure that no single random failure can prevent automatic actuation.

Automatic Actuation Logic and Actuation Relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b., SI, in LCO 3.3.2. The applicable MODES and specified conditions for the CREFS portion of these functions are different and less restrictive than those specified for their SI roles. If one or more of the SI functions becomes inoperable in such a manner that only the CREFS function is affected, the Conditions applicable to their SI function need not be entered. The less

(continued)

Supplement 4

BASES

LCO

1. 2. Automatic Actuation Logic and Actuation Relays (continued)

restrictive Actions specified for inoperability of the CREFS Functions specify sufficient compensatory measures for this case.

2. 3. Control Room Radiation Monitor

The LCO specifies two one required Control Room Atmosphere Area Radiation Monitors and two required Control Room Air Intake Radiation Monitors to ensure that the radiation monitoring instrumentation necessary to initiate the CREFS remains OPERABLE. OPERABLE

For sampling systems, channel OPERABILITY involves more than OPERABILITY of channel electronics. OPERABILITY may also require correct valve lineups, sample pump operation, and filter motor operation, as well as detector OPERABILITY, if these supporting features are necessary for trip to occur under the conditions assumed by the safety analyses. 18

3. 4. Safety Injection

Refer to LCO 3.3.2, Function 1, for all initiating Functions and requirements.

APPLICABILITY

The CREFS Functions must be OPERABLE in MODES 1, 2, 3, 4, and during CORE ALTERATIONS and movement of irradiated fuel assemblies. The Functions must also be OPERABLE in MODES [5 and 6] when required for a waste gas decay tank rupture accident, to ensure a habitable environment for the control room operators. 113

ACTIONS

The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the unit specific calibration procedures. Typically, the drift is found to be small and results in a delay of actuation rather

(continued)

Supplement 4

Not used.

BASES

(1)

ACTIONS (continued)

than a total loss of function. This determination is generally made during the performance of a COT, when the process instrumentation is set up for adjustment to bring it within specification. If the Trip Setpoint is less conservative than the tolerance specified by the calibration procedure, the channel must be declared inoperable immediately and the appropriate Condition entered.

A Note has been added to the ACTIONS indicating that separate Condition entry is allowed for each Function. The Conditions of this Specification may be entered independently for each Function listed in Table 3.3.7-1 in the accompanying LCO. The Completion Time(s) of the inoperable channel(s)/train(s) of a Function will be tracked separately for each Function starting from the time the Condition was entered for that Function. (34) are

A.1

Condition A applies to the automatic actuation logic train Function of the CREFS, the radiation monitor channel Functions, and the manual channel Functions. (110)

If one train is inoperable, or one radiation monitor channel is inoperable in one or more Functions, 7 days are permitted to restore it to OPERABLE status. The 7 day Completion Time is the same as is allowed if one train of the mechanical portion of the system is inoperable. The basis for this Completion Time is the same as provided in LCO 3.7.10. (9) If the channel/train cannot be restored to OPERABLE status, one CREFS train must be placed in the emergency radiation protection (pressurization) mode of operation. This accomplishes the actuation instrumentation Function and places the unit in a conservative mode of operation.

The Required Action for Condition A is modified by a Note that requires placing one CREFS train in the toxic gas protection mode instead of the [radiation protection] mode of operation if the automatic transfer to toxic gas protection mode is inoperable. This ensures the CREFS train is placed in the most conservative mode of operation relative to the OPERABILITY of the associated actuation instrumentation. (115)

(continued)

Supplement 4

(1)

BASES

ACTIONS (continued)

B.1.1 and B.1.2, and B.2

Condition B applies to the failure of two CREFS actuation trains, two radiation monitor channels, or two manual channels. The first Required Action is to place one CREFS train in the emergency [radiation protection] mode of operation immediately. This accomplishes the actuation instrumentation Function that may have been lost and places the unit in a conservative mode of operation. The applicable Conditions and Required Actions of LCO 3.7.10 must also be entered for the CREFS train made inoperable by the inoperable actuation instrumentation. This ensures appropriate limits are placed upon train inoperability as discussed in the Bases for LCO 3.7.10. (110) (9)

or the

pressurization

Alternatively, both trains may be placed in the emergency [radiation protection] mode. This ensures the CREFS function is performed even in the presence of a single failure. (116)

INSERT B 3.3.7-4

The Required Action for Condition B is modified by a Note that requires placing one CREFS train in the toxic gas protection mode instead of the [radiation protection] mode of operation if the automatic transfer to toxic gas protection mode is inoperable. This ensures the CREFS train is placed in the most conservative mode of operation relative to the OPERABILITY of the associated actuation instrumentation. (115)

C.1 and C.2

Condition C applies when the Required Action and associated Completion Time for Condition A or B have not been met and the unit is in MODE 1, 2, 3, or 4. The unit must be brought to a MODE in which the LCO requirements are not applicable. To achieve this status, the unit must be brought to MODE 3 within 6 hours and MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

(continued)

ITS Insert B 3.3.7-4 (CREFS Actuation Instrumentation)

Alternatively, the radiation monitoring channel may be placed in the trip condition. This action will start the preferred CREFS train in the emergency pressurization mode, and line up the redundant CREFS train in a stand-by mode, such that it will start in the emergency pressurization mode upon failure of the operating CREFS train. As noted (Note to Required Action B.2), the option to place the radiation monitoring channel in trip is not applicable to the automatic actuation trains.

BASES

①

SURVEILLANCE REQUIREMENTS

SR 3.3.7.1 (continued)

including indication and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

110

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.7.2

radiation monitor 110

the

A COT is performed once every 92 days on each required channel to ensure the entire channel will perform the intended function. This test verifies the capability of the instrumentation to provide the CREFS actuation. The setpoints shall be left consistent with the unit specific calibration procedure tolerance. The Frequency is based on the known reliability of the monitoring equipment and has been shown to be acceptable through operating experience.

should

SR 3.3.7.3

test

of both CREFS trains

SR 3.3.7.3 is the performance of an ACTUATION LOGIC TEST. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is pulse tested for continuity. This verifies that the logic modules are OPERABLE and there is an intact voltage signal path to the master relay coils. This test is performed every 31 days on a STAGGERED TEST BASIS. The Frequency is justified in WCAP-10271-P-A, Supplement 2, Rev. 1 (Ref. 1).

108

SR 3.3.7.4

INSERT B 3.3.7-5

SR 3.3.7.4 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay, verifying contact operation and a low voltage continuity

108

(continued)

Supplement 4

The master relay is actuated by either a manual or automatic initiation of the function being tested. Contact operation is verified either by a continuity check of the circuit containing the master relay or proper operation of the end device during the supported equipment simulated or actual automatic actuation test. This test is performed every 18 months. The 18 month Frequency is adequate, based on industry operating experience, and is consistent with the typical refueling cycle, which provides the plant conditions necessary for testing.

BASES

1

SURVEILLANCE REQUIREMENTS

SR 3.3.7.4 (continued)

check of the slave relay coil. Upon master relay contact operation, a low voltage is injected to the slave relay coil. This voltage is insufficient to pick up the slave relay, but large enough to demonstrate signal path continuity. This test is performed every 31 days on a STAGGERED TEST BASIS. The Frequency is acceptable based on instrument reliability and industry operating experience.

108

SR 3.3.7.5

SR 3.3.7.5 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified in one of two ways. Actuation equipment that may be operated in the design mitigation MODE is either allowed to function or is placed in a condition where the relay contact operation can be verified without operation of the equipment. Actuation equipment that may not be operated in the design mitigation MODE is prevented from operation by the SLAVE RELAY TEST circuit. For this latter case, contact operation is verified by a continuity check of the circuit containing the slave relay. This test is performed every [92] days. The Frequency is acceptable based on instrument reliability and industry operating experience.

INSERT B 3.3.7-6

110

SR 3.3.7.6

SR 3.3.7.6 is the performance of a TADOT. This test is a check of the Manual Actuation Functions and is performed every [18] months. Each Manual Actuation Function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.).

The test also includes trip devices that provide actuation signals directly to the Solid State Protection System, bypassing the analog process control equipment. The Frequency is based on the known reliability of the Function and the redundancy available, and has been shown to be acceptable through operating experience. The SR is modified by a Note that excludes verification of setpoints during the

(continued)

Supplement 4

... either by a continuity check of the circuit containing the slave relay, or by verification of proper operation of the end device during supported equipment simulated or actual automatic actuation test. This test is performed every 18 months. The 18 month Frequency is adequate, based on industry operating experience, and is consistent with the typical refueling cycle, which provides the plant conditions necessary for testing.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.7.6 (continued)

TADOT. The Functions tested have no setpoints associated with them.

(1) (110)

SR 3.3.7.8 (6)

A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

The Frequency is based on operating experience and is consistent with the typical industry refueling cycle.

REFERENCES

None. 1. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.

INSERT B 3.3.8-1 (76)

SURVEILLANCE REQUIREMENTS

SR 3.3.8.2 (continued)

within the tolerances and Allowable Values specified in Table 3.3.8-1.

The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology. The setpoint must be left set consistent with the assumptions of the setpoint methodology.

The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis in Reference 3 when applicable.

The Frequency of 92 days is justified in Reference 3.

SR 3.3.8.3

SR 3.3.8.3 is the performance of a TADOT. This test is a check of AFW pump automatic start on loss of offsite power, undervoltage RCP, and trip of all MFW pumps Functions. It is performed every 18 months. Each applicable Actuation Function is tested up to, and including, the end device start circuitry. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.). As noted, this SR requires the injection of a simulated or actual signal for the Trip of Main Feedwater Pumps Function. The injection of the signal should be as close to the sensor as possible. The Frequency is adequate, based on industry operating experience and is consistent with the typical refueling cycle.

SR 3.3.8.4

SR 3.3.8.4 is the performance of a CHANNEL CALIBRATION. A CHANNEL CALIBRATION is performed every 18 months, or

1 In the conversion of the HBRSEP current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes which involve the insertion of plant specific terms or parameters are used to preserve consistency with the CTS and licensing basis.

2 Bases 3.3.1 are modified to reflect a title change from "Reactor Trip System (RTS)," to "Reactor Protection System (RPS)," to be consistent with plant terminology and original licensing basis. Reference to the Specification title are modified throughout, accordingly.

3 Bases 3.3.1 and 3.3.2 are modified to reflect that the plant design basis does not include a Solid State Protection System (SSPS), as described in NUREG-1431, but instead is equipped with Reactor Protection System (RPS) and Engineered Safety Features Actuation System (ESFAS) relay logic, which is the analog equivalent to SSPS.

4 Reactor trip and engineered safety features instrumentation systems were designed in accordance with IEEE-279-1968, which did not stipulate specific logic matrices for functions where a channel is shared by control and protection. Therefore, design of the instrumentation systems does not provide 2 out of 4 logic in all cases where a channel is shared by both control and protection. In addition, when a 2 out of 4 logic is provided, it is not necessarily for the purpose of reducing and protecting against control-protection interactions. IEEE-279-1968 does specify (in Section 4.7) that the RPS meet single failure criteria when a channel feeding control circuits is inoperable in a non-conservative state.

5 Plant design is such that logic channels must be removed from service for testing and maintenance.

6 Trip Setpoints and Allowable Values are determined in accordance with the company setpoint methodology procedure. This procedure is based on NRC approved setpoint methodologies.

7 The term "bistable" is changed to "channel" to clarify the subpart of the function that would be inoperable. In the performance of the COT, any piece of signal process equipment which makes up a channel may render the channel inoperable, not just the bistable.

8 RPS and ESFAS are separate entities with respect to actuation logic. The RPS does not actuate the ESFAS. References to any interdependence between the two is deleted from the Bases for RTS Instrumentation.

9 Plant design basis does not include a semi-automatic testing device.

Testing is performed by removing each train from service, one at a time. Train logic is tested manually, using test switches provided in the reactor protection cabinets. When one train is out of service, the opposite train is relied upon to initiate a reactor trip upon receipt of a reactor trip signal.

10 The manual reactor trip, safety injection, steam line isolation, and containment spray actuating devices are push-buttons. Manual actuation of the reactor trip or safety injection requires depressing either of the installed push buttons for Safety Injection (SI) or RPS. Manual initiation of containment spray requires depressing both of the actuation buttons for this function simultaneously. This change reflects the actual plant hardware configuration.

11 Many parameters in the plant are monitored which have "Trip Setpoints" that are not ESFAS or RPS inputs. The term, "RPS or Engineered Safety Features Actuation System (ESFAS)," is added to clarify which approaching Trip Setpoints the reactor operator is likely to react to by initiating a manual reactor trip.

12 Bases presentation are modified to explain that manual reactor trip or applicable automatic reactor trip functions cannot be inoperable simply because the control rods are not capable of withdrawal. When the reactor trip breakers are closed and shutdown bank(s) are withdrawn, then these rods are credited as part of the shutdown margin. Because they are credited in the shutdown margin as being "trippable," it follows that those functions necessary for manual or automatic tripping of the reactor be operable, regardless of whether the rods are capable of being withdrawn. While the continuous rod withdrawal accident is one reactivity transient of concern during MODES 3, 4, and 5, the steam line break, rod ejection, and boron dilution accidents are also mitigated by the RPS when shutdown or control banks are withdrawn. As such, it is prudent to maintain the manual and applicable automatic trips (e.g., source range high flux trip) operable when the reactor trip breakers are closed in MODES 3, 4, and 5, regardless of control rod withdrawal capability.

13 The Nuclear Instrumentation System does not provide input to the steam generator water level control system. Therefore, this term is replaced with "Turbine Control System," since the power range instruments do provide input to the automatic runback circuitry for the turbine.

14 The Nuclear Instrumentation System does not provide a "High Positive Rate" or "High Negative Rate" trip signal to the RPS. Therefore, this section and all references to these functions are deleted from the Bases. Subsequent sections are renumbered accordingly.

15 During normal plant cooldown from MODE 3 to MODE 5 or heatup from MODE 5

to MODE 3, the control rods are withdrawn to approximately 5 steps in order to prevent thermal binding of the rods in the dash-pots at the bottom of the rod guides. The same applies the shutdown rods, which may be fully withdrawn, but must be at a minimum of 5 steps withdrawn during cooldown or heatup to prevent thermal binding. This change reflects normal operating practice.

16 Plant design does not include a Boron Dilution Protection System (BDPS). Therefore, all reference to a BDPS, including NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," (i.e., ISTS) Specification 3.3.9, are deleted from the Bases. Instead, the source range nuclear instruments are provided with a "high flux at shutdown alarm," which is normally set to alarm if the flux count trebles from the baseline count established with all rods inserted.

17 The temperature inputs to the OPΔT and OTΔT are derived from resistance temperature detectors (RTDs) located in thermowells in the hot and cold legs (no bypass lines) of the three reactor coolant loops. Because these detectors are located in wells, a thermal gradient exists between the actual detector and the coolant when the coolant temperature is changing. This gradient presents the system with a delayed response time constant. Dynamic compensation for this delayed response is provided electronically in the OPΔT and OTΔT circuitry as derivative lead units. These units provide a gain of greater than unity when the input is dynamic, thus offsetting the lag imposed by the thermowell mounted RTD.

18 Generic information, not related to HBRSEP, is deleted from the Bases. Plant specific details are added.

19 The OPΔT and OTΔT functions provide three inputs to a two out of three logic for the RPS. HBRSEP is a three loop unit, and therefore all references to four loop units are deleted.

20 Reference to "P-13" is deleted. Turbine impulse pressure input to P-7 is not referred to as P-13. The terminology is changed to "P-7 input," as appropriate.

21 The high pressure trip does not minimize challenges to the power operated relief valves (PORVs). The high pressure reactor trip is set at 2376 psig (nominal), and the PORVs are set at 2335 psig (nominal). Therefore, system design dictates that the PORVs actuate prior to the reactor trip setpoint being achieved in order to minimize plant transients.

22 Bases are modified to reflect two undervoltage relays provided per bus on two phases of the Reactor Coolant Pump (RCP) busses (4 kV busses 1, 2, and 4). One of the relays on each bus is used in a two-out-of-three

logic as an input to the RPS. These relays are shared by the steam driven auxiliary feedwater pump auto start function when an undervoltage condition is detected by both relays on busses 1 and 4 (two-out-of-two on each bus).

23 The RCP underfrequency trip does not provide a direct input to the RPS. The hardware provides one underfrequency relay per RCP bus. When an underfrequency condition is detected on two of the three RCP power supply busses, all three RCPs are tripped simultaneously. The RCP breakers, in turn, provide input to the RPS logic to actuate a reactor trip, if required.

24 Bases are modified to reflect that Main Feedwater (MFW) System is not used ONLY in MODES 1 and 2. It is used exclusively during reactor startups and shutdowns, and, in MODES 3, 4, and 5, it is often desirable to use the MFW System to provide feedwater to the steam generators from the main condenser, when available. The MFW System provides feedwater with reduced oxygen concentration as a result of deaeration in the main condenser.

25 Bases are modified to reflect that Steam Generator Low Level coincident with Steam/Feed Flow Mismatch does not generate an AFW auto start signal.

26 Bases is modified to reflect that turbine trip logic is interlocked with the P-7 permissive, not the P-9 permissive. The P-7 permissive provides a reactor trip when the turbine trips if reactor power is >10%, as indicated by the power range nuclear instruments, or >10% equivalent turbine load, as indicated by turbine first stage pressure. The turbine trip is detected by the RPS through the turbine stop valve closed limit switches or the turbine auto stop oil pressure switches. The stop valves require a two-out-of-two logic to indicate a turbine trip to the RPS. The auto stop oil pressure switches require a two-out-of-three logic to indicate a turbine trip to the RPS.

27 Bases are modified to reflect that a turbine trip can occur at less than 5% RTP (MODE 2). During unit startup, when the turbine is first brought up to synchronous speed, and prior to being electrically loaded, with reactor power at <5% RTP, it is possible for a turbine trip to occur.

28 Bases are modified to reflect that source range instrumentation is not equipped with a "doubling circuit," nor does the P-6 interlock provide an auto defeat for such a circuit.

29 The P-7 interlock does not disable the underfrequency trip of the RCPs. The underfrequency trip operates through the RCP "breaker open" function. The RCPs will still trip on an underfrequency condition below P-7, but the reactor will not trip because the RCP "breaker open"

function is interlocked with P-7. The underfrequency trip function is replaced with the turbine trip function on the list of Functions interlocked with P-7, because it is interlocked with P-7, not P-9. The P-9 interlock is not part of the plant design basis.

30 Bases are modified to specifically identify which nuclear instrumentation trips are interlocked with P-10. This change is made for clarification and to prevent confusion over which trips are interlocked with P-10.

31 The turbine generator may be operating at synchronous speed in MODE 2 during startup of the unit. Therefore, the statement is clarified by stating the turbine generator is not "electrically loaded."

32 The phrase "... and bypass breaker ..." is added to clarify that an RTS "train" is made up of a reactor trip breaker and a bypass breaker controlled by that train. When a bypass breaker is used instead of the normal reactor trip breaker, one train of reactor protection logic is relied upon to trip both breakers. Thus, a "train" normally consists of just its reactor trip breaker with the associated bypass breaker racked out or removed, however, when the bypass breaker is used, then the "train" consists of the reactor trip breaker AND the bypass breaker.

33 Bases is modified to reflect that RPS and ESFAS instrumentation inputs do not have the capability to be bypassed.

34 Typographical and/or grammatical error is corrected.

35 The phrase "... and performing a reactor startup ..." is deleted to clarify that the source range instruments are always required to be operable when the unit is in MODE 2, below the P-6 setpoint, not just during a reactor startup.

36 Bases are modified to agree with Note 2 in the Specification.

37 The P-9 interlock is not part of the plant design basis, and is not adopted in the ITS. The P-7 interlock is used to automatically activate and deactivate the high power trips.

38 The Overpower ΔT function is added to those functions applicable to SR 3.3.1.3 and SR 3.3.1.6, because the $f(\Delta I)$ penalty is applied in the algorithms which determine both the Overtemperature ΔT <u>and</u> the Overpower ΔT setpoints for the RPS.

39 Bases are modified to clarify that only those functions with electronic dynamic compensation should have their time constants adjusted to the prescribed values. Not all functions to which SR 3.3.1.10 is Applicable are equipped with dynamic compensation.

40 Bases for 18 month Frequency is modified to correct conflict with Bases for performance of intermediate range and power range channel calibrations at power.

41 Bases is modified to clarify that reactor trip bypass breakers are tripped by the RPS through the undervoltage coil only.

42 Bases is modified to reflect that response time testing of RPS and ESFAS circuitry is not performed, and is not required by current licensing basis. Therefore, ISTS Surveillance Requirements SR 3.3.1.16 and SR 3.3.2.10 are not adopted in the ITS.

43 ESFAS design does not include a "semi-automatic testing device." One train at a time is removed from service for testing by placing the train in the "test" condition (not a "bypass" condition). The train logic is tested manually through the test switches provided. When the train is out of service, the remaining train is relied upon to actuate its associated components in the event of an ESFAS initiation condition.

44 ESFAS design does not provide for on-line testing of Master and Slave Relays. The Master Relay coil is checked for continuity as part of the ACTUATION LOGIC TEST. Master and Slave Relay operational testing is performed at a Frequency of 18 months in accordance with ITS SR 3.3.2.8.

45 ESFAS does not directly initiate a Turbine Trip. The Turbine Trip is initiated through the RPS upon an ESFAS actuation.

46 The Control Room Ventilation System is automatically placed in the "pressurization" mode, not an "isolation" mode, upon initiation of SI, thereby supplying filtered outdoor air to the control room during accident situations for habitability requirements.

47 The Emergency Core Cooling System (ECCS) requires manual switchover to the containment sump for long term recirculation following a Loss of Coolant Accident (LOCA). ECCS design does not include automatic switchover capability.

48 Bases are modified to clarify that only those ESFAS initiating functions in Table 3.3.2-1 Applicable Modes or Other Specified Conditions are required to be OPERABLE in MODES 1 though 4 (some functions may be defeated when interlock or permissive conditions are met). Current licensing basis requires ESFAS to be OPERABLE in MODES 1, 2, 3, and 4.

49 Bases are modified to reflect three pressurizer pressure channels provide input to ESFAS actuation logic, and that these protection channels do not provide control functions.

50 References to the Pressurizer Pressure-Low interlock term, "P-11," and

the T_{avg}-Low interlock term, "P-12," are modified to reflect plant specific terminology. The purpose of the Pressurizer Pressure-Low interlock is to provide the capability to block the Pressurizer Pressure-Low and the High Differential Pressure Between Steam Header and Steam Lines Safety Injection initiation signals during a normal plant cooldown. Also note that T_{avg}-Low Low function is T_{avg}-Low at HBRSEP.

51 Certain ISTS Table 3.3.2-1 Functions and/or footnotes are not adopted in the ITS. Plant equipment is not capable of performing the particular ESFAS function, subfunction or footnote requirement(s), which are not in current licensing basis. Bases for these functions are also deleted, and subsequent sections renumbered accordingly.

52 Bases are modified to reflect that steam break protection for upstream of the main steam check valves is provided by the Steam Line Differential Pressure Between Steam Header and Steam Line function.

53 Bases are modified to reflect that pressure inputs to the Steam Header-Steam Line ΔP signal are used for control functions in the Steam Dump System and Steam Generator Water Level Control System. Same inputs are also used in RPS for derivation of the steam flow signal in the Steam Generator Water Level-Low Coincident with Steam Flow/Feedwater Flow Mismatch.

54 Bases are modified to reflect that the steam line and steam header pressure transmitters used by the RPS and ESFAS are located in the turbine building in a cabinet physically separated from the steam lines. As such, they are not likely to experience adverse operating environments during a steam line break (SLB) event.

55 Plant design basis requires that the Steam Header-Steam Line ΔP Safety Injection signal be defeated when Reactor Coolant System (RCS) pressure is less than the 2000 psig interlock setpoint, to prevent inadvertent actuation of the ESFAS during plant cooldowns. The steam header pressure signals are biased to 585 psig minimum. Therefore, when the RCS is cooled below approximately 462°F, which corresponds to 485 psig in the steam generators, the system would actuate on the 100 psig differential between the Steam Header and Steam Line, if not blocked.

56 The High Steam Flow in Two Steam Lines Coincident with Steam Line Pressure Low or T_{avg}-Low does not provide protection against the inadvertent opening of a steam generator relief (PORV) or safety valve. Because the relief and safety valves are located upstream of the main steam line check valves, the high flow signal would also have to be generated on one of the intact steam lines, in order to meet the logic requirements of the function. The safety valves are rated at 25% steam flow for one steam generator and the PORVs are rated at 17% steam flow for one steam generator. The resultant effect on the two intact steam

lines is a 12.5% increase in steam flow for an open safety valve and an 8.5% increase in steam flow for an open PORV, assuming a turbine steam demand exists. Because steam pressures are substantially lower at higher power levels, and slope of the high steam flow setpoint as a function of turbine load curve is greater, this function does not provide protection for inadvertent opening of a steam generator relief or safety valve.

57 The phrase, "one-out-of-one," is replaced with the term,"a," because the "one-out-of-one" concept conveys no logic matrix. This change merely simplifies the wording and improves the clarity of the paragraph by minimizing confusion.

58 Bases are modified to reflect that the steam line pressure channels do provide control inputs to the Steam Generator Water Level Control System and steam generator PORV controls.

59 Bases are modified to maintain consistency with respect to material incorporated in the Bases. Allowable Value details are provided in ITS Table 3.3.2-1 footnotes, and need not be repeated in the Bases.

60 The trip setpoint for Safety Injection - High Steam Flow in Two steam Generators Coincident with T_{avg} Low or Steam Line Pressure - Low does not reflect adverse environmental instrument uncertainties. The safety analyses for a SLB indicate that the trip occurs faster than the environmental effects from the SLB affect the transmitters.

61 A feed line break is of concern when the RCS is below 543°F. In this condition, the High Steam Flow in Two Steam Lines Coincident with T_{avg}-Low or Steam Line Pressure-Low function is defeated. However, the High Differential Pressure Between Steam Header and Steam Lines and the Containment Pressure High functions still provide protection for the feed line break. When the RCS pressure is lowered to below 2000 psig and the High Differential Pressure Between Steam Header and Steam Lines function is defeated, the reactor is in a shutdown MODE, and adequate time is available for initiation of appropriate compensatory measures.

62 When containment sump recirculation is in progress following a LOCA, the Residual Heat Removal (RHR) pumps are aligned to take suction from the containment sump. They, in turn, provide the suction source for the containment spray and safety injection pumps. The containment spray and safety injection pumps do not take direct suction from the containment sump.

63 Bases text is repetitive, and therefore, deleted.

64 The Containment Spray Manual Initiation function is different from the Containment Spray Automatic Initiation function. Manual Initiation does

not actuate Steam Line Isolation, but does actuate Containment Ventilation Isolation. Conversely, Automatic Initiation does actuate Steam Line Isolation, but does not actuate Containment Ventilation Isolation.

65 The Containment Pressure-High High bistables are the only bistables in ESFAS or RPS that are energized to actuate. Therefore, the phrase, "one of," is deleted to accurately reflect the hardware configuration.

66 Plant design does not provide for bypassing individual channel inputs to ESFAS. An inoperable channel must either be placed in trip, or the unit be placed in a MODE in which the automatic Function is not required. Therefore, the Bases information has been deleted to be consistent with the change to ITS 3.3.2 Condition E.

67 The Automatic Initiation circuitry for containment spray is comprised of six channels of containment pressure instruments, arranged in two sets of three. Automatic Initiation of containment spray requires that a high pressure condition be sensed by two of the three channels in each set. Bases is modified to reflect the plant specific design.

68 The Phase A Containment Isolation function isolates all automatically isolable process lines from containment except the cooling water to the RCPs and the seal water return from the RCPs. These process lines are automatically isolated by the Containment Isolation Phase B function.

69 Plant design does not include RCP air coolers.

70 Each Main Steam Isolation Valve (MSIV) is actuated by either train of ESFAS when a Steam Line Isolation is called for by the relay logic matrices. Three channels of manual Steam Line Isolation are provided. Each channel operates its associated MSIV when the pushbutton is depressed. This permits manual Steam Line Isolation of any steam line. The Main Steam System design does include check valves in the main steam lines.

71 The ESFAS channels utilized in Automatic Steam Line Isolation on a Containment Pressure-High High condition are the same channels used in Automatic Initiation of Containment Spray. Therefore, reference is provided to the Containment Pressure-High High function description in the Bases.

72 Feedwater Isolation initiated by the Safety Injection signal is the only Feedwater Isolation Function that is an Engineered Safety feature (ESF). References to other isolation Functions are deleted. The Safety Injection Feedwater Isolation prevents excessive feed rates to steam generators, which could result in excessive cooldown of the RCS, along with the associated detrimental reactivity effects.

73 The phrase, "initiates feedwater isolation," is deleted because it is redundant to the list of automatic actions that occur when a Feedwater Isolation is initiated. A Feedwater Isolation, as a result of a Safety Injection actuation, closes the MFIVs, MFRVs, bypass valves, and trips the main feedwater pumps.

74 Plant design does not include the reactor trip signal referred to by the term, "P-4." This change reflects the plant specific design and nomenclature, and all references to the "P-4" trip are deleted. Subsequent sections are renumbered accordingly.

75 Bases are modified to reflect plant design. A Safety Injection actuation sends a signal to the RPS to trip the reactor. The RPS then sends a signal to the turbine trip logic to trip the turbine.

76 The Auxiliary Feedwater (AFW) System, and all attendant instrumentation and hardware, are not considered to be an ESF. All instrumentation requirements for the AFW System are addressed in ITS Specification 3.3.8. The AFW functions are deleted from ITS Specification 3.3.2, and subsequent sections are renumbered accordingly.

77 ISTS 3.3.2, Required Actions C.1, D.1 and G.1 "Notes" are not adopted in the ITS. Plant design does not include the capability to bypass individual channel inputs to ESFAS initiation circuits. Only the entire Function can be bypassed. Therefore, a second "ACTIONS" Note is adopted to permit a single Function in a single train to be bypassed for up to 12 hours for surveillance testing of that Function. The Note also specifies that this provision does not apply to Manual Actuation Functions.

78 A new Condition I is added to ITS 3.3.2, applicable only to Manual Containment Spray pushbuttons. Under the conditions when one or more of the manual spray pushbuttons is inoperable, their is no means to manually initiate containment spray or Phase B Isolation through the automatic actuation relays. The Containment Spray/Phase B Manual Initiation is set up on two-out-of-two logic with only two pushbuttons provided. Therefore, a single failure of either of the buttons renders the entire manual initiation function inoperable. The Required Actions for Condition I provide 1 hour to restore the channel or train to OPERABLE status. If the channel is not returned to OPERABLE status within the 1 hour Completion Time, the unit must be placed in MODE 3 within the next 6 hours, in MODE 4 within the following 6 hours, and in MODE 5 within the following 24 hours.

79 The Automatic Actuation Logic for Phase A Isolation is provided by the SI Automatic Actuation Logic, and the Automatic Actuation Logic for Phase B Isolation is provided by the containment spray Automatic Actuation Logic. Therefore, all initiation functions and requirements

are addressed under safety injection and containment spray, respectively. Reference to the Phase A and Phase B functions here is redundant in this context.

80 Containment Pressure-High is Applicable in MODES 1, 2, 3, and 4 in the current licensing basis, and is addressed in Condition E, which provides Required Actions to place the unit in a MODE in which the Function is not Applicable. Phase B Isolation Containment Pressure-High High Automatic Actuation Logic is provided by the Containment Spray Automatic Actuation Logic, and therefore, all function requirements are addressed by the Containment Spray function requirements.

81 Certain ISTS Conditions, and their attendant Required Actions and Completion Times are not adopted in the ITS, since they are not compatible with the plant ESFAS design or current licensing basis. Subsequent Conditions are renumbered accordingly.

82 ISTS SR 3.3.2.3 is not adopted in the ITS because it is redundant to the requirements of ISTS SR 3.3.2.2 for ESFAS testing purposes. ITS Table 3.3.2-1 ACTUATION LOGIC TESTS are performed in accordance with ITS SR 3.3.2.2. Subsequent SRs are renumbered accordingly.

83 The Frequency for performing ITS Surveillance Requirements SR 3.3.2.3 and SR 3.3.2.5 are changed to 18 months. Plant equipment does not have the capability to perform on-line testing of the Master and Slave Relays. Master Relay coil continuity is tested as part of the ACTUATION LOGIC TEST, but that is the extent of on-line testing that can be performed routinely on these items. Therefore, the Master and Slave Relays are tested during the ESFAS equipment response to a test initiation signal in ITS SR 3.3.2.8, at a Frequency of 18 months.

84 The COT, as defined in NUREG-1431, does not include verification of proper operation of the "entire channel." Because the test signal is injected "downstream" of the transmitter, or sensor, this portion of the channel is not tested by the COT. Bases is modified to reflect this concept.

85 ISTS Surveillance Requirements SR 3.3.2.7 and SR 3.3.2.11 are not adopted in the ITS. All TADOTs required by ITS Table 3.3.2-1 are performed in accordance with ITS SR 3.3.2.6 at an 18 month Frequency. ISTS SR 3.3.2.7 is not adopted because plant equipment does not have the capability for performance of on-line TADOT testing. ISTS SR 3.3.2.11 is not adopted because the P-4 interlock is not a part of the plant design. Subsequent SRs are renumbered accordingly.

86 Reference to the ITS SR 3.3.2.7 "Note" is deleted. None of the applicable functions listed in ITS Table 3.3.2-1 have dynamic compensation electronic time constants associated with them and

therefore, the NOTE is unnecessary.

87 Not used.

88 The PORVs, PORV Block valves, and the pressurizer safety valves are retained in ITS Table 3.3.3-1 with OPERABILITY requirements for the single channel primary position indicator on each valve. These Functions are retained because they were determined to be risk-significant in the plant PRA.

89 Bases 3.3.3 are modified by deleting reference to the RCS T_{hot} and T_{cold} Post Accident Monitoring (PAM) variables providing inputs to the RPS. The PAM instrumentation consists of 1 dedicated RCS wide range T_{hot} and T_{cold} thermocouple per loop, that serve no other function.

90 Reactor Vessel Water Level is not a Type A or Category 1 variable in the HBRSEP Regulatory Guide 1.97 analysis. This parameter is replaced with Refueling Water Storage Tank Level, Steam Generator Pressure, and Containment Spray Additive Tank Level, all of which are Type A Regulatory Guide 1.97 parameters.

91 Bases 3.3.3 are modified to reflect that the PAM containment pressure parameter is used to provide indication of whether the overall containment cooling function provided by containment spray and fan coolers is being achieved, and to verify the Containment Pressure-High and Containment Pressure-High High signals.

92 Bases 3.3.3 are modified to identify that the Steam Generator (SG) narrow range water level signal is input to SG water level control and the RPS, and that the plant design does not include an Emergency Feedwater Control System.

93 A new Condition D is incorporated and a Note added to Condition A to address inoperability of PAM Functions with only one channel associated with the Function. This change is consistent with current licensing basis.

94 Plant design does not include a "remote shutdown panel." Remote shutdown activities are conducted from various locations throughout the plant, according to procedures.

95 Plant was designed and licensed prior to codification of the 10 CFR 50, Appendix A, General Design Criteria.

96 Bases are modified to eliminate reference to Table 3.3.4-1 indicating that required information or control capability is available from several alternate sources. This level of detail will be retained in plant procedures.

97 The term, "facility" is changed to "unit," to maintain consistency of use throughout NUREG-1431.

98 Plant design includes 480 VAC emergency power systems. There are no 4.16 kV emergency power systems.

99 The loss of voltage function has two channels per bus, with a one-out-of-two logic; and the degraded voltage function has three channels per bus, with a two-out-of-three logic.

100 Current licensing basis identifies loss of voltage and degraded voltage relay dropout settings as trip setpoints (± tolerances) and associated time delays. Reference to Allowable Values is deleted, and reference to time delays is added.

101 The phrase, "For example," is added to clarify that the scenario discussed is but one "example" of why the LCO is needed.

102 A NOTE is added to the Applicability which permits blocking the degraded voltage function when starting RCPs in all MODES except MODE 1. This is consistent with current licensing basis.

103 A new Condition A is added specifically to address the Loss of Voltage Function, which is a two channel per bus arrangement, with one-out-of-one logic (either channel can trip the bus). One or more inoperable Loss of Voltage channels must be restored to OPERABLE status, since placing an inoperable channel in "trip" would trip the bus. ISTS Condition A is renumbered as Condition B and modified to address the Degraded Voltage Function. Subsequent Conditions are renumbered and revised accordingly.

104 Not used.

105 ISTS Surveillance Requirement SR 3.3.5.1 is not adopted in the ITS, because it is not part of the current licensing basis. Subsequent SRs are renumbered accordingly.

106 The term, "shall," is replaced with the term, "should," as a more proper term for use in the Bases.

107 Consistent with current licensing basis, the 42-inch Containment Purge Supply and Exhaust Isolation Valves may be opened during reactor operation for safety related reasons, including operational testing and surveillance.

108 Plant design is such that the Automatic Actuation Logic Relays Function for Containment Ventilation Isolation is part of, and is tested with, the Safety Injection Automatic Actuation Function, in LCO 3.3.2.

Consequently, the Bases of the ISTS Surveillance Requirements, are modified to reflect the same Bases of the ITS 3.3.2 SRs. Subsequent SRs are renumbered accordingly.

109 Not used.

110 The Bases associated with ITS Specifications are modified to reflect changes made to ITS Specifications.

111 HBRSEP undervoltage relays utilize definite time characteristics.

112 Bases describing the function of the COT are modified in presentation for clarity.

113 Bases 3.3.7 are modified to reflect that LCO is not Applicable in MODE 5 and MODE 6, but rather during CORE ALTERATIONS and movement of irradiated fuel assemblies.

114 Not used.

115 Plant design does not include a toxic gas protection mode of operation for the CREFS.

116 Bases 3.3.7 are modified in Required Action B.2 to permit placing an inoperable R-1 radiation monitor in trip as an alternative to the other Required Actions. Plant design is such that both CREFS trains cannot be operated simultaneously, since active components (e.g., fans, dampers) are redundant, but passive components (e.g., ductwork) are not. Placing the R-1 radiation monitor in trip, however, will cause the preferred CREFS train to start in the emergency pressurization mode, and line up the redundant CREFS train in a stand-by mode, such that it will start in the emergency pressurization mode upon failure of the operating train.

117 ISTS Specification 3.3.8 is not adopted in the ITS. The Fuel Handling Building Ventilation System design does not include any manual or automatic actuation logic. The system is manually energized, under administrative control.

118 The Remote Shutdown System Table (ISTS Table 3.3.4-1) is relocated from HBRSEP Unit No. 2 ITS 3.3.4 to the HBRSEP Unit No. 2 ITS Bases (ITS Table B 3.3.4-1). This change is consistent with the provisions of Generic Letter 91-08 for the removal of lists and has been approved for Clinton Power Station (Amendment 68) on that basis.

119 The Functions in ISTS Table 3.3.4-1, Remote Shutdown System Instrumentation and Controls, are revised to reflect the HBRSEP Unit No. 2 current licensing basis (as identified in UFSAR Section 7.4.1.1 and Table 9.5.1.C-2) associated with the capability to place and

maintain the plant in Hot Shutdown from outside the control room. The ITS Table B 3.3.4-1 includes the following exceptions to Remote Shutdown System Functions discussed in the UFSAR:

> The Boric Acid Transfer Pump Control Function is satisfied by the Charging Pump Controls and RWST Level Functions since the boric acid transfer pump requirements are to be relocated from the Technical Specifications during the implementation of the ITS at HBRSEP Unit No. 2. The functions are considered to be equivalent for the purposes of satisfying the Remote Shutdown Function based on a comparison of UFSAR Section 7.4.1.1 and Table 9.5.1.C-2.

120 ISTS Table 3.3.4-1 (ITS Table B 3.3.4-1) is revised to add Footnote (a), "This Function is local indication and manual trip feature at the breaker and applies to Reactor Trip Breakers and Reactor Bypass Breakers that are racked in," to ISTS Table 3.3.4-1, Items 1.b. and 1.c., Reactor Trip Breaker Position and Manual Reactor Trip. This note modifies Applicability requirements similar to the manner in which the Notes associated with bypasses and interlock modify Applicabilities in ISTS LCO 3.3.1, Reactor Trip System Instrumentation, and LCO 3.3.2, Engineered Safety Features Actuation System Instrumentation. This note is provided since these two Functions in the HBRSEP Unit No. 2 design are satisfied by local indication and the manual trip feature at the breaker. As such, if the associated breaker is not racked in, local indication and manual trip capability are not available for that breaker. However, with the breaker not racked in, the Reactor Protection System cannot be energized through this breaker and the need to monitor the status of this breaker for reactivity control purposes is not required.

121 The Applicability in the Bases for various ITS Table 3.3.2-1 Functions is modified to reflect the change to ITS Table 3.3.2-1.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
Q. One train inoperable.	------------NOTE------------ One train may be bypassed for up to 12 hours provided the other train is OPERABLE. ----------------------------	
	Q.1 Restore train to OPERABLE status.	6 hours
	OR	
	Q.2 Be in MODE 3.	12 hours
R. One RTB train inoperable.	------------NOTE------------ One train may be bypassed for up to 12 hours, provided the other train is OPERABLE. ----------------------------	
	R.1 Restore train to OPERABLE status.	1 hour
	OR	
	R.2 Be in MODE 3.	7 hours

(continued)

SURVEILLANCE REQUIREMENTS

------------------------------------NOTE------------------------------------
Refer to Table 3.3.1-1 to determine which SRs apply for each RPS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.1.2	------------------NOTES------------------ 1. Adjust NIS channel if absolute difference is > 2%. 2. Not required to be performed until 12 hours after THERMAL POWER is ≥ 15% RTP. -- Compare results of calorimetric heat balance calculation to Nuclear Instrumentation System (NIS) channel output.	24 hours
SR 3.3.1.3	------------------NOTES------------------ 1. Adjust NIS channel if absolute difference is ≥ 3%. 2. Not required to be performed until 36 hours after THERMAL POWER is ≥ 15% RTP. -- Compare results of the incore detector measurements to NIS AFD.	31 effective full power days (EFPD)

(continued)

Table 3.3.1-1 (page 1 of 7)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
1. Manual Reactor Trip	1,2	2	B	SR 3.3.1.14	NA	NA
	3(a), 4(a), 5(a)	2	C	SR 3.3.1.14	NA	NA
2. Power Range Neutron Flux						
a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.11	≤ 110.93% RTP	≤ 108% RTP
b. Low	1(b),2	4	E	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 26.93% RTP	≤ 24% RTP
3. Intermediate Range Neutron Flux	1(b), 2(c)	2	F,G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 34.17% RTP	≤ 25% RTP
	2(d)	2	H	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 34.17% RTP	≤ 25% RTP
4. Source Range Neutron Flux	2(d)	2	I,J	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 1.28 E5 cps	≤ 1.0 E5 cps
	3(a), 4(a), 5(a)	2	J,K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.11	≤ 1.28 E5 cps	≤ 1.0 E5 cps
	3(e), 4(e), 5(e)	1	L	SR 3.3.1.1 SR 3.3.1.11	N/A	N/A

(continued)

(a) With Reactor Trip Breakers (RTBs) closed and rods not fully inserted or Rod Control System capable of rod withdrawal.
(b) Below the P-10 (Power Range Neutron Flux) interlock.
(c) Above the P-6 (Intermediate Range Neutron Flux) interlock.
(d) Below the P-6 (Intermediate Range Neutron Flux) interlock.
(e) With the RTBs open. In this condition, source range Function does not provide reactor trip but does provide indication and alarm.

Table 3.3.1-1 (page 2 of 7)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
5. Overtemperature ΔT	1,2	3	E	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.12	Refer to Note 1 (Page 3.3-18)	Refer to Note 1 (Page 3.3-18)
6. Overpower ΔT	1,2	3	E	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.12	Refer to Note 2 (Page 3.3-19)	Refer to Note 2 (Page 3.3-19)
7. Pressurizer Pressure						
a. Low	1(f)	3	M	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≥ 1832.02 psig	≥ 1844 psig
b. High	1,2	3	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≤ 2381.11 psig	≤ 2376 psig
8. Pressurizer Water Level – High	1(f)	3	M	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≤ 91.64%	≤ 91%

(continued)

(f) Above the P-7 (Low Power Reactor Trips Block) interlock.

Table 3.3.1-1 (page 3 of 7)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
9. Reactor Coolant Flow - Low						
a. Single Loop	$1^{(g)}$	3 per loop	N	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≥ 90.48%	≥ 91%
b. Two Loops	$1^{(h)}$	3 per loop	M	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≥ 90.48%	≥ 91%
10. Reactor Coolant Pump (RCP) Breaker Position						
a. Single Loop	$1^{(g)}$	1 per RCP	O	SR 3.3.1.14	NA	NA
b. Two Loops	$1^{(h)}$	1 per RCP	M	SR 3.3.1.14	NA	NA
11. Undervoltage RCPs	$1^{(f)}$	1 per bus	M	SR 3.3.1.9 SR 3.3.1.10	≥ 2959 V	≥ 3120 V
12. Underfrequency RCPs	$1^{(f)}$	1 per bus	M	SR 3.3.1.10 SR 3.3.1.14	≥ 57.84 Hz	≥ 58.2 Hz
13. Steam Generator (SG) Water Level - Low Low	1,2	3 per SG	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≥ 15.36%	≥ 16%

(continued)

(f) Above the P-7 (Low Power Reactor Trips Block) interlock.
(g) Above the P-8 (Power Range Neutron Flux) interlock.
(h) Above the P-7 (Low Power Reactor Trips Block) interlock and below the P-8 (Power Range Neutron Flux) interlock.

Table 3.3.1-1 (page 4 of 7)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
14. SG Water Level - Low	1,2	2 per SG	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≥ 29.36%	≥ 30%
Coincident with Steam Flow/ Feedwater Flow Mismatch	1,2	2 per SG	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≤ 7.06 E5 lbm/hr	≤ 6.4 E5 lbm/hr
15. Turbine Trip						
a. Low Auto Stop Oil Pressure	1(f)	3	P	SR 3.3.1.10 SR 3.3.1.15	≥ 40.87 psig	≥ 45 psig
b. Turbine Stop Valve Closure	1(f)	2	P	SR 3.3.1.15	NA	NA
16. Safety Injection (SI) Input from Engineered Safety Feature Actuation System (ESFAS)	1,2	2 trains	Q	SR 3.3.1.14	NA	NA

(continued)

(f) Above the P-7 (Low Power Reactor Trips Block) interlock.

Table 3.3.1-1 (page 5 of 7)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
17. Reactor Protection System Interlocks						
a. Intermediate Range Neutron Flux, P-6	2[(d)]	2	S	SR 3.3.1.11 SR 3.3.1.13	≥ 7.16 E-11 amp	≥ 1 E-10 amp
b. Low Power Reactor Trips Block, P-7	1	1 per train	T	SR 3.3.1.13 SR 3.3.1.14	NA	NA
c. Power Range Neutron Flux, P-8	1	4	T	SR 3.3.1.11 SR 3.3.1.13	≤ 42.94% RTP	≤ 40% RTP
d. Power Range Neutron Flux, P-10	1,2	4	S	SR 3.3.1.11 SR 3.3.1.13	≥ 7.06% RTP and ≤ 12.94% RTP	≥ 10% RTP
e. Turbine Impulse Pressure, P-7 input	1	2	T	SR 3.3.1.1 SR 3.3.1.10 SR 3.3.1.13	≤ 10.71% turbine power	≤ 10% turbine power
18. Reactor Trip Breakers[(i)]	1,2	2 trains	R,V	SR 3.3.1.4	NA	NA
	3[(a)], 4[(a)], 5[(a)]	2 trains	C,V	SR 3.3.1.4	NA	NA
19. Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms	1,2	1 each per RTB	U	SR 3.3.1.4	NA	NA
	3[(a)], 4[(a)], 5[(a)]	1 each per RTB	C	SR 3.3.1.4	NA	NA
20. Automatic Trip Logic	1,2	2 trains	Q,V	SR 3.3.1.5	NA	NA
	3[(a)], 4[(a)], 5[(a)]	2 trains	C,V	SR 3.3.1.5	NA	NA

(a) With Reactor Trip Breakers (RTBs) closed and rods not fully inserted or Rod Control System capable of rod withdrawal.
(d) Below the P-6 (Intermediate Range Neutron Flux) interlock.
(i) Including any reactor trip bypass breakers that are racked in and closed for bypassing an RTB.

Table 3.3.1-1 (page 6 of 7)
Reactor Protection System Instrumentation

Note 1: Overtemperature ΔT

The Overtemperature ΔT Function Allowable Value shall not exceed the following Trip Setpoint by more than 2.96% of ΔT span.

$$\Delta T_{setpoint} \le \Delta T_0 \left\{ K_1 - K_2 \frac{(1+\tau_1 S)}{(1+\tau_2 S)}(T - T') + K_3(P - P') - f(\Delta I) \right\}$$

Where: ΔT_0 is the indicated ΔT at RTP, °F.
s is the Laplace transform operator, sec^{-1}.
T is the measured RCS average temperature, °F.
T' is the reference T_{avg} at RTP, ≤ 575.4°F.

P is the measured pressurizer pressure, psig
P' is the nominal RCS operating pressure, ≤ 2235 psig

$K_1 \le 1.1265$ $K_2 = 0.01228/°F$ $K_3 = 0.00089/psig$
$\tau_1 \ge 20.08$ sec $\tau_2 \le 3.08$ sec

f(ΔI) =	$2.4(q_b - q_t) - 17$	when $q_t - q_b < -17\%$ RTP
	0% of RTP	when -17% RTP $\le q_t - q_b \le 12\%$ RTP
	$2.4(q_t - q_b) - 12$	when $q_t - q_b > 12\%$ RTP

Where q_t and q_b are percent RTP in the upper and lower halves of the core, respectively, and $q_t + q_b$ is the total THERMAL POWER in percent RTP.

Table 3.3.1-1 (page 7 of 7)
Reactor Protection System Instrumentation

Note 2: Overpower ΔT

The Overpower ΔT Function Allowable Value shall not exceed the following Trip Setpoint by more than 3.17% of ΔT span.

$$\Delta T_{setpoint} \leq \Delta T_0 \left\{ K_4 - K_5 \left[\frac{\tau_3 S}{1 + \tau_3 S} \right] T - K_6 (T - T') - f(\Delta I) \right\}$$

Where: ΔT_0 is the indicated ΔT at RTP, °F.
s is the Laplace transform operator, sec^{-1}.
T is the measured RCS average temperature, °F.
T' is the reference T_{avg} at RTP, ≤ 575.4°F.

$K_4 \leq 1.06$

$K_5 \geq 0.02/°F$ for increasing T_{avg}
0/°F for decreasing T_{avg}

$K_6 \geq 0.00277/°F$ when T > T'
0/°F when T ≤ T'

$\tau_3 \geq 9$ sec

$f(\Delta I)$ = as defined in Note 1 for Overtemperature ΔT

3.3 INSTRUMENTATION

3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

LCO 3.3.2 The ESFAS instrumentation for each Function in Table 3.3.2-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.2-1.

ACTIONS

-----------------------------------NOTE-----------------------------------

1. Separate Condition entry is allowed for each Function.

2. A single train may be inoperable for the purpose of maintenance for up to 12 hours provided the redundant train is OPERABLE. This NOTE does not apply to Manual Actuation Functions.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels or trains inoperable.	A.1 Enter the Condition referenced in Table 3.3.2-1 for the channel(s) or train(s).	Immediately
B. One channel or train inoperable.	B.1 Restore channel or train to OPERABLE status.	48 hours
	<u>OR</u>	
	B.2.1 Be in MODE 3.	54 hours
	<u>AND</u>	
	B.2.2 Be in MODE 5.	84 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One train inoperable.	C.1 Restore train to OPERABLE status.	6 hours
	OR	
	C.2.1 Be in MODE 3.	12 hours
	AND	
	C.2.2 Be in MODE 5.	42 hours
D. One channel inoperable.	D.1 Place channel in trip.	6 hours
	OR	
	D.2.1 Be in MODE 3.	12 hours
	AND	
	D.2.2 Be in MODE 4.	18 hours
E. One Containment Pressure channel inoperable.	E.1 Place channel in trip.	6 hours
	OR	
	E.2.1 Be in MODE 3.	12 hours
	AND	
	E.2.2 Be in MODE 4.	18 hours
	AND	
	E.2.3 Be in MODE 5.	42 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One channel or train inoperable.	F.1 Restore channel or train to OPERABLE status.	48 hours
	<u>OR</u>	
	F.2.1 Be in MODE 3.	54 hours
	<u>AND</u>	
	F.2.2 Be in MODE 4.	60 hours
G. One train inoperable.	G.1 Restore train to OPERABLE status.	6 hours
	<u>OR</u>	
	G.2.1 Be in MODE 3.	12 hours
	<u>AND</u>	
	G.2.2 Be in MODE 4.	18 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. One channel inoperable.	H.1 Verify interlock is in required state for existing unit condition.	1 hour
	OR	
	H.2.1 Be in MODE 3.	7 hours
	AND	
	H.2.2 Be in MODE 4.	13 hours
I. One train inoperable	I.1 Restore train to OPERABLE status.	1 hour
	OR	
	I.2.1 Be in MODE 3	7 hours
	AND	
	I.2.2 Be in MODE 4	13 hours
	AND	
	I.2.3 Be in MODE 5	37 hours

SURVEILLANCE REQUIREMENTS

------------------------------------NOTES------------------------------------

1. Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.

2. When a channel or train is placed in an inoperable status solely for the performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the redundant train is OPERABLE.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.2.2	Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.2.3	Perform MASTER RELAY TEST.	18 months
SR 3.3.2.4	Perform COT.	92 days
SR 3.3.2.5	Perform SLAVE RELAY TEST.	18 months
SR 3.3.2.6	------------------NOTE------------------ Verification of setpoint not required for manual initiation functions. --- Perform TADOT.	18 months
SR 3.3.2.7	Perform CHANNEL CALIBRATION.	18 months

Table 3.3.2-1 (page 1 of 4)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
1. Safety Injection						
a. Manual Initiation	1,2,3,4	2	B	SR 3.3.2.6	NA	NA
b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.3 SR 3.3.2.5	NA	NA
c. Containment Pressure - High	1,2,3,4	3	E	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≤ 4.45 psig	≤ 4 psig
d. Pressurizer Pressure - Low	1,2,3(a)	3	D	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≥ 1709.89 psig	≥ 1715 psig
e. Steam Line High Differential Pressure Between Steam Header and Steam Lines	1,2,3(a)	3 per steam line	D	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≤ 108.95 psig	≤ 100 psig
f. High Steam Flow in Two Steam Lines	1,2(c),3(c)	2 per steam line	D	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	(d)	(e)
Coincident with T_{avg} - Low	1,2(c),3(c)	1 per loop	D	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≥ 541.50 °F	≥ 543°F
g. High Steam Flow in Two Steam Lines	1,2(c),3(c)	2 per steam line	D	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	(d)	(e)
Coincident with Steam Line Pressure - Low	1,2(c),3(c)	1 per loop	D	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≥ 605.05 psig	≥ 614 psig

(continued)

(a) Above the Pressurizer Pressure interlock.
(c) Above the T_{avg}-Low interlock.
(d) Less than or equal to a function defined as ΔP corresponding to 41.58% full steam flow below 20% load, and ΔP increasing linearly from 41.58% full steam flow at 20% load to 110.5% full steam flow at 100% load, and ΔP corresponding to 110.5% full steam flow above 100% load.
(e) Less than or equal to a function defined as ΔP corresponding to 37.25% full steam flow between 0% and 20% load and then a ΔP increasing linearly from 37.25% steam flow at 20% load to 109% full steam flow at 100% load.

Table 3.3.2-1 (page 2 of 4)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
2. Containment Spray						
a. Manual Initiation	1,2,3,4	2 trains	I	SR 3.3.2.6	NA	NA
b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.3 SR 3.3.2.5	NA	NA
c. Containment Pressure						
High High	1,2,3,4	6 (2 sets of 3)	E	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≤ 20.45 psig	≤ 20 psig
3. Containment Isolation						
a. Phase A Isolation						
(1) Manual Initiation	1,2,3,4	2	B	SR 3.3.2.6	NA	NA
(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.3 SR 3.3.2.5	NA	NA
(3) Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.					
b. Phase B Isolation						
(1) Manual Initiation	1,2,3,4	2 trains	I	SR 3.3.2.6	NA	NA
(2) Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	C	SR 3.3.2.2 SR 3.3.2.3 SR 3.3.2.5	NA	NA
(3) Containment Pressure						
High High	1,2,3,4	6 (2 sets of 3)	E	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≤ 20.45 psig	≤ 20 psig

(continued)

Table 3.3.2-1 (page 3 of 4)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
4. Steam Line Isolation						
a. Manual Initiation	1,2(b),3(b)	1 per steam line	F	SR 3.3.2.6	NA	NA
b. Automatic Actuation Logic and Actuation Relays	1,2(b),3(b)	2 trains	G	SR 3.3.2.2 SR 3.3.2.3 SR 3.3.2.5	NA	NA
c. Containment Pressure - High High	1,2(b),3(b)	6 (2 sets of 3)	D	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≤ 20.45 psig	≤ 20 psig
d. High Steam Flow in Two Steam Lines	1,2(b),3(b)	2 per steam line	D	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	(d)	(e)
Coincident with T_{avg} - Low	1,2(b), 3(b)(c)	1 per loop	D	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≥ 541.50 °F	≥ 543°F
e. High Steam Flow in Two Steam Lines	1,2(b),3(b)	2 per steam line	D	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	(d)	(e)
Coincident with Steam Line Pressure - Low	1,2(b),3(b)	1 per steam line	D	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≥ 605.05 psig	≥ 614 psig

(continued)

(b) Except when all MSIVs are closed.
(c) Above the T_{avg}-Low interlock.
(d) Less than or equal to a function defined as ΔP corresponding to 41.58% full steam flow below 20% load, and ΔP increasing linearly from 41.58% full steam flow at 20% load to 110.5% full steam flow at 100% load, and ΔP corresponding to 110.5% full steam flow above 100% load.
(e) Less than or equal to a function defined as ΔP corresponding to 37.25% full steam flow between 0% and 20% load and then a ΔP increasing linearly from 37.25% steam flow at 20% load to 109% full steam flow at 100% load.

Table 3.3.2-1 (page 4 of 4)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
5. Feedwater Isolation						
a. Automatic Actuation Logic and Actuation Relays	1,2(f),3(f)	2 trains	G	SR 3.3.2.2 SR 3.3.2.3 SR 3.3.2.5	NA	NA
b. Safety Injection	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.					
6. ESFAS Interlocks						
a. Pressurizer Pressure Low	1,2,3	3	H	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≤ 2005.11 psig	≤ 2000 psig
b. T_{avg} – Low	1,2,3	1 per loop	H	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≤ 544.50 °F	≤ 543°F

(f) Except when all MFIVs, MFRVs, and bypass valves are closed or isolated by a closed manual valve.

3.3 INSTRUMENTATION

3.3.3 Post Accident Monitoring (PAM) Instrumentation

LCO 3.3.3 The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

-----------------------------------NOTES-----------------------------------

1. LCO 3.0.4 is not applicable.
2. Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ---------NOTE-------- Not applicable to Functions 3, 4, 19, 22, 23, and 24. -------------------- One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.6	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. ---------NOTE--------- Not applicable to hydrogen monitor channels. --------------------- One or more Functions with two required channels inoperable.	C.1 Restore one channel to OPERABLE status.	7 days
D. ---------NOTE--------- Only applicable to Functions 3, 4, 19, 22, 23, and 24. --------------------- One or more Functions with one required channel inoperable.	D.1 Restore required channel to OPERABLE status.	7 days
E. Two hydrogen monitor channels inoperable.	E.1 Restore one hydrogen monitor channel to OPERABLE status.	72 hours
F. Required Action and associated Completion Time of Condition C, D, or E not met.	F.1 Enter the Condition referenced in Table 3.3.3-1 for the channel.	Immediately
G. As required by Required Action F.1 and referenced in Table 3.3.3-1.	G.1 Be in MODE 3. AND G.2 Be in MODE 4.	6 hours 12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. As required by Required Action F.1 and referenced in Table 3.3.3-1.	H.1 Initiate action in accordance with Specification 5.6.6.	Immediately

SURVEILLANCE REQUIREMENTS

------------------------------------NOTE------------------------------------
SR 3.3.3.1 and SR 3.3.3.2 apply to each PAM instrumentation Function in Table 3.3.3-1, except Function 9; SR 3.3.3.3 applies only to Function 9.

SURVEILLANCE		FREQUENCY
SR 3.3.3.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days
SR 3.3.3.2	------------------NOTE------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	18 months
SR 3.3.3.3	------------------NOTE------------------ Verification of setpoint not required. --- Perform TADOT.	18 months

Table 3.3.3-1 (page 1 of 1)
Post Accident Monitoring Instrumentation

	FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION F.1
1.	Power Range Neutron Flux	2	G
2.	Source Range Neutron Flux	2	G
3.	Reactor Coolant System (RCS) Hot Leg Temperature	1 per loop	G
4.	RCS Cold Leg Temperature	1 per loop	G
5.	RCS Pressure (Wide Range)	2	G
6.	Refueling Water Storage Tank Level	2	G
7.	Containment Sump Water Level (Wide Range)	2	H
8.	Containment Pressure (Wide Range)	2	H
9.	Containment Isolation Valve Position	2 per penetration flow path[a][b]	G
10.	Containment Area Radiation (High Range)	2	H
11.	Hydrogen Monitors	2	G
12.	Pressurizer Level	2	G
13.	Steam Generator Water Level (Narrow Range)	2 per SG	G
14.	Condensate Storage Tank Level	2	G
15.	Core Exit Temperature - Quadrant 1	2[c]	G
16.	Core Exit Temperature - Quadrant 2	2[c]	G
17.	Core Exit Temperature - Quadrant 3	2[c]	G
18.	Core Exit Temperature - Quadrant 4	2[c]	G
19.	Auxiliary Feedwater Flow		
	SD AFW Pump	1 per SG	H
	MD AFW Pump	1 per SG	H
20.	Steam Generator Pressure	2 per SG	G
21.	Containment Spray Additive Tank Level	2	G
22.	PORV Position (Primary)	1	H
23.	PORV Block Valve Position (Primary)	1	H
24.	Safety Valve Position (Primary)	1	H

(a) Not required for isolation valves whose associated penetration is isolated by at least one closed and deactivated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.

(b) Only one position indication channel is required for penetration flow paths with only one installed automatic containment isolation valve.

(c) A channel consists of one core exit thermocouple (CET).

3.3 INSTRUMENTATION

3.3.4 Remote Shutdown System

LCO 3.3.4 The Remote Shutdown System Functions shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

-----------------------------------NOTES-----------------------------------
1. LCO 3.0.4 is not applicable.
2. Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required Functions inoperable.	A.1 Restore required Function to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 4.	6 hours 12 hours

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3.3 INSTRUMENTATION

3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

LCO 3.3.5 Two channels per bus of the loss of voltage Function and three channels per bus of the degraded voltage Function shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4,
When associated DG is required to be OPERABLE by LCO 3.8.2, "AC Sources – Shutdown."

------------------------------NOTE------------------------------
Degraded Voltage Function may be blocked while starting RCPs when the unit is not in MODE 1.

ACTIONS

------------------------------NOTE------------------------------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Loss of Voltage Function with one or more channels per bus inoperable.	A.1 Restore channel(s) to OPERABLE status.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Degraded Voltage Function with one channel per bus inoperable.	B.1	--------NOTE-------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. -------------------- Place channel in trip.	 6 hours
C. Degraded Voltage Function with two or more channels per bus inoperable.	C.1	Restore all but one channel to OPERABLE status.	1 hour
D. Required Action and associated Completion Time not met.	D.1	Enter applicable Condition(s) and Required Action(s) for the associated DG made inoperable by LOP DG start instrumentation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.5.1	------------------NOTE------------------ Verification of setpoint not required. --- Perform TADOT.	 18 months

(continued)

3.3 INSTRUMENTATION

3.3.6 Containment Ventilation Isolation Instrumentation

LCO 3.3.6 The Containment Ventilation Isolation instrumentation for each Function in Table 3.3.6-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.6-1.

ACTIONS

-----------------------------------NOTE-----------------------------------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more manual or automatic actuation trains inoperable.	A.1 Place and maintain containment purge supply and exhaust valves in closed position.	Immediately
<u>OR</u>	<u>AND</u>	
One or more radiation monitoring channels inoperable.	A.2 Enter applicable Conditions and Required Actions of LCO 3.9.3, "Containment Penetrations," for containment ventilation isolation valves made inoperable by isolation instrumentation.	Immediately

SURVEILLANCE REQUIREMENTS

------------------------------------NOTE------------------------------------
Refer to Table 3.3.6-1 to determine which SRs apply for each Containment Ventilation Isolation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.6.2	Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.6.3	Perform MASTER RELAY TEST.	18 months
SR 3.3.6.4	Perform COT.	92 days
SR 3.3.6.5	Perform SLAVE RELAY TEST.	18 months
SR 3.3.6.6	-------------------NOTE------------------- Verification of setpoint is not required. --- Perform TADOT.	18 months
SR 3.3.6.7	Perform CHANNEL CALIBRATION.	18 months

Table 3.3.6-1 (page 1 of 1)
Containment Ventilation Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
1. Manual Initiation	1,2,3,4, (a),(b)	2	SR 3.3.6.6	NA
2. Automatic Actuation Logic and Actuation Relays	1,2,3,4, (a),(b)	2 trains	SR 3.3.6.2 SR 3.3.6.3 SR 3.3.6.5	NA
3. Containment Radiation				
a. Gaseous	(a),(b),(c)	1	SR 3.3.6.1 SR 3.3.6.4 SR 3.3.6.7	(d)
b. Particulate	(a),(b),(c)	1	SR 3.3.6.1 SR 3.3.6.4 SR 3.3.6.7	(d)
4. Containment Isolation-Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			

(a) During CORE ALTERATIONS.
(b) During movement of irradiated fuel assemblies within containment.
(c) During Purging.
(d) Trip Setpoint shall be in accordance with the methodology in the Offsite Dose Calculation Manual.

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Two automatic actuation trains inoperable. OR One radiation monitoring channel inoperable.	B.1.1	Place one CREFS train in emergency pressurization mode.	Immediately
	AND		
	B.1.2	Enter applicable Conditions and Required Actions of LCO 3.7.9, "Control Room Emergency Filtration System (CREFS)," for one CREFS train made inoperable by inoperable CREFS actuation instrumentation.	Immediately
	OR		
	B.2	----------NOTE-------- Not applicable if two automatic actuation trains are inoperable. -------------------- Place the radiation monitoring channel in trip.	Immediately
C. Required Action and associated Completion Time for Condition A or B not met in MODE 1, 2, 3, or 4.	C.1	Be in MODE 3.	6 hours
	AND		
	C.2	Be in MODE 5.	36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time for Condition A or B not met during movement of irradiated fuel assemblies or during CORE ALTERATIONS.	D.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	D.2 Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

-----NOTE-----
Refer to Table 3.3.7-1 to determine which SRs apply for each CREFS Actuation Function.

SURVEILLANCE	FREQUENCY
SR 3.3.7.1 Perform CHANNEL CHECK.	12 hours
SR 3.3.7.2 Perform COT.	92 days
SR 3.3.7.3 Perform ACTUATION LOGIC TEST.	31 days on a STAGGERED TEST BASIS
SR 3.3.7.4 Perform MASTER RELAY TEST.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.7.5	Perform SLAVE RELAY TEST.	18 months
SR 3.3.7.6	Perform CHANNEL CALIBRATION.	18 months

Table 3.3.7-1 (page 1 of 1)
CREFS Actuation Instrumentation

	FUNCTION	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
1.	Automatic Actuation Logic and Actuation Relays	2 trains	SR 3.3.7.3 SR 3.3.7.4 SR 3.3.7.5	NA
2.	Control Room Radiation Monitor	1	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.6	≤ 2.5 mR/hr
3.	Safety Injection	Refer to LCO 3.3.2. "ESFAS Instrumentation." Function 1. for all initiation functions and requirements.		

3.3 INSTRUMENTATION

3.3.8 Auxiliary Feedwater (AFW) System Instrumentation

LCO 3.3.8 The AFW instrumentation for each Function in Table 3.3.8-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.8-1.

ACTIONS

-----------------------------------NOTE-----------------------------------
Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.8-1 for the channel(s) or train(s).	Immediately
B. One channel inoperable.	B.1 Place channel in trip.	6 hours
	<u>OR</u>	
	B.2.1 Be in MODE 3.	12 hours
	<u>AND</u>	
	B.2.2 Be in MODE 4.	18 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One channel inoperable.	C.1 Restore channel or train to OPERABLE status.	48 hours
	<u>OR</u>	
	C.2.1 Be in MODE 3.	54 hours
	<u>AND</u>	
	C.2.2 Be in MODE 4.	60 hours
D. One Main Feedwater Pumps trip channel inoperable.	D.1 Restore channel to OPERABLE status.	48 hours
	<u>OR</u>	
	D.2 Be in MODE 3.	54 hours

SURVEILLANCE REQUIREMENTS

-----------------------------------NOTE-----------------------------------
Refer to Table 3.3.8-1 to determine which SRs apply for each AFW Function.

SURVEILLANCE	FREQUENCY
SR 3.3.8.1 Perform CHANNEL CHECK.	12 hours
SR 3.3.8.2 Perform COT.	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.8.3	-------------------NOTE------------------ For Function 5, the TADOT shall include injection of a simulated or actual signal to verify channel OPERABILITY. --- Perform TADOT.	18 months
SR 3.3.8.4	Perform CHANNEL CALIBRATION.	18 months

Table 3.3.8-1 (page 1 of 1)
Auxiliary Feedwater System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
1.	SG Water Level-Low Low	1,2,3	3 per SG	B	SR 3.3.8.1 SR 3.3.8.2 SR 3.3.8.4	≥ 15.36%	≥ 16%
2.	Safety Injection	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 1, for all initiation functions and requirements.					
3.	Loss of Offsite Power	1,2,3	2 per bus	C	SR 3.3.8.3 SR 3.3.8.4	328 V ± 10% with ≤ 1 sec time delay	328 V with ≤ 1 sec time delay
4.	Undervoltage Reactor Coolant Pump	1,2,3	2 per bus	B	SR 3.3.8.3 SR 3.3.8.4	≥ 2959 V	≥ 3120 V
5.	Trip of all Main Feedwater Pumps	1,2	1 per pump	D	SR 3.3.8.3	NA	NA

B 3.3 INSTRUMENTATION

B 3.3.1 Reactor Protection System (RPS) Instrumentation

BASES

BACKGROUND

The RPS initiates a unit shutdown, based on the values of selected unit parameters, to protect against violating the core fuel design limits and Reactor Coolant System (RCS) pressure boundary during anticipated operational occurrences (AOOs) and to assist the Engineered Safety Features (ESF) Systems in mitigating accidents.

The protection and monitoring systems have been designed to assure safe operation of the reactor. This is achieved by specifying limiting safety system settings (LSSS) in terms of parameters directly monitored by the RPS, as well as specifying LCOs on other reactor system parameters and equipment performance.

The LSSS, defined in this specification as the Trip Setpoints, in conjunction with the LCOs, establish the threshold for protective system action to prevent exceeding acceptable limits during Design Basis Accidents (DBAs).

During AOOs, which are those events expected to occur one or more times during the unit life, the acceptable limits are:

1. The Departure from Nucleate Boiling Ratio (DNBR) shall be maintained above the Safety Limit (SL) value to prevent departure from nucleate boiling (DNB);

2. Fuel centerline melt shall not occur; and

3. The RCS pressure SL of 2735 psig shall not be exceeded.

Operation within the SLs of Specification 2.0, "Safety Limits (SLs)," also maintains the above values and assures that offsite dose will be within the 10 CFR 50 and 10 CFR 100 criteria during AOOs.

Accidents are events that are analyzed even though they are not expected to occur during the unit life. The acceptable limit during accidents is that offsite dose shall be maintained within an acceptable fraction of 10 CFR 100 limits. Different accident categories are allowed a

(continued)

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BACKGROUND (continued)

different fraction of these limits, based on probability of occurrence. Meeting the acceptable dose limit for an accident category is considered having acceptable consequences for that event.

The RPS instrumentation is segmented into four distinct but interconnected modules as illustrated in the UFSAR, Chapter 7 (Ref. 1), and as identified below:

1. Field transmitters or process sensors: provide a measurable electronic signal based upon the physical characteristics of the parameter being measured;

2. Signal Process Control and Protection System, including Analog Protection System, Nuclear Instrumentation System (NIS), field contacts, and protection channel sets: provides signal conditioning, bistable setpoint comparison, process algorithm actuation, compatible electrical signal output to protection system devices, and control board/control room/miscellaneous indications;

3. RPS relay logic: initiates proper unit shutdown and/or ESF actuation in accordance with the defined logic, which is based on the bistable outputs from the signal process control and protection system; and

4. Reactor trip switchgear, including reactor trip breakers (RTBs) and bypass breakers: provides the means to interrupt power to the control rod drive mechanisms (CRDMs) and allows the rod cluster control assemblies (RCCAs), or "rods," to fall into the core and shut down the reactor. The bypass breakers allow testing of the RTBs at power.

Field Transmitters or Sensors

To meet the design demands for redundancy and reliability, more than one, and often as many as four, field transmitters or sensors are used to measure unit parameters. To account for the calibration tolerances and instrument drift, which are assumed to occur between calibrations, statistical allowances are provided in the Trip Setpoint and Allowable

(continued)

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BACKGROUND

Field Transmitters or Sensors (continued)

Values. The OPERABILITY of each transmitter or sensor can be evaluated when its "as found" calibration data are compared against its documented acceptance criteria.

Signal Process Control and Protection System

Generally, three or four channels of process control equipment are used for the signal processing of unit parameters measured by the field instruments. The process control equipment provides signal conditioning, comparable output signals for instruments located on the main control board, and comparison of measured input signals with setpoints established by safety analyses. These setpoints are defined in UFSAR, Chapter 7 (Ref. 1), Chapter 6 (Ref. 2), and Chapter 15 (Ref. 3). If the measured value of a unit parameter exceeds the predetermined setpoint, an output from a bistable is forwarded to the RPS relay logic. Channel separation is maintained up to and through the input bays. However, not all unit parameters require four channels of sensor measurement and signal processing. Some unit parameters provide input only to the RPS relay logic, while others provide input to the RPS relay logic, the main control board, the unit computer, and one or more control systems.

The instrumentation system is designed in accordance with HBRSEP design criteria, which is described in UFSAR Section 3.1 (Ref. 4), and IEEE-279-1968 (Ref. 5).

Where a plant condition that requires protective action can be brought on by a failure or malfunction of the control system, and the same failure or malfunction prevents proper action of a protection system channel or channels designed to protect against the resultant unsafe condition, the remaining portions of the protection system will automatically initiate appropriate protective action whenever a plant condition monitored by the system reaches its trip setpoint. No single failure within the protection system will prevent proper protection system action when required. These requirements are described in Reference 5.

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Signal Process Control and Protection System (continued)

The instrumentation system is designed in accordance with HBRSEP design criteria, which is described in UFSAR Section 3.1 (Ref. 4), and IEEE-279-1968 (Ref. 5).

Where a plant condition that requires protective action can be brought on by a failure or malfunction of the control system, and the same failure or malfunction prevents proper action of a protection system channel or channels designed to protect against the resultant unsafe condition, the remaining portions of the protection system will automatically initiate appropriate protective action whenever a plant condition monitored by the system reaches its trip setpoint. No single failure within the protection system will prevent proper protection system action when required. These requirements are described in Reference 5.

Two logic channels are required to ensure no single random failure of a logic channel will disable the RPS. The logic channels are designed such that testing required while the reactor is at power may be accomplished without causing trip.

Trip Setpoints and Allowable Values

The Trip Setpoints are the nominal values at which the bistables are set. Any bistable is considered to be properly adjusted when the "as left" value is within the band for CHANNEL CALIBRATION accuracy (i.e., ± rack calibration + comparator setting accuracy).

The Trip Setpoints used in the bistables are based on the analytical limits stated in Reference 3. The selection of these Trip Setpoints is such that adequate protection is provided when all sensor and processing time delays accounted for in setpoint calculations and accident analyses are taken into account. To allow for calibration tolerances, instrumentation uncertainties, instrument drift, and severe environment errors for those RPS channels that must function in harsh environments as defined by 10 CFR 50.49 (Ref. 6), the Trip Setpoints and Allowable Values specified in Table 3.3.1-1 in the accompanying LCO are conservatively adjusted with respect to the analytical limits. A detailed description of the methodology used to

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BACKGROUND

Trip Setpoints and Allowable Values (continued)

calculate the Trip Setpoints, including their explicit uncertainties, is provided in the company setpoint methodology procedure. The actual nominal Trip Setpoint entered into the bistable is more conservative than that specified by the Allowable Value to account for changes in random measurement errors detectable by a COT. One example of such a change in measurement error is drift during the surveillance interval. If the measured setpoint does not exceed the Allowable Value, the channel is considered OPERABLE.

Setpoints in accordance with the Allowable Value ensure that SLs are not violated during AOOs (and that the consequences of DBAs will be acceptable, providing the unit is operated from within the LCOs at the onset of the AOO or DBA and the equipment functions as designed). Note that in the accompanying LCO 3.3.1, the Trip Setpoints are the LSSS.

Each channel of the analog protection system can be tested on line to verify that the signal or setpoint accuracy is within the specified allowance requirements of calculations performed in accordance with the company setpoint methodology procedure. Once a designated channel is taken out of service for testing, a simulated signal is injected into the channel for testing. The process equipment for the channel in test is then tested, verified, and calibrated. SRs for the channels are specified in the SRs section.

The Trip Setpoints and Allowable Values listed in Table 3.3.1-1 are based on the methodology described in the company setpoint methodology procedure, which incorporates all of the applicable uncertainties for each channel. The magnitudes of these uncertainties are factored into the determination of each Trip Setpoint. All field sensors and signal processing equipment for these channels are assumed to operate within the allowances of these uncertainty magnitudes.

Reactor Protection System Relay Logic

This equipment is used for the decision logic processing of outputs from the signal processing equipment bistables. To meet the redundancy requirements, two trains of RPS logic,

(continued)

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BACKGROUND

Reactor Protection System Relay Logic (continued)

each performing the same functions, are provided. If one train is taken out of service for maintenance or test purposes, the second train will provide reactor trip for the unit. If both trains are taken out of service or placed in test, a reactor trip will result. Each train is packaged in its own cabinets for physical and electrical separation to satisfy separation and independence requirements. The system has been designed to trip in the event of a loss of power, directing the unit to a safe shutdown condition.

The relay logic performs the decision logic for actuating a reactor trip, generates the electrical output signal that will initiate the required trip, and provides the status, permissive, and annunciator output signals to the main control room of the unit.

The bistable outputs from the signal processing equipment are sensed by the relay logic equipment and combined into logic matrices that represent combinations indicative of various unit upset and accident transients. If a required logic matrix combination is completed, the system will initiate a reactor trip. Examples are given in the Applicable Safety Analyses, LCO, and Applicability sections of this Bases.

Reactor Trip Switchgear

The RTBs are in the electrical power supply line from the control rod drive motor generator set power supply to the CRDMs. Opening of the RTBs interrupts power to the CRDMs, which allows the shutdown rods and control rods to fall into the core by gravity. Each RTB is equipped with a bypass breaker to allow testing of the RTB while the unit is at power. During normal operation the output from the RPS relay logic is a voltage signal that energizes the undervoltage coils in the RTBs and bypass breakers, if in use. When the required logic matrix combination is completed, the RPS relay logic output voltage signal is removed, the undervoltage coils are de-energized, the breaker trip lever is actuated by the de-energized undervoltage coil, and the RTBs and bypass breakers are tripped open. This allows the shutdown rods and control rods to fall into the core. In addition to the

(continued)

BASES

BACKGROUND

Reactor Trip Switchgear (continued)

de-energization of the undervoltage coils, each RTB is also equipped with a shunt trip device that is energized to trip the breaker open upon receipt of a reactor trip signal from the RPS relay logic. Either the undervoltage coil or the shunt trip mechanism is sufficient by itself, thus providing a diverse trip mechanism.

The RPS relay logic matrix Functions are described in the functional diagrams included in Reference 1. In addition to the reactor trip or ESF, these diagrams also describe the various "permissive interlocks" that are associated with unit conditions. When an RPS train is removed from service for testing, the other train is relied upon to provide the automatic reactor protection requirements.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The RPS functions to maintain the SLs during all AOOs and mitigates the consequences of DBAs in all MODES in which the RTBs are closed.

Each of the analyzed accidents and transients can be detected by one or more RPS Functions. The accident analysis described in Reference 3 takes credit for most RPS trip Functions. RPS trip Functions not specifically credited in the accident analysis are qualitatively credited in the safety analysis and the NRC staff approved licensing basis for the unit. These RPS trip Functions may provide protection for conditions that do not require dynamic transient analysis to demonstrate Function performance. They may also serve as backups to RPS trip Functions that were credited in the accident analysis.

The LCO requires all instrumentation performing an RPS Function, listed in Table 3.3.1-1 in the accompanying LCO, to be OPERABLE. Failure of any instrument renders the affected channel(s) inoperable and reduces the reliability of the affected Functions.

The LCO generally requires OPERABILITY of four or three channels in each instrumentation Function, two channels of Manual Reactor Trip in each logic Function, and two trains in each Automatic Trip Logic Function. The two-out-of-three and two-out-of-four configurations allow one channel to be

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

tripped during maintenance or testing without causing a reactor trip. Specific exceptions to the above general philosophy exist and are discussed below.

Reactor Protection System Functions

The safety analyses and OPERABILITY requirements applicable to each RPS Function are discussed below:

1. Manual Reactor Trip

The Manual Reactor Trip ensures that the control room operator can initiate a reactor trip at any time by using either of two reactor trip push buttons in the control room. A Manual Reactor Trip accomplishes the same results as any one of the automatic trip Functions. It is used by the reactor operator to shut down the reactor whenever any RPS or Engineered Safety Features Actuation System (ESFAS) parameter is rapidly trending toward its Trip Setpoint.

The LCO requires two Manual Reactor Trip channels to be OPERABLE. Each channel is controlled by a manual reactor trip push button. Each channel activates the reactor trip breaker in both trains. Two independent channels are required to be OPERABLE so that no single random failure will disable the Manual Reactor Trip Function.

In MODE 1 or 2, manual initiation of a reactor trip must be OPERABLE. These are the MODES in which the shutdown rods and/or control rods are partially or fully withdrawn from the core. In MODE 3, 4, or 5, the manual initiation Function must also be OPERABLE if the shutdown rods or control rods are withdrawn or the Control Rod Drive (CRD) System is capable of withdrawing the shutdown rods or the control rods. In this condition, inadvertent control rod withdrawal is possible. In MODE 3, 4, or 5, manual initiation of a reactor trip does not have to be OPERABLE if the RTBs are open. If the RTBs are open, there is no need to be able to trip the reactor because all of the rods are inserted. This requirement maintains maximum shutdown margin available in the event of a reactivity excursion while in MODES 3, 4, or 5. In MODE 6,

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1. Manual Reactor Trip (continued)

neither the shutdown rods nor the control rods are permitted to be withdrawn and the CRDMs are disconnected from the control rods and shutdown rods. Therefore, the manual initiation Function is not required.

2. Power Range Neutron Flux

The NIS power range detectors are located external to the reactor vessel and measure neutrons leaking from the core. The NIS power range detectors provide input to the Rod Control System and the Turbine Control System. Therefore, the actuation logic must be able to withstand an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation. Note that this Function also provides a signal to prevent automatic and manual rod withdrawal prior to initiating a reactor trip. Limiting further rod withdrawal may terminate the transient and eliminate the need to trip the reactor.

a. Power Range Neutron Flux-High

The Power Range Neutron Flux-High trip Function ensures that protection is provided, from all power levels, against a positive reactivity excursion leading to DNB during power operations. These can be caused by rod withdrawal or reductions in RCS temperature.

The LCO requires all four of the Power Range Neutron Flux-High channels to be OPERABLE.

In MODE 1 or 2, when a positive reactivity excursion could occur, the Power Range Neutron Flux-High trip must be OPERABLE. This Function will terminate the reactivity excursion and shut down the reactor prior to reaching a power level that could damage the fuel. In MODE 3, 4, 5, or 6, the NIS power range detectors cannot detect neutron levels in this range. In these MODES, the Power Range Neutron Flux-High does not have

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

a. Power Range Neutron Flux-High (continued)

to be OPERABLE because the reactor is shut down and reactivity excursions into the power range are extremely unlikely. Other RPS Functions and administrative controls provide protection against reactivity additions when in MODE 3, 4, 5, or 6.

b. Power Range Neutron Flux-Low

The LCO requirement for the Power Range Neutron Flux-Low trip Function ensures that protection is provided against a positive reactivity excursion from low power or subcritical conditions.

The LCO requires all four of the Power Range Neutron Flux-Low channels to be OPERABLE.

In MODE 1, below the Power Range Neutron Flux (P-10 setpoint), and in MODE 2, the Power Range Neutron Flux-Low trip must be OPERABLE. This Function may be manually blocked by the operator when two out of four power range channels are greater than approximately 10% RTP (P-10 setpoint). This Function is automatically unblocked when three out of four power range channels are below the P-10 setpoint. Above the P-10 setpoint, positive reactivity additions are mitigated by the Power Range Neutron Flux-High trip Function.

In MODE 3, 4, 5, or 6, the Power Range Neutron Flux-Low trip Function does not have to be OPERABLE because the reactor is shut down and the NIS power range detectors cannot detect neutron levels in this range. Other RPS trip Functions and administrative controls provide protection against positive reactivity additions or power excursions in MODE 3, 4, 5, or 6.

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

3. Intermediate Range Neutron Flux

The Intermediate Range Neutron Flux trip Function ensures that protection is provided against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. This trip Function provides redundant protection to the Power Range Neutron Flux – Low Setpoint trip Function. The NIS intermediate range detectors are located external to the reactor vessel and measure neutrons leaking from the core. The NIS intermediate range detectors do not provide any input to control systems. Note that this Function also provides a signal to prevent automatic and manual rod withdrawal prior to initiating a reactor trip. Limiting further rod withdrawal may terminate the transient and eliminate the need to trip the reactor.

The LCO requires two channels of Intermediate Range Neutron Flux to be OPERABLE. Two OPERABLE channels are sufficient to ensure no single random failure will disable this trip Function.

Because this trip Function is important only during startup, there is generally no need to disable channels for testing while the Function is required to be OPERABLE. Therefore, a third channel is unnecessary.

In MODE 1 below the P-10 setpoint, and in MODE 2, when there is a potential for an uncontrolled RCCA bank rod withdrawal accident during reactor startup, the Intermediate Range Neutron Flux trip must be OPERABLE. Above the P-10 setpoint, the Power Range Neutron Flux – High Setpoint trip provides core protection for a rod withdrawal accident. In MODE 3, 4, or 5, the Intermediate Range Neutron Flux trip does not have to be OPERABLE because the control rods must be ≤ 5 steps withdrawn and only the shutdown rods may be fully withdrawn. The reactor cannot be started up in this condition. The core also has the required SDM to mitigate the consequences of a positive reactivity addition accident. In MODE 6, all rods are fully inserted and the core has a required increased SDM. Also, the NIS intermediate range detectors cannot detect neutron levels present in this MODE.

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

4. Source Range Neutron Flux

The LCO requirement for the Source Range Neutron Flux trip Function ensures that protection is provided against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. This trip Function provides redundant protection to the Power Range Neutron Flux - Low Setpoint and Intermediate Range Neutron Flux trip Functions. In MODES 3, 4, and 5, administrative controls also prevent the uncontrolled withdrawal of rods. The NIS source range detectors are located external to the reactor vessel and measure neutrons leaking from the core. The NIS source range detectors do not provide any inputs to control systems. The source range trip is the only RPS automatic protection function required in MODES 3, 4, and 5. Therefore, the functional capability at the specified Trip Setpoint is assumed to be available.

The LCO requires two channels of Source Range Neutron Flux to be OPERABLE. Two OPERABLE channels are sufficient to ensure no single random failure will disable this trip Function. The LCO also requires one channel of the Source Range Neutron Flux to be OPERABLE in MODE 3, 4, or 5 with RTBs open. In this case, the source range Function is to provide control room indication. The outputs of the Function to RPS logic are not required OPERABLE when the RTBs are open.

The Source Range Neutron Flux Function provides protection for control rod withdrawal from subcritical, boron dilution and control rod ejection events. The Function also provides visual neutron flux indication and alarm in the control room.

In MODE 2 when below the P-6 setpoint during a reactor startup, the Source Range Neutron Flux trip must be OPERABLE. Above the P-6 setpoint, the Intermediate Range Neutron Flux trip and the Power Range Neutron Flux - Low Setpoint trip will provide core protection for reactivity accidents. Above the P-6 setpoint, the NIS source range detectors are de-energized and inoperable.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

4. Source Range Neutron Flux (continued)

In MODE 3, 4, or 5 with the RTBs closed, the Source Range Neutron Flux trip Function must also be OPERABLE. If the reactor trip breakers are closed, the Source Range Neutron Flux trip must be OPERABLE to provide core protection against a rod withdrawal, boron dilution, or steam line break accident. If the RTBs are open, the source range detectors are not required to trip the reactor. However, their monitoring Function must be OPERABLE to monitor core neutron levels and provide indication of reactivity changes that may occur as a result of events like a boron dilution. The requirements for the NIS source range detectors in MODE 6 are addressed in LCO 3.9.2, "Nuclear Instrumentation."

5. Overtemperature ΔT

The Overtemperature ΔT trip Function is provided to ensure that the design limit DNBR is met. This trip Function also limits the range over which the Overpower ΔT trip Function must provide protection. The inputs to the Overtemperature ΔT trip include pressurizer pressure, coolant temperature, axial power distribution, and reactor power as indicated by loop ΔT assuming full reactor coolant flow. Protection from violating the DNBR limit is assured for those transients that are slow with respect to delays from the core to the measurement system. The Function monitors both variation in power and flow since a decrease in flow has the same effect on ΔT as a power increase. The Overtemperature ΔT trip Function uses each loop's ΔT as a measure of reactor power and is compared with a setpoint that is automatically varied with the following parameters:

- reactor coolant average temperature – the Trip Setpoint is varied to correct for changes in coolant density and specific heat capacity with changes in coolant temperature;
- pressurizer pressure – the Trip Setpoint is varied to correct for changes in system pressure; and

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

5. Overtemperature ΔT (continued)

- axial power distribution – f(ΔI), the Trip Setpoint is varied to account for imbalances in the axial power distribution as detected by the NIS upper and lower power range detectors. If axial peaks are greater than the design limit, as indicated by the difference between the upper and lower NIS power range detectors, the Trip Setpoint is reduced in accordance with Note 1 of Table 3.3.1-1.

Dynamic compensation is included for system piping delays from the core to the temperature measurement system and RTD response time.

The Overtemperature ΔT trip Function is calculated for each loop as described in Note 1 of Table 3.3.1-1. Trip occurs if Overtemperature ΔT is indicated in two loops. The function $(1+\tau_1 s)/(1+\tau_2 s)$; is generated by the lead-lag controller for T_{avg} dynamic compensation and f(ΔI) is a function of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers; with gains to be selected based on measured instrument response during plant startup tests. For every % that $(q_b - q_t)$ exceeds 17%, the Overtemperature ΔT setpoint is reduced by 2.4% and for every % that $(q_t - q_b)$ exceeds 12%, the Overtemperature ΔT setpoint is reduced by 2.4%. Note that this Function also provides a signal to generate a turbine runback prior to reaching the Trip Setpoint. A turbine runback will reduce turbine power and reactor power. A reduction in power will normally alleviate the Overtemperature ΔT condition and may prevent a reactor trip.

The LCO requires all three channels of the Overtemperature ΔT trip Function to be OPERABLE. Note that the Overtemperature ΔT Function receives input from channels shared with other RPS Functions. Failures that affect multiple Functions require entry into the Conditions applicable to all affected Functions.

In MODE 1 or 2, the Overtemperature ΔT trip must be OPERABLE to prevent DNB. In MODE 3, 4, 5, or 6, this

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

5. Overtemperature ΔT (continued)

trip Function does not have to be OPERABLE because the reactor is not operating and there is insufficient heat production to be concerned about DNB.

6. Overpower ΔT

The Overpower ΔT trip Function ensures that protection is provided to ensure the integrity of the fuel (i.e., no fuel pellet melting and less than 1% cladding strain) under all possible overpower conditions. This trip Function also limits the required range of the Overtemperature ΔT trip Function and provides a backup to the Power Range Neutron Flux - High Setpoint trip. The Overpower ΔT trip Function ensures that the allowable heat generation rate (kW/ft) of the fuel is not exceeded. It uses the ΔT of each loop as a measure of reactor power with a setpoint that is automatically varied with the following parameters:

- reactor coolant average temperature - the Trip Setpoint is varied to correct for changes in coolant density and specific heat capacity with changes in coolant temperature; and
- rate of change of reactor coolant average temperature - including dynamic compensation for the delays between the core and the temperature measurement system.
- axial power distribution - f(ΔI), the Trip Setpoint is varied to account for imbalances in the axial power distribution as detected by the NIS upper and lower power range detectors. If axial peaks are greater than the design limit, as indicated by the difference between the upper and lower NIS power range detectors, the Trip Setpoint is reduced in accordance with Note 2 of of Table 3.3.1-1.

The Overpower ΔT trip Function is calculated for each loop as per Note 2 of Table 3.3.1-1. Trip occurs if Overpower ΔT is indicated in two loops. The function $(\tau_3 s)/(1+\tau_3 s)$; is generated by the rate-lag controller for T_{avg} dynamic compensation and τ_3 is the time

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

6. Overpower ΔT (continued)

constant utilized in the rate-lag controller for T_{avg}. Note that this Function also provides a signal to generate a turbine runback prior to reaching the Allowable Value. A turbine runback will reduce turbine power and reactor power. A reduction in power will normally alleviate the Overpower ΔT condition and may prevent a reactor trip.

The LCO requires three channels of the Overpower ΔT trip Function to be OPERABLE. Note that the Overpower ΔT trip Function receives input from channels shared with other RPS Functions. Failures that affect multiple Functions require entry into the Conditions applicable to all affected Functions.

In MODE 1 or 2, the Overpower ΔT trip Function must be OPERABLE. These are the only times that enough heat is generated in the fuel to be concerned about the heat generation rates and overheating of the fuel. In MODE 3, 4, 5, or 6, this trip Function does not have to be OPERABLE because the reactor is not operating and there is insufficient heat production to be concerned about fuel overheating and fuel damage.

7. Pressurizer Pressure

The same sensors provide input to the Pressurizer Pressure – High and – Low trips and the Overtemperature ΔT trip.

a. Pressurizer Pressure–Low

The Pressurizer Pressure – Low trip Function ensures that protection is provided against violating the DNBR limit due to low pressure.

The LCO requires three channels of Pressurizer Pressure – Low to be OPERABLE.

In MODE 1, when DNB is a major concern, the Pressurizer Pressure – Low trip must be OPERABLE. This trip Function is automatically enabled on increasing power by the P-7 interlock (NIS power range P-10 or turbine impulse pressure greater

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

a. Pressurizer Pressure—Low (continued)

than approximately 10% of full power equivalent (P-7 input)). On decreasing power, this trip Function is automatically blocked below P-7. Below the P-7 setpoint, no conceivable power distributions can occur that would cause DNB concerns.

b. Pressurizer Pressure—High

The Pressurizer Pressure-High trip Function ensures that protection is provided against overpressurizing the RCS. This trip Function operates in conjunction with the pressurizer relief and safety valves to prevent RCS overpressure conditions.

The LCO requires three channels of the Pressurizer Pressure-High to be OPERABLE.

The Pressurizer Pressure-High LSSS is selected to be below the pressurizer safety valve actuation pressure and above the power operated relief valve (PORV) setting. This setting minimizes challenges to safety valves while avoiding unnecessary reactor trip for those pressure increases that can be controlled by the PORVs.

In MODE 1 or 2, the Pressurizer Pressure-High trip must be OPERABLE to help prevent RCS overpressurization and minimize challenges to the safety valves. In MODE 3, 4, 5, or 6, the Pressurizer Pressure-High trip Function does not have to be OPERABLE because transients that could cause an overpressure condition will be slow to occur. Therefore, the operator will have sufficient time to evaluate unit conditions and take corrective actions. Additionally, low temperature overpressure protection systems provide overpressure protection when below MODE 4.

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

8. Pressurizer Water Level—High

The Pressurizer Water Level - High trip Function provides a backup signal for the Pressurizer Pressure - High trip and also provides protection against water relief through the pressurizer safety valves. These valves are designed to pass steam in order to achieve their design energy removal rate. A reactor trip is actuated prior to the pressurizer becoming water solid. The LCO requires three channels of Pressurizer Water Level - High to be OPERABLE. The pressurizer level channels are used as input to the Pressurizer Level Control System. The level channels do not actuate the safety valves, and the high pressure reactor trip is set below the safety valve setting. Therefore, with the slow rate of charging available, pressure overshoot due to level channel failure cannot cause the safety valve to lift before reactor high pressure trip.

In MODE 1, when there is a potential for overfilling the pressurizer, the Pressurizer Water Level—High trip must be OPERABLE. This trip Function is automatically enabled on increasing power by the P-7 interlock. On decreasing power, this trip Function is automatically blocked below P-7. Below the P-7 setpoint, transients that could raise the pressurizer water level will be slow and the operator will have sufficient time to evaluate unit conditions and take corrective actions.

9. Reactor Coolant Flow—Low

a. Reactor Coolant Flow—Low (Single Loop)

The Reactor Coolant Flow - Low (Single Loop) trip Function ensures that protection is provided against violating the DNBR limit due to low flow in one or more RCS loops, while avoiding reactor trips due to normal variations in loop flow. Above the P-8 setpoint, which is approximately 40% RTP, a loss of flow in any RCS loop will actuate a reactor trip. Each RCS loop has three flow detectors to monitor flow. The flow signals are not used for any control system input.The LCO requires three Reactor Coolant Flow - Low

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

a. Reactor Coolant Flow—Low (Single Loop) (continued)

channels per loop to be OPERABLE in MODE 1 above P-8.

In MODE 1 above the P-8 setpoint, a loss of flow in one RCS loop could result in DNB conditions in the core. In MODE 1 below the P-8 setpoint, a loss of flow in two or more loops is required to actuate a reactor trip (Function 9.b) because of the lower power level and the greater margin to the design limit DNBR.

b. Reactor Coolant Flow—Low (Two Loops)

The Reactor Coolant Flow - Low (Two Loops) trip Function ensures that protection is provided against violating the DNBR limit due to low flow in two or more RCS loops while avoiding reactor trips due to normal variations in loop flow.

Above the P-7 setpoint and below the P-8 setpoint, a loss of flow in two or more loops will initiate a reactor trip. Each loop has three flow detectors to monitor flow. The flow signals are not used for any control system input.

The LCO requires three Reactor Coolant Flow - Low channels per loop to be OPERABLE.

In MODE 1 above the P-7 setpoint and below the P-8 setpoint, the Reactor Coolant Flow - Low (Two Loops) trip must be OPERABLE. Below the P-7 setpoint, all reactor trips on low flow are automatically blocked since no conceivable power distributions could occur that would cause a DNB concern at this low power level. Above the P-7 setpoint, the reactor trip on low flow in two or more RCS loops is automatically enabled. Above the P-8 setpoint, a loss of flow in any one loop will actuate a reactor trip because of the higher power level and the reduced margin to the design limit DNBR.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

10. Reactor Coolant Pump (RCP) Breaker Position

Both RCP Breaker Position trip Functions operate together on two sets of auxiliary contacts, with one set on each RCP breaker. These Functions anticipate the Reactor Coolant Flow-Low trips to avoid RCS heatup that would occur before the low flow trip actuates.

a. Reactor Coolant Pump Breaker Position (Single Loop)

The RCP Breaker Position (Single Loop) trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in one RCS loop. The position of each RCP breaker is monitored. If one RCP breaker is open above the P-8 setpoint, a reactor trip is initiated. This trip Function will generate a reactor trip before the Reactor Coolant Flow-Low (Single Loop) Trip Setpoint is reached.

The LCO requires one RCP Breaker Position channel per RCP to be OPERABLE. One OPERABLE channel is sufficient for this trip Function because the RCS Flow-Low trip alone provides sufficient protection of unit SLs for loss of flow events. The RCP Breaker Position trip serves only to anticipate the low flow trip, minimizing the thermal transient associated with loss of a pump.

This Function measures only the discrete position (open or closed) of the RCP breaker, using a position switch. Therefore, the Function has no adjustable trip setpoint with which to associate an LSSS.

In MODE 1 above the P-8 setpoint, when a loss of flow in any RCS loop could result in DNB conditions in the core, the RCP Breaker Position (Single Loop) trip must be OPERABLE. In MODE 1 below the P-8 setpoint, a loss of flow in two or more loops is required to actuate a reactor trip because of the lower power level and the greater margin to the design limit DNBR.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABLILITY (continued)

b. Reactor Coolant Pump Breaker Position (Two Loops)

The RCP Breaker Position (Two Loops) trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in two or more RCS loops. The position of each RCP breaker is monitored. Above the P-7 setpoint and below the P-8 setpoint, two or more RCP Breakers open will initiate a reactor trip. This trip Function will generate a reactor trip before the Reactor Coolant Flow–Low (Two Loops) Trip Setpoint is reached.

The LCO requires one RCP Breaker Position channel per RCP to be OPERABLE. One OPERABLE channel is sufficient for this Function because the RCS Flow–Low trip alone provides sufficient protection of unit SLs for loss of flow events. The RCP Breaker Position trip serves only to anticipate the low flow trip, minimizing the thermal transient associated with loss of an RCP.

This Function measures only the discrete position (open or closed) of the RCP breaker, using a position switch. Therefore, the Function has no adjustable trip setpoint with which to associate an LSSS.

In MODE 1 above the P-7 setpoint and below the P-8 setpoint, the RCP Breaker Position (Two Loops) trip must be OPERABLE. Below the P-7 setpoint, all reactor trips on loss of flow are automatically blocked since no conceivable power distributions could occur that would cause a DNB concern at this low power level. Above the P-7 setpoint, the reactor trip on loss of flow in two RCS loops is automatically enabled. Above the P-8 setpoint, a loss of flow in any one loop will actuate a reactor trip because of the higher power level and the reduced margin to the design limit DNBR.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

11. Undervoltage Reactor Coolant Pumps

The Undervoltage RCPs reactor trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in two or more RCS loops. The voltage to each RCP is monitored. Above the P-7 setpoint, a loss of voltage detected on two or more RCP buses will initiate a reactor trip. This trip Function will generate a reactor trip before the Reactor Coolant Flow-Low (Two Loops) Trip Setpoint is reached. Time delays are incorporated into the Undervoltage RCPs channels to prevent reactor trips due to momentary electrical power transients.

The LCO requires one Undervoltage RCP channel per bus to be OPERABLE.

In MODE 1 above the P-7 setpoint, the Undervoltage RCP trip must be OPERABLE. Below the P-7 setpoint, all reactor trips on loss of flow are automatically blocked since no conceivable power distributions could occur that would cause a DNB concern at this low power level. Above the P-7 setpoint, the reactor trip on loss of flow in two or more RCS loops is automatically enabled. This Function shares relays with the Auxiliary Feedwater "Undervoltage Reactor Coolant Pump" Function, which starts the steam driven auxiliary feedwater (SDAFW) pump.

12. Underfrequency Reactor Coolant Pumps

The Underfrequency RCPs reactor trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in two or more RCS loops from a major network frequency disturbance. An underfrequency condition will slow down the pumps, thereby reducing their coastdown time following a pump trip. The proper coastdown time is required so that reactor heat can be removed immediately after reactor trip. The frequency of each RCP bus is monitored. Above the P-7 setpoint, a loss of frequency detected on two or more RCP buses will initiate a trip of all RCPs. This trip Function will generate a reactor trip through the RCP breaker position trip logic before the Reactor Coolant Flow-Low (Two Loops) Trip Setpoint is reached. Time delays are incorporated into the

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

12. Underfrequency Reactor Coolant Pumps (continued)

Underfrequency RCPs channels to prevent reactor trips due to momentary electrical power transients.

The LCO requires one Underfrequency RCP channel per bus to be OPERABLE.

In MODE 1 above the P-7 setpoint, the Underfrequency RCPs trip must be OPERABLE. Below the P-7 setpoint, all reactor trips on loss of flow are automatically blocked since no conceivable power distributions could occur that would cause a DNB concern at this low power level. Above the P-7 setpoint, the reactor trip on loss of flow in two or more RCS loops is automatically enabled.

13. Steam Generator Water Level—Low Low

The Steam Generator (SG) Water Level – Low Low trip Function ensures that protection is provided against a loss of heat sink and actuates the Auxiliary Feedwater (AFW) System prior to uncovering the SG tubes. The SGs are the heat sink for the reactor. In order to act as a heat sink, the SGs must contain a minimum amount of water. A narrow range low low level in any SG is indicative of a loss of heat sink for the reactor. The level transmitters provide input to the SG Level Control System. This Function also performs the ESFAS function of starting the AFW pumps on low low SG level.

The LCO requires three channels of SG Water Level – Low Low per SG to be OPERABLE.

In MODE 1 or 2, when the reactor requires a heat sink, the SG Water Level – Low Low trip must be OPERABLE. The normal source of water for the SGs is the Main Feedwater (MFW) System (not safety related). The MFW System is in operation in MODE 1 or 2. The AFW System is the safety related backup source of water to ensure that the SGs remain the heat sink for the reactor. During normal startups and shutdowns, the MFW System provides feedwater to maintain SG level. In MODE 3, 4, 5, or 6, the SG Water Level – Low Low Function does not have to be OPERABLE because the reactor is not

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

13. Steam Generator Water Level-Low Low (continued)

operating or even critical. Decay heat removal is accomplished by the AFW and MFW Systems in MODE 3 and by the Residual Heat Removal (RHR) System in MODE 4, 5, or 6.

14. Steam Generator Water Level-Low, Coincident With Steam Flow/Feedwater Flow Mismatch

SG Water Level - Low, in conjunction with the Steam Flow/Feedwater Flow Mismatch, ensures that protection is provided against a loss of heat sink prior to uncovering the SG tubes. This trip Function provides diverse protection for loss of heat sink upon failure of the controlling SG Level channel in the non-conservative (high) direction, since the controlling level channel is shared with the RPS. Additional discussion of control-protection interaction requirements is provided in Reference 5. In addition to a decreasing water level in the SG, the difference between feedwater flow and steam flow is evaluated to determine if feedwater flow is significantly less than steam flow. With less feedwater flow than steam flow, SG level will decrease at a rate dependent upon the magnitude of the difference in flow rates. There are two SG level channels and two Steam Flow/Feedwater Flow Mismatch channels per SG. One narrow range level channel sensing a low level coincident with one Steam Flow/Feedwater Flow Mismatch channel sensing flow mismatch (steam flow greater than feed flow) will actuate a reactor trip.

The LCO requires two channels of SG Water Level - Low coincident with Steam Flow/Feedwater Flow Mismatch to be OPERABLE.

In MODE 1 or 2, when the reactor requires a heat sink, the SG Water Level - Low coincident with Steam Flow/ Feedwater Flow Mismatch trip must be OPERABLE. The normal source of water for the SGs is the MFW System (not safety related). The MFW System is in operation in MODE 1 or 2. The AFW System is the safety related backup source of water to ensure that the SGs remain the heat sink for the reactor. During normal startups and shutdowns, the MFW System provides feedwater to

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

14. Steam Generator Water Level-Low, Coincident With Steam Flow/Feedwater Flow Mismatch (continued)

maintain SG level. In MODE 3, 4, 5, or 6, the SG Water Level - Low coincident with Steam Flow/Feedwater Flow Mismatch Function does not have to be OPERABLE because the reactor is not operating or even critical. Decay heat removal is accomplished by the AFW and MFW Systems in MODE 3 and by the RHR System in MODE 4, 5, or 6. The MFW System is in operation only in MODE 1 or 2 and, therefore, this trip Function need only be OPERABLE in these MODES.

15. Turbine Trip

a. Turbine Trip—Low Auto-Stop Oil Pressure

The Turbine Trip - Low Auto-Stop Oil Pressure trip Function anticipates the loss of heat removal capabilities of the secondary system following a turbine trip. This trip Function acts to minimize the pressure/temperature transient on the reactor. Any turbine trip from a power level below the P-7 setpoint, approximately 10% power, will not actuate a reactor trip. Three pressure switches monitor the auto-stop oil pressure in the Turbine Trip System. A low pressure condition sensed by two-out-of-three pressure switches will actuate a reactor trip. These pressure switches do not provide any input to the control system. The unit is designed to withstand a complete loss of load and not sustain core damage or challenge the RCS pressure limitations. Core protection is provided by the Pressurizer Pressure - High trip Function and RCS integrity is ensured by the pressurizer safety valves.

The LCO requires three channels of Turbine Trip - Low Auto-Stop Oil Pressure to be OPERABLE in MODE 1 above P-7.

Below the P-7 setpoint, a turbine trip does not actuate a reactor trip. In MODE 3, 4, 5, or 6, there is no potential for a turbine trip, and the Turbine Trip - Low Auto-Stop Oil Pressure trip Function does not need to be OPERABLE.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

b. Turbine Trip—Turbine Stop Valve Closure

The Turbine Trip – Turbine Stop Valve Closure trip Function anticipates the loss of heat removal capabilities of the secondary system following a turbine trip from a power level above the P-7 setpoint, approximately 10% power. This action will actuate a reactor trip. The trip Function anticipates the loss of secondary heat removal capability that occurs when the stop valves close. Tripping the reactor in anticipation of loss of secondary heat removal acts to minimize the pressure and temperature transient on the reactor. This trip Function will not and is not required to operate in the presence of a single channel failure. The unit is designed to withstand a complete loss of load and not sustain core damage or challenge the RCS pressure limitations. Core protection is provided by the Pressurizer Pressure – High trip Function, and RCS integrity is ensured by the pressurizer safety valves. This trip Function is diverse to the Turbine Trip – Low Auto-Stop Oil Pressure trip Function. Each turbine stop valve is equipped with one limit switch that inputs to the RPS. If both limit switches indicate that the stop valves are closed, a reactor trip is initiated.

The limit switches are set to assure channel trip occurs when the associated stop valve is closed.

The LCO requires two Turbine Trip – Turbine Stop Valve Closure channels, one per valve, to be OPERABLE in MODE 1 above P-7. Both channels must trip to cause reactor trip.

Below the P-7 setpoint, a load rejection can be accommodated by the Steam Dump System. In MODE 3, 4, 5, or 6, there is no potential for a load rejection, and the Turbine Trip – Stop Valve Closure trip Function does not need to be OPERABLE.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

16. Safety Injection Input from Engineered Safety Feature Actuation System

The SI Input from ESFAS ensures that if a reactor trip has not already been generated by the RPS, the ESFAS automatic actuation logic will initiate a reactor trip upon any signal that initiates SI. This is a condition of acceptability for the LOCA. However, other transients and accidents take credit for varying levels of ESF performance and rely upon rod insertion, except for the most reactive rod that is assumed to be fully withdrawn, to ensure reactor shutdown. Therefore, a reactor trip is initiated every time an SI signal is present.

Trip Setpoint and Allowable Values are not applicable to this Function. The SI Input is provided by relay in the ESFAS. Therefore, there is no measurement signal with which to associate an LSSS.

The LCO requires two trains of SI Input from ESFAS to be OPERABLE in MODE 1 or 2.

A reactor trip is initiated every time an SI signal is present. Therefore, this trip Function must be OPERABLE in MODE 1 or 2, when the reactor is critical, and must be shut down in the event of an accident. In MODE 3, 4, 5, or 6, the reactor is not critical, and this trip Function does not need to be OPERABLE.

17. Reactor Protection System Interlocks

Reactor protection interlocks are provided to ensure reactor trips are in the correct configuration for the current unit status. They back up operator actions to ensure protection system Functions are not bypassed during unit conditions under which the safety analysis assumes the Functions are not bypassed. Therefore, the interlock Functions do not need to be OPERABLE when the associated reactor trip functions are outside the applicable MODES. These are:

a. Intermediate Range Neutron Flux, P-6

The Intermediate Range Neutron Flux, P-6 interlock is actuated when any NIS intermediate range

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

a. Intermediate Range Neutron Flux, P-6 (continued)

channel goes approximately one decade above the minimum channel reading. If both channels drop below the setpoint, the permissive will automatically be defeated. The LCO requirement for the P-6 interlock ensures that the following Functions are performed:

- on increasing power, the P-6 interlock allows the manual block of the NIS Source Range, Neutron Flux reactor trip. This prevents a premature block of the source range trip and allows the operator to ensure that the intermediate range is OPERABLE prior to leaving the source range. When the source range trip is blocked, the high voltage to the detectors is also removed; and
- on decreasing power, the P-6 interlock automatically energizes the NIS source range detectors and enables the NIS Source Range Neutron Flux reactor trip.

The LCO requires two channels of Intermediate Range Neutron Flux, P-6 interlock to be OPERABLE in MODE 2 when below the P-6 interlock setpoint.

Above the P-6 interlock setpoint, the NIS Source Range Neutron Flux reactor trip will be blocked, and this Function will no longer be necessary.

In MODE 3, 4, 5, or 6, the P-6 interlock does not have to be OPERABLE because the NIS Source Range is providing core protection.

b. Low Power Reactor Trips Block, P-7

The Low Power Reactor Trips Block, P-7 interlock is actuated by input from either the Power Range Neutron Flux, P-10, or the Turbine Impulse Pressure interlock. The LCO requirement for the P-7 interlock ensures that the following Functions are performed:

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

b. Low Power Reactor Trips Block, P-7 (continued)

(1) on increasing power, the P-7 interlock automatically enables reactor trips on the following Functions:

- Pressurizer Pressure – Low;
- Pressurizer Water Level – High;
- Reactor Coolant Flow – Low (Two Loops);
- RCPs Breaker Open (Two Loops);
- Undervoltage RCPs; and
- Turbine Trip.

These reactor trips are only required when operating above the P-7 setpoint (approximately 10% power). The reactor trips provide protection against violating the DNBR limit. Below the P-7 setpoint, the RCS is capable of providing sufficient natural circulation without any RCP running.

(2) on decreasing power, the P-7 interlock automatically blocks reactor trips on the following Functions:

- Pressurizer Pressure – Low;
- Pressurizer Water Level – High;
- Reactor Coolant Flow – Low (Two Loops);
- RCP Breaker Position (Two Loops);
- Undervoltage RCPs; and
- Turbine Trip.

Trip Setpoint and Allowable Value are not applicable to the P-7 interlock because it is a logic Function and thus has no parameter with which to associate an LSSS.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

b. Low Power Reactor Trips Block, P-7 (continued)

The P-7 interlock is a logic Function with train and not channel identity. Therefore, the LCO requires one channel per train of Low Power Reactor Trips Block, P-7 interlock to be OPERABLE in MODE 1.

The low power trips are blocked below the P-7 setpoint and unblocked above the P-7 setpoint. In MODE 2, 3, 4, 5, or 6, this Function does not have to be OPERABLE because the interlock performs its Function when power level drops below 10% power, which is in MODE 1.

c. Power Range Neutron Flux, P-8

The Power Range Neutron Flux, P-8 interlock is actuated at approximately 40% power as determined by two-out-of-four NIS power range detectors. The P-8 interlock automatically enables the Reactor Coolant Flow—Low (Single Loop) and RCP Breaker Position (Single Loop) reactor trips on low flow in one or more RCS loops on increasing power. The LCO requirement for this trip Function ensures that protection is provided against a loss of flow in any RCS loop that could result in DNB conditions in the core when greater than approximately 40% power. On decreasing power, the reactor trip on low flow in any loop is automatically blocked.

The LCO requires four channels of Power Range Neutron Flux, P-8 interlock to be OPERABLE in MODE 1. In MODE 1, a loss of flow in one RCS loop could result in DNB conditions, so the Power Range Neutron Flux, P-8 interlock must be OPERABLE. In MODE 2, 3, 4, 5, or 6, this Function does not have to be OPERABLE because the core is not producing sufficient power to be concerned about DNB conditions.

d. Power Range Neutron Flux, P-10

The Power Range Neutron Flux, P-10 interlock is actuated at approximately 10% power, as

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

d. Power Range Neutron Flux, P-10 (continued)

determined by two-out-of-four NIS power range detectors. If power level falls below 10% RTP on 3 of 4 channels, the power range low flux and intermediate range high flux trips will be automatically unblocked. The LCO requirement for the P-10 interlock ensures that the following Functions are performed:

- on increasing power, the P-10 interlock allows the operator to manually block the Intermediate Range Neutron Flux reactor trip. Note that blocking the reactor trip also blocks the signal to prevent automatic and manual rod withdrawal;
- on increasing power, the P-10 interlock allows the operator to manually block the Power Range Neutron Flux–Low reactor trip;
- on increasing power, the P-10 interlock automatically provides a backup signal to block the Source Range Neutron Flux reactor trip, and also to de-energize the NIS source range detectors;
- the P-10 interlock provides one of the two inputs to the P-7 interlock; and
- on decreasing power, the P-10 interlock automatically enables the Power Range Neutron Flux–Low reactor trip and the Intermediate Range Neutron Flux reactor trip (and rod stop).

The LCO requires four channels of Power Range Neutron Flux, P-10 interlock to be OPERABLE in MODE 1 or 2.

OPERABILITY in MODE 1 ensures the Function is available to perform its decreasing power Functions in the event of a reactor shutdown. This Function must be OPERABLE in MODE 2 to ensure that core protection is provided during a startup or shutdown by the Power Range Neutron Flux–Low

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

d. Power Range Neutron Flux, P-10 (continued)

and Intermediate Range Neutron Flux reactor trips. In MODE 3, 4, 5, or 6, this Function does not have to be OPERABLE because the reactor is not at power and the Source Range Neutron Flux reactor trip provides core protection.

e. Turbine Impulse Pressure

The Turbine Impulse Pressure sends a signal to P-7 when the pressure in the first stage of the high pressure turbine is greater than approximately 10% of the rated full power pressure. This is determined by one-out-of-two pressure detectors. The LCO requirement for this Function ensures that one of the inputs to the P-7 interlock is available. The LCO requires two channels of Turbine Impulse Pressure to be OPERABLE in MODE 1.

The Turbine Impulse Pressure input must be OPERABLE when the turbine generator is operating. The Function is not required OPERABLE in MODE 2, 3, 4, 5, or 6 because the turbine generator is not electrically loaded.

18. Reactor Trip Breakers

This trip Function applies to the RTBs exclusive of individual trip mechanisms. The LCO requires two OPERABLE trains of trip breakers. A trip breaker train consists of a trip breaker and bypass breaker associated with a single RPS logic train that are racked in, closed, and capable of supplying power to the CRD System. Thus, the train may consist of the main breaker with the associated bypass breaker racked out or removed, or main breaker and bypass breaker, from a single train when one train is out of service in accordance with LCO 3.3.1 ACTIONS. Two OPERABLE trains ensure no single random failure can disable the RPS trip capability.

These trip Functions must be OPERABLE in MODE 1 or 2 when the reactor is critical. In MODE 3, 4, or 5,

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

18. Reactor Trip Breakers (continued)

these RPS trip Functions must be OPERABLE when the RTBs or associated bypass breakers are closed.

19. Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms

The LCO requires both the Undervoltage and Shunt Trip Mechanisms to be OPERABLE for each RTB that is in service. The trip mechanisms are not required to be OPERABLE for trip breakers that are open, racked out, incapable of supplying power to the CRD System, or declared inoperable under Function 18 above. OPERABILITY of both trip mechanisms on each breaker ensures that no single trip mechanism failure will prevent opening any breaker on a valid signal.

These trip Functions must be OPERABLE in MODE 1 or 2 when the reactor is critical. In MODE 3, 4, or 5, these RPS trip Functions must be OPERABLE when the RTBs and associated bypass breakers are closed.

20. Automatic Trip Logic

The LCO requirement for the RTBs (Functions 18 and 19) and Automatic Trip Logic (Function 20) ensures that means are provided to interrupt the power to allow the rods to fall into the reactor core. Each RTB is equipped with an undervoltage coil and a shunt trip coil to trip the breaker open when needed. Each RTB is equipped with a bypass breaker to allow testing of the trip breaker while the unit is at power. The reactor trip signals generated by the RPS Automatic Trip Logic cause the RTBs and associated bypass breakers to open and shut down the reactor.

The LCO requires two trains of RPS Automatic Trip Logic to be OPERABLE. Having two OPERABLE channels ensures that random failure of a single logic channel will not prevent reactor trip.

These trip Functions must be OPERABLE in MODE 1 or 2 when the reactor is critical. In MODE 3, 4, or 5,

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

20. Automatic Trip Logic (continued)

these RPS trip Functions must be OPERABLE when the RTBs and associated bypass breakers are closed.

The RPS instrumentation satisfies Criterion 3 of the NRC Policy Statement.

ACTIONS

A Note has been added to the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed in Table 3.3.1-1.

In the event a channel's Trip Setpoint is found nonconservative with respect to the Allowable Value, or the transmitter, instrument loop, signal processing electronics, or bistable is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the LCO Condition(s) entered for the protection Function(s) affected.

When the number of inoperable channels in a trip Function exceed those specified in one or other related Conditions associated with a trip Function, then the unit is outside the safety analysis. Therefore, LCO 3.0.3 must be immediately entered if applicable in the current MODE of operation.

A.1

Condition A applies to all RPS protection Functions. Condition A addresses the situation where one or more required channels for one or more Functions are inoperable at the same time. The Required Action is to refer to Table 3.3.1-1 and to take the Required Actions for the protection functions affected. The Completion Times are those from the referenced Conditions and Required Actions.

(continued)

BASES

ACTIONS (continued)

B.1, B.2.1, and B.2.2

Condition B applies to the Manual Reactor Trip in MODE 1 or 2. This action addresses the train orientation of the RPS for this Function. With one channel inoperable, the inoperable channel must be restored to OPERABLE status within 48 hours. In this Condition, the remaining OPERABLE channel is adequate to perform the safety function.

The Completion Time of 48 hours is reasonable considering that there are two automatic actuation trains and another manual initiation channel OPERABLE, and the low probability of an event occurring during this interval.

If the Manual Reactor Trip Function cannot be restored to OPERABLE status within the allowed 48 hour Completion Time, the unit must be brought to a MODE in which the requirement does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 additional hours (54 hours total time) followed by opening the RTBs within 1 additional hour (55 hours total time). The 6 additional hours to reach MODE 3 and the 1 hour to open the RTBs are reasonable, based on operating experience, to reach MODE 3 and open the RTBs from full power operation in an orderly manner and without challenging unit systems. With the RTBs open and the unit in MODE 3, this trip Function is no longer required to be OPERABLE.

C.1 and C.2

Condition C applies to the following reactor trip Functions in MODE 3, 4, or 5 with the RTBs closed:

- Manual Reactor Trip;
- RTBs;
- RTB Undervoltage and Shunt Trip Mechanisms; and
- Automatic Trip Logic.

This action addresses the train orientation of the RPS for these Functions. With one channel or train inoperable, the inoperable channel or train must be restored to OPERABLE

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

status within 48 hours. If the affected Function(s) cannot be restored to OPERABLE status within the allowed 48 hour Completion Time, the unit must be placed in a MODE in which the requirement does not apply. To achieve this status, the RTBs must be opened within the next hour. The additional hour provides sufficient time to accomplish the action in an orderly manner. With the RTBs open, these Functions are no longer required.

The Completion Time is reasonable considering that in this Condition, the remaining OPERABLE train is adequate to perform the safety function, and given the low probability of an event occurring during this interval.

D.1.1, D.1.2, D.2.1, D.2.2, and D.3

Condition D applies to the Power Range Neutron Flux–High Function.

The NIS power range detectors provide a two-out-of-four trip logic. A known inoperable channel must be placed in the tripped condition. This results in a partial trip condition requiring only one-out-of-three logic for actuation. The 6 hours allowed to place the inoperable channel in the tripped condition is justified in WCAP-10271-P-A (Ref. 7).

In addition to placing the inoperable channel in the tripped condition, THERMAL POWER must be reduced to ≤ 75% RTP within 12 hours. Reducing the power level prevents operation of the core with radial power distributions beyond the design limits. With one of the NIS power range detectors inoperable, 1/4 of the radial power distribution monitoring capability is lost.

As an alternative to the above actions, the inoperable channel can be placed in the tripped condition within 6 hours and the QPTR monitored once every 12 hours as per SR 3.2.4.2, QPTR verification. Calculating QPTR every 12 hours compensates for the lost monitoring capability due to the inoperable NIS power range channel and allows continued unit operation at power levels ≥ 75% RTP. The 6 hour Completion Time and the 12 hour Frequency are

(continued)

BASES

ACTIONS

D.1.1, D.1.2, D.2.1, D.2.2, and D.3 (continued)

consistent with LCO 3.2.4, "QUADRANT POWER TILT RATIO (QPTR)."

As an alternative to the above Actions, the plant must be placed in a MODE where this Function is no longer required OPERABLE. Twelve hours are allowed to place the plant in MODE 3. This is a reasonable time, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging plant systems. If Required Actions cannot be completed within their allowed Completion Times, LCO 3.0.3 must be entered.

Required Action D.2.2 has been modified by a Note which only requires SR 3.2.4.2 to be performed if the Power Range Neutron Flux input to QPTR becomes inoperable. Failure of a component in the Power Range Neutron Flux Channel which renders the High Flux Trip Function inoperable may not affect the capability to monitor QPTR. As such, determining QPTR using the movable incore detectors once per 12 hours may not be necessary.

E.1 and E.2

Condition E applies to the following reactor trip Functions:

- Power Range Neutron Flux – Low;
- Overtemperature ΔT;
- Overpower ΔT;
- Pressurizer Pressure – High;
- SG Water Level – Low Low; and
- SG Water Level – Low coincident with Steam Flow/ Feedwater Flow Mismatch.

A known inoperable channel must be placed in the tripped condition within 6 hours. Placing the channel in the tripped condition results in a partial trip condition requiring only one-out-of-two logic for actuation of the two-out-of-three trips and one-out-of-three logic for

(continued)

BASES

ACTIONS

E.1 and E.2 (continued)

actuation of the two-out-of-four trips. The 6 hours allowed to place the inoperable channel in the tripped condition is justified in Reference 8.

If the inoperable channel cannot be placed in the trip condition within the specified Completion Time, the unit must be placed in a MODE where these Functions are not required OPERABLE. An additional 6 hours is allowed to place the unit in MODE 3. Six hours is a reasonable time, based on operating experience, to place the unit in MODE 3 from full power in an orderly manner and without challenging unit systems.

F.1 and F.2

Condition F applies to the Intermediate Range Neutron Flux trip when THERMAL POWER is above the P-6 setpoint and below the P-10 setpoint and one channel is inoperable. Above the P-6 setpoint and below the P-10 setpoint, the NIS intermediate range detector performs the monitoring Functions. If THERMAL POWER is greater than the P-6 setpoint but less than the P-10 setpoint, 2 hours is allowed to reduce THERMAL POWER below the P-6 setpoint or increase to THERMAL POWER above the P-10 setpoint. The NIS Intermediate Range Neutron Flux channels must be OPERABLE when the power level is above the capability of the source range, P-6, and below the capability of the power range, P-10. If THERMAL POWER is greater than the P-10 setpoint, the NIS power range detectors perform the monitoring and protection functions and the intermediate range is not required. The Completion Times allow for a slow and controlled power adjustment above P-10 or below P-6 and take into account the redundant capability afforded by the redundant OPERABLE channel, and the low probability of its failure during this period. This action does not require the inoperable channel to be tripped because the Function uses one-out-of-two logic. Tripping one channel would trip the reactor. Thus, the Required Actions specified in this Condition are only applicable when channel failure does not result in reactor trip.

(continued)

BASES

ACTIONS (continued)

G.1 and G.2

Condition G applies to two inoperable Intermediate Range Neutron Flux trip channels in MODE 2 when THERMAL POWER is above the P-6 setpoint and below the P-10 setpoint. Required Actions specified in this Condition are only applicable when channel failures do not result in reactor trip. Above the P-6 setpoint and below the P-10 setpoint, the NIS intermediate range detector performs the monitoring Functions. With no intermediate range channels OPERABLE, the Required Actions are to suspend operations involving positive reactivity additions immediately. This will preclude any power level increase since there are no OPERABLE Intermediate Range Neutron Flux channels. The operator must also reduce THERMAL POWER below the P-6 setpoint within two hours. Below P-6, the Source Range Neutron Flux channels will be able to monitor the core power level. The Completion Time of 2 hours will allow a slow and controlled power reduction to less than the P-6 setpoint and takes into account the low probability of occurrence of an event during this period that may require the protection afforded by the NIS Intermediate Range Neutron Flux trip.

H.1

Condition H applies to the Intermediate Range Neutron Flux trip when THERMAL POWER is below the P-6 setpoint and one or two channels are inoperable. Below the P-6 setpoint, the NIS source range performs the monitoring and protection functions. The inoperable NIS intermediate range channel(s) must be returned to OPERABLE status prior to increasing power above the P-6 setpoint. The NIS intermediate range channels must be OPERABLE when the power level is above the capability of the source range, P-6, and below the capability of the power range, P-10.

I.1

Condition I applies to one inoperable Source Range Neutron Flux trip channel when in MODE 2, below the P-6 setpoint. With the unit in this Condition, below P-6, the NIS source range performs the monitoring and protection functions. With one of the two channels inoperable, operations

(continued)

BASES

ACTIONS

I.1 (continued)

involving positive reactivity additions shall be suspended immediately.

This will preclude any power escalation. With only one source range channel OPERABLE, core protection is severely reduced and any actions that add positive reactivity to the core must be suspended immediately.

J.1

Condition J applies to two inoperable Source Range Neutron Flux trip channels when in MODE 2, below the P-6 setpoint, or in MODE 3, 4, or 5 with the RTBs closed. With the unit in this Condition, below P-6, the NIS source range performs the monitoring and protection functions. With both source range channels inoperable, the RTBs must be opened immediately. With the RTBs open, the core is in a more stable condition and the unit enters Condition L.

K.1 and K.2

Condition K applies to one inoperable source range channel in MODE 3, 4, or 5 with the RTBs closed. With the unit in this Condition, below P-6, the NIS source range performs the monitoring and protection functions. With one of the source range channels inoperable, 48 hours is allowed to restore it to an OPERABLE status. If the channel cannot be returned to an OPERABLE status, 1 additional hour is allowed to open the RTBs. Once the RTBs are open, the core is in a more stable condition and the unit enters Condition L. The allowance of 48 hours to restore the channel to OPERABLE status, and the additional hour to open the RTBs, are justified in Reference 8.

L.1, L.2, and L.3

Condition L applies when the required number of OPERABLE Source Range Neutron Flux channels is not met in MODE 3, 4, or 5 with the RTBs open. With the unit in this Condition, the NIS source range performs the monitoring and protection functions. With less than the required number of source

(continued)

BASES

ACTIONS

L.1, L.2, and L.3 (continued)

range channels OPERABLE, operations involving positive reactivity additions shall be suspended immediately. This will preclude any power escalation. In addition to suspension of positive reactivity additions, all valves that could add unborated water to the RCS must be closed within 1 hour as specified in LCO 3.9.2. The isolation of unborated water sources will preclude a boron dilution accident.

Also, the SDM must be verified within 1 hour and once every 12 hours thereafter as per SR 3.1.1.1, SDM verification. With no source range channels OPERABLE, core protection is severely reduced. Verifying the SDM within 1 hour allows sufficient time to perform the calculations and determine that the SDM requirements are met. The SDM must also be verified once per 12 hours thereafter to ensure that the core reactivity has not changed. Required Action L.1 precludes any positive reactivity additions; therefore, core reactivity should not be increasing, and a 12 hour Frequency is adequate. The Completion Times of within 1 hour and once per 12 hours are based on operating experience in performing the Required Actions and the knowledge that unit conditions will change slowly.

M.1 and M.2

Condition M applies to the following reactor trip Functions:

- Pressurizer Pressure – Low;
- Pressurizer Water Level – High;
- Reactor Coolant Flow – Low (Two Loops);
- RCP Breaker Position (Two Loops);
- Undervoltage RCPs; and
- Underfrequency RCPs.

With one channel inoperable, the inoperable channel must be placed in the tripped condition within 6 hours. Placing the channel in the tripped condition results in a partial trip

(continued)

BASES

ACTIONS

M.1 and M.2 (continued)

condition requiring only one additional channel to initiate a reactor trip above the P-7 setpoint and below the P-8 setpoint. These Functions do not have to be OPERABLE below the P-7 setpoint because there are no loss of flow trips below the P-7 setpoint. The 6 hours allowed to place the channel in the tripped condition is justified in Reference 7. An additional 6 hours is allowed to reduce THERMAL POWER to below P-7 if the inoperable channel cannot be restored to OPERABLE status or placed in trip within the specified Completion Time.

Allowance of this time interval takes into consideration the redundant capability provided by the remaining redundant OPERABLE channel, and the low probability of occurrence of an event during this period that may require the protection afforded by the Functions associated with Condition M.

N.1 and N.2

Condition N applies to the Reactor Coolant Flow—Low (Single Loop) reactor trip Function. With one channel inoperable, the inoperable channel must be placed in trip within 6 hours. If the channel cannot be restored to OPERABLE status or the channel placed in trip within the 6 hours, then THERMAL POWER must be reduced below the P-8 setpoint within the next 4 hours. This places the unit in a MODE where the LCO is no longer applicable. This trip Function does not have to be OPERABLE below the P-8 setpoint because other RPS trip Functions provide core protection below the P-8 setpoint. The 6 hours allowed to restore the channel to OPERABLE status or place in trip and the 4 additional hours allowed to reduce THERMAL POWER to below the P-8 setpoint are justified in Reference 7.

O.1 and O.2

Condition O applies to the RCP Breaker Position (Single Loop) reactor trip Function. There is one breaker position device per RCP breaker. With one channel inoperable, the inoperable channel must be restored to OPERABLE status within 6 hours. If the channel cannot be restored to OPERABLE status within the 6 hours, then THERMAL POWER must

(continued)

BASES

ACTIONS

O.1 and O.2 (continued)

be reduced below the P-8 setpoint within the next 4 hours. This places the unit in a MODE where the LCO is no longer applicable. This Function does not have to be OPERABLE below the P-8 setpoint because other RPS Functions provide core protection below the P-8 setpoint. The 6 hours allowed to restore the channel to OPERABLE status and the 4 additional hours allowed to reduce THERMAL POWER to below the P-8 setpoint are justified in Reference 7.

P.1 and P.2

Condition P applies to Turbine Trip on Low Auto-Stop Oil Pressure or on Turbine Stop Valve Closure. With one channel inoperable, the inoperable channel must be placed in the trip condition within 6 hours. If placed in the tripped condition, this results in a partial trip condition requiring only one additional channel to initiate a reactor trip. If the channel cannot be restored to OPERABLE status or placed in the trip condition, then power must be reduced below the P-7 setpoint within the next 4 hours. The 6 hours allowed to place the inoperable channel in the tripped condition and the 4 hours allowed for reducing power are justified in Reference 7.

Q.1 and Q.2

Condition Q applies to the SI Input from ESFAS reactor trip and the RPS Automatic Trip Logic in MODES 1 and 2. These actions address the train orientation of the RPS for these Functions. With one train inoperable, 6 hours are allowed to restore the train to OPERABLE status (Required Action Q.1) or the unit must be placed in MODE 3 within the next 6 hours. The Completion Time of 6 hours (Required Action Q.1) is reasonable considering that in this Condition, the remaining OPERABLE train is adequate to perform the safety function and given the low probability of an event during this interval. The Completion Time of 6 hours (Required Action Q.2) is reasonable, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems.

(continued)

BASES

ACTIONS

Q.1 and Q.2 (continued)

The Required Actions have been modified by a Note that allows bypassing one train up to 12 hours for maintenance or surveillance testing, provided the other train is OPERABLE.

R.1 and R.2

Condition R applies to the RTBs in MODES 1 and 2. These actions address the train orientation of the RPS for the RTBs. With one train inoperable, 1 hour is allowed to restore the train to OPERABLE status or the unit must be placed in MODE 3 within the next 6 hours. The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems. The 1 hour and 6 hour Completion Times are equal to the time allowed by LCO 3.0.3 for shutdown actions in the event of a complete loss of RPS function. Placing the unit in MODE 3 removes the requirement for this particular Function.

The Required Actions have been modified by a Note which allows one channel to be bypassed for up to 12 hours for maintenance or surveillance testing, provided the other channel is OPERABLE.

S.1 and S.2

Condition S applies to the P-6 and P-10 interlocks. With one channel inoperable for one-out-of-two or two-out-of-four coincidence logic, the associated interlock must be verified to be in its required state for the existing unit condition within 1 hour or the unit must be placed in MODE 3 within the next 6 hours. Verifying the interlock status manually accomplishes the interlock's Function. The Completion Time of 1 hour is based on operating experience and the minimum amount of time allowed for manual operator actions. The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems. The 1 hour and 6 hour Completion Times are equal to the time allowed by LCO 3.0.3 for shutdown actions in the event of a complete loss of RPS Function.

(continued)

BASES

ACTIONS (continued)

T.1 and T.2

Condition T applies to the P-7, P-8, and Turbine Impulse Pressure inputs. With one channel inoperable for one-out-of-two or two-out-of-four coincidence logic, the associated interlock must be verified to be in its required state for the existing unit condition within 1 hour or the unit must be placed in MODE 2 within the next 6 hours. These actions are conservative for the case where power level is being raised. Verifying the interlock status manually accomplishes the interlock's Function. The Completion Time of 1 hour is based on operating experience and the minimum amount of time allowed for manual operator actions. The Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 2 from full power in an orderly manner and without challenging unit systems.

U.1, U.2.1, and U.2.2

Condition U applies to the RTB Undervoltage and Shunt Trip Mechanisms, or diverse trip features, in MODES 1 and 2. With one of the diverse trip features inoperable, it must be restored to an OPERABLE status within 48 hours or the unit must be placed in a MODE where the requirement does not apply. This is accomplished by placing the unit in MODE 3 within the next 6 hours (54 hours total time) followed by opening the RTBs in 1 additional hour (55 hours total time). The Completion Time of 6 hours is a reasonable time, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems. With the RTBs open and the unit in MODE 3, this trip Function is no longer required to be OPERABLE. The affected RTB should not be bypassed while one of the diverse features is inoperable except for the time required to perform maintenance to one of the diverse features. The allowable time for performing maintenance or surveillance testing the diverse features is 12 hours for the reasons stated under Condition R.

The Completion Time of 48 hours for Required Action U.1 is reasonable considering that in this Condition there is one remaining diverse feature for the affected RTB, and one OPERABLE RTB capable of performing the safety function and

(continued)

BASES

ACTIONS

U.1, U.2.1, and U.2.2 (continued)

given the low probability of an event occurring during this interval.

V.1

With two RPS trains inoperable, no automatic capability is available to shut down the reactor, and immediate plant shutdown in accordance with LCO 3.0.3 is required.

SURVEILLANCE REQUIREMENTS

The SRs for each RPS Function are identified by the SRs column of Table 3.3.1-1 for that Function.

A Note has been added to the SR Table stating that Table 3.3.1-1 determines which SRs apply to which RPS Functions.

Note that each channel of process protection supplies both trains of the RPS. When testing Channel I, Train A and Train B must be examined. Similarly, Train A and Train B must be examined when testing Channel II, Channel III, and Channel IV (if applicable). The CHANNEL CALIBRATION and COTs are performed in a manner that is consistent with the assumptions used in analytically calculating the required channel accuracies.

SR 3.3.1.1

Performance of the CHANNEL CHECK once every 12 hours ensures that gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1 (continued)

Deviation criteria are determined by the unit staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.1.2

SR 3.3.1.2 compares the calorimetric heat balance calculation to the NIS channel output every 24 hours. If the calorimetric exceeds the NIS channel output by > 2% RTP, the NIS is not declared inoperable, but must be adjusted. If the NIS channel output cannot be properly adjusted, the channel is declared inoperable.

Two Notes modify SR 3.3.1.2. The first Note indicates that the NIS channel output shall be adjusted consistent with the calorimetric results if the absolute difference between the NIS channel output and the calorimetric is > 2% RTP. The second Note clarifies that this Surveillance is required only if reactor power is ≥ 15% RTP and that 12 hours are allowed for performing the first Surveillance after reaching 15% RTP. At lower power levels, calorimetric data are inaccurate.

The Frequency of every 24 hours is adequate. It is based on unit operating experience, considering instrument reliability and operating history data for instrument drift. Together these factors demonstrate the change in the absolute difference between NIS and heat balance calculated powers rarely exceeds 2% in any 24 hour period. In addition, control room operators periodically monitor redundant indications and alarms to detect deviations in channel outputs.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.3

SR 3.3.1.3 compares the incore system to the NIS channel output every 31 EFPD. If the absolute difference is ≥ 3%, the NIS channel is still OPERABLE, but must be readjusted.

If the NIS channel cannot be properly readjusted, the channel is declared inoperable. This Surveillance is performed to verify the f(ΔI) input to the overtemperature and overpower ΔT Functions.

Two Notes modify SR 3.3.1.3. Note 1 indicates that the excore NIS channel shall be adjusted if the absolute difference between the incore and excore AFD is ≥ 3%. Note 2 clarifies that the Surveillance is required only if reactor power is ≥ 15% RTP and that 36 hours is allowed for performing the first Surveillance after reaching 15% RTP.

The Frequency of every 31 EFPD is adequate. It is based on industry operating experience, considering instrument reliability and operating history data for instrument drift. Also, the slow changes in neutron flux during the fuel cycle can be detected during this interval.

SR 3.3.1.4

SR 3.3.1.4 is the performance of a TADOT every 31 days on a STAGGERED TEST BASIS. This test shall verify OPERABILITY by actuation of the end devices.

The RTB test shall include separate verification of the undervoltage and shunt trip mechanisms. Independent verification of RTB undervoltage and shunt trip Function is not required for the bypass breakers. No capability is provided for performing such a test at power. The independent test for bypass breakers is included in SR 3.3.1.14. The bypass breaker test shall include a local shunt trip. A Note has been added to indicate that this test must be performed on the bypass breaker prior to placing it in service.

The Frequency of every 31 days on a STAGGERED TEST BASIS is adequate. It is based on industry operating experience,

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.4 (continued)

considering instrument reliability and operating history data.

SR 3.3.1.5

SR 3.3.1.5 is the performance of an ACTUATION LOGIC TEST. The RPS is tested every 31 days on a STAGGERED TEST BASIS. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. All possible logic combinations, with and without applicable permissives, are tested for each protection function. The Frequency of every 31 days on a STAGGERED TEST BASIS is adequate. It is based on industry operating experience, considering instrument reliability and operating history data.

SR 3.3.1.6

SR 3.3.1.6 is a calibration of the excore channels to the incore channels. If the measurements do not agree, the excore channels are not declared inoperable but must be calibrated to agree with the incore detector measurements. If the excore channels cannot be adjusted, the channels are declared inoperable. This Surveillance is performed to verify the $f(\Delta I)$ input to the overtemperature and overpower ΔT Functions.

A Note modifies SR 3.3.1.6. The Note states that this Surveillance is required only if reactor power is > 50% RTP and that 24 hours is allowed for performing the first surveillance after reaching 50% RTP.

The Frequency of 92 EFPD is adequate. It is based on industry operating experience, considering instrument reliability and operating history data for instrument drift.

SR 3.3.1.7

SR 3.3.1.7 is the performance of a COT every 92 days.

A COT is performed on each required channel to ensure the entire channel will perform the intended Function.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.7 (continued)

Setpoints must be within the Allowable Values specified in Table 3.3.1-1.

The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology. The setpoint shall be left set consistent with the assumptions of the current unit specific setpoint methodology.

The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of Reference 7.

SR 3.3.1.7 is modified by a Note that provides a 4 hour delay in the requirement to perform this Surveillance for source range instrumentation when entering MODE 3 from MODE 2. This Note allows a normal shutdown to proceed without a delay for testing in MODE 2 and for a short time in MODE 3 until the RTBs are open and SR 3.3.1.7 is no longer required to be performed. If the unit is to be in MODE 3 with the RTBs closed for > 4 hours this Surveillance must be performed prior to 4 hours after entry into MODE 3.

The Frequency of 92 days is justified in Reference 7.

SR 3.3.1.8

SR 3.3.1.8 is the performance of a COT as described in SR 3.3.1.7, except it is modified by a Note that this test shall include verification that the P-6 and P-10 interlocks are in their required state for the existing unit condition. The Frequency is modified by a Note that allows this surveillance to be satisfied if it has been performed within 92 days of the Frequencies prior to reactor startup and four hours after reducing power below P-10 and P-6. The Frequency of "prior to startup" ensures this surveillance is performed prior to critical operations and applies to the source, intermediate and power range low instrument channels. The Frequency of "4 hours after reducing power below P-10" (applicable to intermediate and power range low channels) and "4 hours after reducing power below P-6" (applicable to source range channels) allows a normal shutdown to be completed and the unit removed from the MODE

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.8 (continued)

of Applicability for this surveillance without a delay to perform the testing required by this surveillance. The Frequency of every 92 days thereafter applies if the plant remains in the MODE of Applicability after the initial performances of prior to reactor startup and four hours after reducing power below P-10 or P-6. The MODE of Applicability for this surveillance is < P-10 for the power range low and intermediate range channels and < P-6 for the source range channels. Once the unit is in MODE 3, this surveillance is no longer required. If power is to be maintained < P-10 or < P-6 for more than 4 hours, then the testing required by this surveillance must be performed prior to the expiration of the 4 hour limit. Four hours is a reasonable time to complete the required testing or place the unit in a MODE where this surveillance is no longer required. This test ensures that the NIS source, intermediate, and power range low channels are OPERABLE prior to taking the reactor critical and after reducing power into the applicable MODE (< P-10 or < P-6) for periods > 4 hours.

SR 3.3.1.9

SR 3.3.1.9 is the performance of a TADOT and is performed every 92 days, as justified in Reference 7.

The SR is modified by a Note that excludes verification of setpoints from the TADOT. Since this SR applies to RCP undervoltage and underfrequency relays, setpoint verification requires elaborate bench calibration and is accomplished during the CHANNEL CALIBRATION.

SR 3.3.1.10

A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint methodology. The

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.10 (continued)

difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology.

The Frequency of 18 months is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint methodology.

SR 3.3.1.10 is modified by a Note stating that this test shall include verification that the time constants are adjusted to the prescribed values where applicable. This Note applies to those Functions equipped with electronic dynamic compensation. Not all Functions to which SR 3.3.1.10 is applicable are equipped with electronic dynamic compensation.

SR 3.3.1.11

SR 3.3.1.11 is the performance of a CHANNEL CALIBRATION, as described in SR 3.3.1.10, every 18 months. This SR is modified by a Note stating that neutron detectors are excluded from the CHANNEL CALIBRATION. The CHANNEL CALIBRATION for the power range neutron detectors consists of a normalization of the detectors based on a power calorimetric and flux map performed above 15% RTP. The CHANNEL CALIBRATION for the source range and intermediate range neutron detectors consists of obtaining the detector plateau or preamp discriminator curves, evaluating those curves, and comparing the curves to the manufacturer's data. This Surveillance is not required for the NIS power range detectors for entry into MODE 2 or 1, and is not required for the NIS intermediate range detectors for entry into MODE 2, because the unit must be in at least MODE 2 to perform the test for the intermediate range detectors and MODE 1 for the power range detectors. The 18 month Frequency is based on industry operating experience, considering instrument reliability and operating history data. Operating experience has shown these components usually pass the Surveillance when performed on the 18 month Frequency.

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BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.12

SR 3.3.1.12 is the performance of a CHANNEL CALIBRATION, as described in SR 3.3.1.10, every 18 months. For Table 3.3.1-1 Functions 5 and 6, the CHANNEL CALIBRATION shall include a narrow range RTD cross calibration. This SR is modified by a Note stating that this test shall include verification of the electronic dynamic compensation time constants and the RTD response time constants. The RCS narrow range temperature sensors response time shall be ≤ a 4.0 second lag time constant.

The Frequency is justified by the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.1.13

SR 3.3.1.13 is the performance of a COT of RPS interlocks every 18 months.

The Frequency is based on the known reliability of the interlocks and the multichannel redundancy available, and has been shown to be acceptable through operating experience.

SR 3.3.1.14

SR 3.3.1.14 is the performance of a TADOT of the Manual Reactor Trip, RCP Breaker Position, and the SI Input from ESFAS and the P-7 interlock. This TADOT is performed every 18 months. The test shall independently verify the OPERABILITY of the undervoltage and shunt trip mechanisms for the Manual Reactor Trip Function for the Reactor Trip Breakers and the undervoltage trip mechanism for the Reactor Trip Bypass Breakers.

The test shall also independently verify the OPERABILITY of the low power reactor trip block from the Power Range Neutron Flux (P-10) interlock and turbine first stage pressure. The TADOT verifies that when either the Turbine Impulse Pressure inputs or the Power Range Neutron Flux (P-10) interlock engage, reactor trips that are blocked by P-7 are enabled.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.14 (continued)

The Frequency is based on the known reliability of the Functions and the multichannel redundancy available, and has been shown to be acceptable through operating experience.

The SR is modified by a Note that excludes verification of setpoints from the TADOT. The Functions affected have no setpoints associated with them.

SR 3.3.1.15

SR 3.3.1.15 is the performance of a TADOT of Turbine Trip Functions. This TADOT is as described in SR 3.3.1.4, except that this test is performed prior to reactor startup. A Note states that this Surveillance is not required if it has been performed within the previous 31 days. Verification of the Trip Setpoint does not have to be performed for this Surveillance. Performance of this test will ensure that the turbine trip Function is OPERABLE prior to taking the reactor critical. This test cannot be performed with the reactor at power and must therefore be performed prior to reactor startup.

REFERENCES

1. UFSAR, Chapter 7.
2. UFSAR, Chapter 6.
3. UFSAR, Chapter 15.
4. UFSAR, Section 3.1.
5. IEEE-279-1968.
6. 10 CFR 50.49.
7. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.

B 3.3 INSTRUMENTATION

B 3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

BASES

BACKGROUND

The ESFAS initiates necessary safety systems, based on the values of selected unit parameters, to protect against violating core design limits and the Reactor Coolant System (RCS) pressure boundary, and to mitigate accidents.

The ESFAS instrumentation is segmented into three distinct but interconnected modules as identified below:

- Field transmitters or process sensors and instrumentation: provide a measurable electronic signal based on the physical characteristics of the parameter being measured;
- Signal processing equipment including analog protection system, field contacts, and protection channel sets: provide signal conditioning, bistable setpoint comparison, process algorithm actuation, compatible electrical signal output to protection system devices, and control board/control room/ miscellaneous indications; and
- ESFAS automatic initiation relay logic: initiates the proper unit shutdown or engineered safety feature (ESF) actuation in accordance with the defined logic and based on the bistable outputs from the signal process control and protection system.

Field Transmitters or Sensors

To meet the design demands for redundancy and reliability, more than one, and often as many as three, field transmitters or sensors are used to measure unit parameters. In many cases, field transmitters or sensors that input to the ESFAS are shared with the Reactor Protection System (RPS). In some cases, the same channels also provide control system inputs. To account for calibration tolerances and instrument drift, which are assumed to occur between calibrations, statistical allowances are provided in

(continued)

BASES

BACKGROUND

Field Transmitters or Sensors (continued)

the Trip Setpoint and Allowable Values. The OPERABILITY of each transmitter or sensor can be evaluated when its "as found" calibration data are compared against its documented acceptance criteria.

Signal Processing Equipment

Generally, three or four channels of process control equipment are used for the signal processing of unit parameters measured by the field instruments. The process control equipment provides signal conditioning, comparable output signals for instruments located on the main control board, and comparison of measured input signals with setpoints established by safety analyses. These setpoints are defined in UFSAR, Chapter 6 (Ref. 1), Chapter 7 (Ref. 2), and Chapter 15 (Ref. 3). If the measured value of a unit parameter exceeds the predetermined setpoint, an output from a bistable is forwarded to the ESFAS automatic initiation logic. Channel separation is maintained up to and through the input to the ESFAS automatic initiation logic.

The ESFAS automatic initiation instrumentation is designed in accordance with HBRSEP design criteria, which is described in UFSAR Section 3.1 (Ref. 4), and IEEE-279-1968 (Ref. 5).

Where a plant condition that requires protective action can be brought on by a failure or malfunction of the control system, and the same failure or malfunction prevents proper action of a protection system channel or channels designed to protect against the resultant unsafe condition, the remaining portions of the protection system will automatically initiate appropriate protective action whenever a plant condition monitored by the system reaches its trip setpoint. No single failure within the protection system will prevent proper protection system action when required. These requirements are described in Reference 5.

(continued)

BASES

BACKGROUND (continued)

Trip Setpoints and Allowable Values

The Trip Setpoints are the nominal values at which the bistables are set. Any bistable is considered to be properly adjusted when the "as left" value is within the band for CHANNEL CALIBRATION accuracy.

The Trip Setpoints used in the bistables are based on the analytical limits stated in Reference 2. The selection of these Trip Setpoints is such that adequate protection is provided when all sensor and processing time delays accounted for in setpoint calculations and accident analyses are taken into account. To allow for calibration tolerances, instrumentation uncertainties, instrument drift, and severe environment errors for those ESFAS channels that must function in harsh environments as defined by 10 CFR 50.49 (Ref. 6), the Trip Setpoints and Allowable Values specified in Table 3.3.2-1 in the accompanying LCO are conservatively adjusted with respect to the analytical limits. A detailed description of the methodology used to calculate the Trip Setpoints, including their explicit uncertainties, is provided in the company setpoint methodology procedure. The actual nominal Trip Setpoint entered into the bistable is more conservative than that specified by the Allowable Value to account for changes in random measurement errors detectable by a COT. One example of such a change in measurement error is drift during the surveillance interval. If the measured setpoint does not exceed the Allowable Value, the channel is considered OPERABLE.

Setpoints in accordance with the Allowable Value ensure that the consequences of Design Basis Accidents (DBAs) will be acceptable, providing the unit is operated from within the LCOs at the onset of the DBA and the equipment functions as designed.

Each channel can be tested on line to verify that the signal processing equipment and setpoint accuracy is within the specified allowance requirements of calculations performed in accordance with the company setpoint methodology procedure. Once a designated channel is taken out of service for testing, a simulated signal is injected in place of the field instrument signal. The process equipment for the channel in test is then tested, verified, and

(continued)

BASES

BACKGROUND

Trip Setpoints and Allowable Values (continued)

calibrated. SRs for the channels are specified in the SR section.

The Trip setpoints and Allowable Values listed in Table 3.3.2-1, are based on the methodology described in the company setpoint methodology procedure, which incorporates all of the applicable uncertainties for each channel. The magnitudes of these uncertainties are factored into the determination of each Trip Setpoint. All field sensors and signal processing equipment for these channels are assumed to operate within the allowances of these uncertainty magnitudes.

ESFAS Automatic Initiation Logic

The ESFAS relay logic equipment is used for the decision logic processing of outputs from the signal processing equipment bistables. To meet the redundancy requirements, two trains of logic, each performing the same functions, are provided. If one train is taken out of service for maintenance or test purposes, the second train will provide ESF actuation for the unit. Each train is packaged in cabinets for physical and electrical separation to satisfy separation and independence requirements.

The ESFAS relay logic performs the decision logic for most ESF equipment actuation; generates the electrical output signals that initiate the required actuation; and provides the status, permissive, and annunciator output signals to the main control room of the unit.

The bistable outputs from the signal processing equipment are sensed by the relay logic and combined into logic matrices that represent combinations indicative of various transients. If a required logic matrix combination is completed, the system will send actuation signals via master and slave relays to those components whose aggregate Function best serves to alleviate the condition and restore the unit to a safe condition. Examples are given in the Applicable Safety Analyses, LCO, and Applicability sections of this Bases.

(continued)

BASES

BACKGROUND

ESFAS Automatic Initiation Logic (continued)

The actuation of ESF components is accomplished through master and slave relays. The ESFAS relay logic energizes the master relays appropriate for the condition of the unit. Each master relay then energizes one or more slave relays, which then cause actuation of the end devices. The master relays are routinely tested for continuity after performance of the ACTUATION LOGIC TEST. Each master and slave relay is tested at a Frequency of 18 months by initiation of the Function.

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

Each of the analyzed accidents can be detected by one or more ESFAS Functions. One of the ESFAS Functions is the primary actuation signal for that accident. An ESFAS Function may be the primary actuation signal for more than one type of accident. An ESFAS Function may also be a secondary, or backup, actuation signal for one or more other accidents. For example, Pressurizer Pressure – Low is a primary actuation signal for small loss of coolant accidents (LOCAs) and a backup actuation signal for steam line breaks (SLBs) outside containment. Functions such as manual initiation, not specifically credited in the accident safety analysis, are qualitatively credited in the safety analysis and the NRC staff approved licensing basis for the unit. These Functions may provide protection for conditions that do not require dynamic transient analysis to demonstrate Function performance. These Functions may also serve as backups to Functions that were credited in the accident analysis (Ref. 3).

The LCO requires all instrumentation performing an ESFAS Function to be OPERABLE. Failure of any instrument renders the affected channel(s) inoperable and reduces the reliability of the affected Functions.

The LCO generally requires OPERABILITY of two or three channels in each instrumentation function and two channels in each logic and manual initiation function. The two-out-of-three configurations allow one channel to be tripped during maintenance or testing without causing an ESFAS initiation. Two logic or manual initiation channels are required to ensure no single random failure disables the ESFAS.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The required channels of ESFAS instrumentation provide unit protection in the event of any of the analyzed accidents. ESFAS protection functions are as follows:

1. Safety Injection

Safety Injection (SI) provides two primary functions:

1. Primary side water addition to ensure maintenance or recovery of reactor vessel water level (coverage of the active fuel for heat removal, clad integrity, and for limiting peak clad temperature to < 2200°F); and

2. Boration to ensure recovery and maintenance of SDM (k_{eff} < 1.0).

These functions are necessary to mitigate the effects of high energy line breaks (HELBs) both inside and outside of containment. The SI signal is also used to initiate other Functions such as:

- Phase A Isolation;
- Containment Ventilation Isolation;
- Reactor Trip;
- Feedwater Isolation;
- Start of motor driven auxiliary feedwater (AFW) pumps; and
- Control room ventilation pressurization mode activation.

These other functions ensure:

- Isolation of nonessential systems through containment penetrations;
- Trip of the reactor to limit power generation;
- Isolation of main feedwater (MFW) to limit secondary side mass losses;

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1. Safety Injection (continued)

- Start of AFW to ensure secondary side cooling capability; and
- Activation of the control room filtration system to ensure habitability.

a. Safety Injection – Manual Initiation

The LCO requires one channel per train to be OPERABLE. The operator can initiate SI at any time by using either of two pushbuttons in the control room. This action will cause actuation of all components in the same manner as any of the automatic actuation signals.

The LCO for the Manual Initiation Function ensures the proper amount of redundancy is maintained in the manual ESFAS actuation circuitry to ensure the operator has manual ESFAS initiation capability.

Each channel consists of one push button and the interconnecting wiring to the actuation logic cabinet. Each push button actuates both trains. This configuration does not allow testing at power.

b. Safety Injection – Automatic Actuation Logic and Actuation Relays

This LCO requires two trains to be OPERABLE. Actuation logic consists of all circuitry housed within the actuation subsystems, including the initiating relay contacts responsible for actuating the ESF equipment.

Manual and automatic initiation of SI must be OPERABLE in MODES 1, 2, 3, and 4 as indicated in Table 3.3.2-1. In these MODES, there is sufficient energy in the primary and secondary systems to warrant automatic initiation of ESF systems.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

b. Safety Injection - Automatic Actuation Logic and Actuation Relays (continued)

These Functions are not required to be OPERABLE in MODES 5 and 6 because there is adequate time for the operator to evaluate unit conditions and respond by manually starting individual systems, pumps, and other equipment to mitigate the consequences of an abnormal condition or accident. Unit pressure and temperature are very low and many ESF components are administratively locked out or otherwise prevented from actuating to prevent inadvertent overpressurization of unit systems.

c. Safety Injection - Containment Pressure - High

This signal provides protection against the following accidents:

- SLB inside containment;
- LOCA; and
- Feed line break inside containment.

Containment Pressure - High provides no input to any control functions. The transmitters (d/p cells) and electronics are located outside of containment with the sensing line (high pressure side of the transmitter) located inside containment.

Thus, the high pressure Function will not experience any adverse environmental conditions and the Trip Setpoint reflects only steady state instrument uncertainties.

Containment Pressure - High must be OPERABLE in MODES 1, 2, 3, and 4 when there is sufficient energy in the primary and secondary systems to pressurize the containment following a pipe break. In MODES 5, and 6, there is insufficient energy in the primary or secondary systems to pressurize the containment.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

d. Safety Injection - Pressurizer Pressure - Low

This signal provides protection against the following accidents:

- Inadvertent opening of a steam generator (SG) relief or safety valve;
- SLB;
- A spectrum of rod cluster control assembly ejection accidents (rod ejection);
- Inadvertent opening of a pressurizer relief or safety valve;
- LOCAs; and
- SG Tube Rupture.

Three channels of pressurizer pressure provide input into the ESFAS actuation logic. These channels initiate the ESFAS automatically when two of the three channels exceed the low pressure setpoint. These protection channels do not provide control functions; therefore the two-out-of-three logic is adequate to provide the required protection.

The transmitters are located inside containment, with the taps in the vapor space region of the pressurizer, and thus possibly experiencing adverse environmental conditions (LOCA, SLB inside containment, rod ejection). Therefore, the Trip Setpoint from which the Allowable Value is derived reflects the inclusion of both steady state and adverse environmental instrument uncertainties.

This Function must be OPERABLE in MODES 1, 2, and 3 (above 2000 psig) to mitigate the consequences of an HELB inside containment. This signal may be manually blocked by the operator below the 2000 psig setpoint. Automatic SI actuation below this pressure setpoint is then

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

d. Safety Injection - Pressurizer Pressure - Low (continued)

performed by the Containment Pressure - High signal.

This Function is not required to be OPERABLE in MODE 3 below the 2000 psig setpoint. Other ESF functions are used to detect accident conditions and actuate the ESF systems in this MODE. In MODES 4, 5, and 6, this Function is not needed for accident detection and mitigation.

e. Steam Line - High Differential Pressure Between Steam Header and Steam Lines

Steam Line - High Differential Pressure provides protection against the following accidents:

- SLB upstream of MSL check valves;
- Feed line break; and
- Inadvertent opening of an SG relief or an SG safety valve.

With the transmitters located away from the main steam headers, it is not possible for them to experience adverse environmental conditions during an SLB event. Therefore, the Trip Setpoint from which the Allowable Value is calculated reflects only steady state instrument uncertainties. Steam line high differential pressure must be OPERABLE in MODES 1, 2, and 3 when RCS pressure is ≥ 2000 psig, and a secondary side break or stuck open valve could result in the rapid depressurization of the steam line(s). This Function is not required to be OPERABLE in MODE 3 with RCS pressure < 2000 psig, 4, 5, or 6 because there is not sufficient energy in the secondary side of the unit to cause an accident.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

f, g. Safety Injection - High Steam Flow in Two Steam Lines Coincident With T_{avg} - Low or Coincident With Steam Line Pressure - Low

These Functions (1.f and 1.g) provide protection against the SLB accident.

Two steam line flow channels per steam line are required OPERABLE for these Functions. The steam line flow channels are combined in a one-out-of-two logic to indicate high steam flow in one steam line. The steam flow transmitters provide control inputs, but the control function cannot cause the events that the Function must protect against. Therefore, two channels are sufficient to satisfy redundancy requirements. The one-out-of-two configuration allows online testing because trip of one high steam flow channel is not sufficient to cause initiation. High steam flow in two steam lines is acceptable in the case of a single steam line fault due to the fact that the remaining intact steam lines will pick up the full turbine load. The increased steam flow in the remaining intact lines will actuate the required second high steam flow trip. Additional protection is provided by Function 1.e, High Differential Pressure Between Steam Header and Steam Lines.

One channel of T_{avg} per loop and one channel of low steam line pressure per steam line are required OPERABLE. For each parameter, the channels for all loops or steam lines are combined in a logic such that two channels tripped will cause a trip for the parameter. For example, the low steam line pressure channels are combined in two-out-of-three logic. Thus, the Function trips on one-out-of-two high flow in any two-out-of-three steam lines if there is a low T_{avg} trip in any two-out-of-three RCS loops, or if there is a low pressure trip in any two-out-of-three steam lines. Since the accident that this Function protects against cause both low steam line pressure and low T_{avg}, provision of one channel per loop or steam line ensures

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

f, g. <u>Safety Injection – High Steam Flow in Two Steam Lines Coincident With T_{avg} – Low or Coincident With Steam Line Pressure – Low</u> (continued)

no single random failure can disable both of these Functions. The steam line pressure and T_{avg} channels provide control inputs, but the control function cannot initiate events that the Function acts to mitigate.

This Function must be OPERABLE in MODE 1, and MODES 2 and 3 above T_{avg}-Low interlock setpoint when a secondary side break or stuck open valve could result in the rapid depressurization of the steam line(s). This signal may be manually blocked by the operator when below the low T_{avg} setpoint. Above 543°F, this Function is automatically unblocked. This Function is not required OPERABLE below 543°F, because the reactor is not critical. SLB may be addressed by Containment Pressure High (inside containment) or by High Steam Flow in Two Steam Lines coincident with Steam Line Pressure – Low, for Steam Line Isolation, followed by High Differential Pressure Between the Steam Header and One Steam Line, for SI. This Function is not required to be OPERABLE in MODE 3 (with T_{avg} < 543°F), 4, 5, or 6 because there is insufficient energy in the secondary side of the unit to cause an accident.

2. <u>Containment Spray</u>

Containment Spray provides three primary functions:

1. Lowers containment pressure and temperature after an HELB in containment;

2. Reduces the amount of radioactive iodine in the containment atmosphere; and

3. Adjusts the pH of the water in the containment recirculation sump after a large break LOCA.

These functions are necessary to:

(continued)

BASES

APPLICABLE SAFETY ANALYSIS, LCO, and APPLICABILITY (continued)

2. Containment Spray

- Ensure the pressure boundary integrity of the containment structure;
- Limit the release of radioactive iodine to the environment in the event of a failure of the containment structure; and
- Minimize corrosion of the components and systems inside containment following a LOCA.

The containment spray actuation signal starts the containment spray pumps and aligns the discharge of the pumps to the containment spray nozzle headers in the upper levels of containment. Water is initially drawn from the RWST by the containment spray pumps and mixed with a sodium hydroxide solution from the spray additive tank. When the RWST reaches the low low level setpoint, the spray pump suctions are shifted to the containment sump (through the RHR system) if continued containment spray is required. Containment spray is actuated automatically by Containment Pressure – High High.

a. Containment Spray – Manual Initiation

The operator can initiate containment spray at any time from the control room by simultaneously depressing two containment spray actuation pushbuttons. Because an inadvertent actuation of containment spray could have such serious consequences, two pushbuttons must be depressed simultaneously to initiate containment spray. Two Manual Initiation pushbuttons are required to be OPERABLE to ensure no single failure disables the Manual Initiation Function. Note that Manual Initiation of containment spray also actuates Phase B containment isolation and containment ventilation isolation.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

b. Containment Spray - Automatic Actuation Logic and Actuation Relays

Automatic actuation logic and actuation relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b.

Manual and automatic initiation of containment spray must be OPERABLE in MODES 1, 2, 3, and 4 when there is a potential for an accident to occur, and sufficient energy in the primary or secondary systems to pose a threat to containment integrity due to overpressure conditions. In MODES 5 and 6, there is insufficient energy in the primary and secondary systems to result in containment overpressure. In MODES 5 and 6, there is also adequate time for the operators to evaluate unit conditions and respond, to mitigate the consequences of abnormal conditions by manually starting individual components.

c. Containment Spray - Containment Pressure Hi-Hi

This signal provides protection against a LOCA or an SLB inside containment. The transmitters (d/p cells) are located outside of containment with the sensing line (high pressure side of the transmitter) located inside containment. The transmitters and electronics are located outside of containment. Thus, they will not experience any adverse environmental conditions and the Trip Setpoint reflects only steady state instrument uncertainties.

This is the only Function that requires the bistable output to energize to perform its required action. It is not desirable to have a loss of power actuate containment spray, since the consequences of an inadvertent actuation of containment spray could be serious. Therefore, two-out-of-three logic, on two sets of three (total of six channels), is used to generate the Containment Pressure - High High signal. Note that this Function has the requirement that no more than one channel is permitted to be

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

c. Containment Spray - Containment Pressure Hi - Hi (continued)

placed in trip to decrease the probability of an inadvertent actuation.

Containment Pressure - High High must be OPERABLE in MODES 1, 2, 3, and 4 when there is sufficient energy in the primary and secondary sides to pressurize the containment following a pipe break. In MODES 5, and 6, there is insufficient energy in the primary and secondary sides to pressurize the containment and reach the Containment Pressure - High High setpoints.

The Containment Pressure - High High Function also initiates a Main Steam Line Isolation signal, as described in Function 4.d.

3. Containment Isolation

Containment Isolation provides isolation of the containment atmosphere, and all process systems that penetrate containment, from the environment. This Function is necessary to prevent or limit the release of radioactivity to the environment in the event of a large break LOCA.

There are two separate Containment Isolation signals, Phase A and Phase B. Phase A isolation isolates all automatically isolable process lines, except component cooling water (CCW) and reactor coolant pump (RCP) seal water return, at a relatively low containment pressure indicative of primary or secondary system leaks. For these types of events, forced circulation cooling using the RCPs and SGs is the preferred (but not required) method of decay heat removal. Since CCW is required to support RCP operation, not isolating CCW on the low pressure Phase A signal enhances unit safety by allowing operators to use forced RCS circulation to cool the unit. Isolating CCW on the low pressure signal may force the use of feed and bleed cooling, which could prove more difficult to control.

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

3. Containment Isolation (continued)

Phase A containment isolation is actuated automatically by SI, or manually. All process lines penetrating containment, with the exception of CCW and RCP seal water return, are isolated. CCW is not isolated at this time to permit continued operation of the RCPs with cooling water flow to the thermal barrier heat exchangers or oil coolers. All process lines not equipped with remote operated isolation valves are manually closed, or otherwise isolated, prior to reaching MODE 4.

Manual Phase A Containment Isolation is accomplished by either of two switches in the control room. Either switch actuates both trains. Note that manual actuation of Phase A Containment Isolation also actuates Containment Ventilation Isolation.

The Phase B signal isolates CCW and RCP seal water return. This occurs at a relatively high containment pressure that is indicative of a large break LOCA or an SLB. For these events, forced circulation using the RCPs is no longer desirable. Both the CCW and RCP seal water return penetrations are classified as essential penetrations in the UFSAR Section 6.2.4 (Ref. 7). The RCP seal water return valves are isolated after the associated RCP is shut down.

Phase B containment isolation is actuated by Containment Pressure—High High, or manually, as previously discussed. For containment pressure to reach a value high enough to actuate Containment Pressure—High High, a large break LOCA or SLB must have occurred. RCP operation will no longer be required and CCW to the RCPs is, therefore, no longer necessary. The RCPs can be operated with seal injection flow alone and without CCW flow to the thermal barrier heat exchanger.

Manual Phase B Containment Isolation is accomplished by the same pushbuttons that actuate Containment Spray. When the two pushbuttons are depressed simultaneously, Phase B Containment Isolation, Containment Ventilation Isolation, and Containment Spray will be actuated in both trains.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

a. Containment Isolation - Phase A Isolation

(1) Phase A Isolation - Manual Initiation

Manual Phase A Containment Isolation is actuated by either of two switches in the control room. Either switch actuates both trains. Note that manual initiation of Phase A Containment Isolation also actuates Containment Ventilation Isolation.

(2) Phase A Isolation - Automatic Actuation Logic and Actuation Relays

Automatic Actuation Logic and Actuation Relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b.

Manual and automatic initiation of Phase A Containment Isolation must be OPERABLE in MODES 1, 2, 3, and 4, when there is a potential for an accident to occur. In MODES 5 and 6, there is insufficient energy in the primary or secondary systems to pressurize the containment to require Phase A Containment Isolation. There also is adequate time for the operator to evaluate unit conditions and manually actuate individual isolation valves in response to abnormal or accident conditions.

(3) Phase A Isolation - Safety Injection

Phase A Containment Isolation is also initiated by all Functions that initiate SI. The Phase A Containment Isolation requirements for these Functions are the same as the requirements for their SI function. Therefore, the requirements are not repeated in Table 3.3.2-1. Instead, Function 1, SI, is referenced for all initiating Functions and requirements.

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

b. Containment Isolation - Phase B Isolation

Phase B Containment Isolation is accomplished by Manual Initiation, Automatic Actuation Logic and Actuation Relays, and by Containment Pressure channels (the same channels that actuate Containment Spray, Function 2). The Containment Pressure trip of Phase B Containment Isolation is energized to trip in order to minimize the potential of spurious trips that may damage the RCPs.

(1) Phase B Isolation - Manual Initiation

(2) Phase B Isolation - Automatic Actuation Logic and Actuation Relays

Manual and automatic initiation of Phase B containment isolation must be OPERABLE in MODES 1, 2, 3, and 4, when there is a potential for an accident to occur. In MODES 5 and 6, there is insufficient energy in the primary or secondary systems to pressurize the containment to require Phase B containment isolation. There also is adequate time for the operator to evaluate unit conditions and manually actuate individual isolation valves in response to abnormal or accident conditions.

(3) Phase B Isolation - Containment Pressure

The basis for containment pressure MODE applicability is as discussed for ESFAS Function 2.c above.

4. Steam Line Isolation

Isolation of the main steam lines provides protection in the event of an SLB inside or outside containment. Rapid isolation of the steam lines will limit the steam break accident to the blowdown from one SG, at most. For an SLB upstream of the main steam isolation valves (MSIVs), inside or outside of containment, closure of the MSIVs limits the accident to the

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

4. Steam Line Isolation (continued)

blowdown from only the affected SG. For an SLB downstream of the MSIVs, closure of the MSIVs terminates the accident as soon as the steam lines depressurize.

a. Steam Line Isolation - Manual Initiation

Manual initiation of Steam Line Isolation can be accomplished from the control room. There are three pushbuttons in the control room, one for each steam line. Each pushbutton actuates both trains of Steam Line Isolation for its corresponding MSIV. The LCO requires one channel per line to be OPERABLE.

b. Steam Line Isolation - Automatic Actuation Logic and Actuation Relays

Automatic actuation logic and actuation relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b.

Manual and automatic initiation of steam line isolation must be OPERABLE in MODES 1, 2, and 3 when there is sufficient energy in the RCS and SGs to have an SLB or other accident. This could result in the release of significant quantities of energy and cause a cooldown of the primary system. The Steam Line Isolation Function is required in MODES 2 and 3 unless all MSIVs are closed. In MODES 4, 5, and 6, there is insufficient energy in the RCS and SGs to experience an SLB or other accident releasing significant quantities of energy.

c. Steam Line Isolation - Containment Pressure - High High

This Function actuates closure of the MSIVs in the event of a LOCA or an SLB inside containment to maintain at least one unfaulted SG as a heat sink for the reactor, and to limit the mass and energy release to containment. Actuation logic

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

c. Steam Line Isolation - Containment Pressure - High High (continued)

is discussed under "Containment Spray - Containment Pressure," Function 2.c.

Containment Pressure - High High must be OPERABLE in MODES 1, 2, and 3, when there is sufficient energy in the primary and secondary side to pressurize the containment following a pipe break. This would cause a significant increase in the containment pressure, thus allowing detection and closure of the MSIVs. The Steam Line Isolation Function remains OPERABLE in MODES 2 and 3 unless all MSIVs are closed. In MODES 4, 5, and 6, there is not enough energy in the primary and secondary sides to pressurize the containment to the Containment Pressure - High High setpoint.

d, e. Steam Line Isolation - High Steam Flow in Two Steam Lines Coincident with T_{avg} - Low or Coincident With Steam Line Pressure - Low

These Functions (4.d and 4.e) provide closure of the MSIVs during an SLB or inadvertent opening of an SG relief or a safety valve, to maintain at least one unfaulted SG as a heat sink for the reactor and to limit the mass and energy release to containment.

These Functions were discussed previously as Functions 1.f. and 1.g.

These Functions must be OPERABLE in MODES 1 and 2, and in MODE 3, when a secondary side break or stuck open valve could result in the rapid depressurization of the steam lines unless all MSIVs are closed. These Functions are not required to be OPERABLE in MODES 4, 5, and 6 because there is insufficient energy in the secondary side of the unit to have an accident.

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BASES

APPLICABLE SAFETY ANALYSIS, LCO, and APPLICABILITY (continued)

5. Feedwater Isolation

The primary function of the Feedwater Isolation signal is to stop the excessive flow of feedwater into the SGs. This Function is necessary to mitigate the effects of overfeeding the SGs, which could result in excessive cooldown of the primary system.

The Function is actuated on an SI signal and performs the following functions:

- Trips the MFW pumps; and
- Shuts the MFW isolation valves, MFW regulating valves and the bypass feedwater regulating valves.

This Function is actuated by an SI signal. The RPS initiates a turbine trip signal whenever a reactor trip is generated. In the event of SI, the unit and the turbine generator are tripped by the RPS. The MFW System is also taken out of operation and the AFW System is automatically started. The SI signal was discussed previously.

a. Feedwater Isolation - Automatic Actuation Logic and Actuation Relays

Automatic Actuation Logic and Actuation Relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b.

b. Feedwater Isolation - Safety Injection

Feedwater Isolation is also initiated by all Functions that initiate SI. The Feedwater Isolation Function requirements for these Functions are the same as the requirements for their SI function. Therefore, the requirements are not repeated in Table 3.3.2-1. Instead Function 1, SI, is referenced for all initiating functions and requirements.

Feedwater Isolation Functions must be OPERABLE in MODES 1, 2, 3 and 4 except when all MFIVs, MFRVs, and associated bypass valves are closed or isolated by a

(continued)

BASES

APPLICABLE SAFETY ANALYSIS, LCO, and APPLICABILITY

5. Feedwater Isolation (continued)

closed manual valve when the MFW System is in operation and the turbine generator may be in operation. In MODES 5 and 6, the MFW System and the turbine generator are not in service and this Function is not required to be OPERABLE.

6. Engineered Safety Feature Actuation System Interlocks

To allow some flexibility in unit operations, several interlocks are included as part of the ESFAS. These interlocks permit the operator to block some signals, automatically enable other signals, prevent some actions from occurring, and cause other actions to occur. The interlock Functions back up manual actions to ensure bypassable functions are in operation under the conditions assumed in the safety analyses.

a. Engineered Safety Feature Actuation System Interlocks - Pressurizer Pressure Low

This interlock permits a normal unit cooldown and depressurization without actuation of SI. With two-out-of-three pressurizer pressure channels (discussed previously) less than the interlock setpoint, the operator can manually block the Pressurizer Pressure - Low and the High Differential Pressure Between Steam Header and Steam Lines SI signal. When two-out-of-three pressurizer pressure channels exceed the interlock setpoint, these functions are automatically reinstated.

This Function must be OPERABLE in MODES 1, 2, and 3 to allow an orderly cooldown and depressurization of the unit without the actuation of SI or main steam isolation. This Function does not have to be OPERABLE in MODE 4, 5, or 6 because system pressure must already be below the interlock setpoint for the requirements of the heatup and cooldown curves to be met.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

b. Engineered Safety Feature Actuation System Interlocks – T_{avg} – Low

On increasing reactor coolant temperature, this interlock reinstates SI on High Steam Flow Coincident With Steam Line Pressure – Low or Coincident With T_{avg} – Low and provides an arming signal to the Steam Dump System. On decreasing reactor coolant temperature, the interlock allows the operator to manually block SI on High Steam Flow Coincident With Steam Line Pressure – Low or Coincident with T_{avg} – Low. On a decreasing temperature, the interlock also removes the arming signal to the Steam Dump System to prevent an excessive cooldown of the RCS due to a malfunctioning Steam Dump System.

Since T_{avg} is used as an indication of bulk RCS temperature, this Function meets redundancy requirements with one OPERABLE channel in each loop. These channels are used in two-out-of-three logic.

This Function must be OPERABLE in MODES 1, 2, and 3 when a secondary side break or stuck open valve could result in the rapid depressurization of the steam lines. This Function does not have to be OPERABLE in MODE 4, 5, or 6 because there is insufficient energy in the secondary side of the unit to have an accident.

The ESFAS instrumentation satisfies Criterion 3 of the NRC Policy Statement.

ACTIONS

Note 1 has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed on Table 3.3.2-1.

Due to the plant design, maintenance or testing of a single channel can not be performed without causing all channels of the associated Function to be inoperable. In many cases, maintenance or testing will also cause the associated train to be inoperable. Therefore, Note 2 has been added in the

(continued)

BASES

ACTIONS (continued)

ACTIONS to permit a single train to be inoperable for the purpose of maintenance for up to 12 hours provided the redundant train is OPERABLE. Note 2 to the Surveillance Requirements provides a 6 hour allowance for the performance of surveillance tests. If maintenance is required as a result of a failed surveillance test, Note 2 to LCO 3.3.2 ACTIONS is applicable and the delay period will begin upon completion of the surveillance test or expiration of the 6 hour testing allowance, whichever is less.

In the event a channel's Trip Setpoint is found nonconservative with respect to the Allowable Value, or the transmitter, instrument Loop, signal processing electronics, or bistable is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the LCO Condition(s) entered for the protection Function(s) affected. When the Required Channels in Table 3.3.2-1 are specified (e.g., on a per steam line, per loop, per SG, etc., basis), then the Condition may be entered separately for each steam line, loop, SG, etc., as appropriate.

When the number of inoperable channels in a trip function exceed those specified in one or other related Conditions associated with a trip function, then the unit is outside the safety analysis. Therefore, LCO 3.0.3 should be immediately entered if applicable in the current MODE of operation.

<u>A.1</u>

Condition A applies to all ESFAS protection functions.

Condition A addresses the situation where one or more channels or trains for one or more Functions are inoperable at the same time. The Required Action is to refer to Table 3.3.2-1 and to take the Required Actions for the protection functions affected. The Completion Times are those from the referenced Conditions and Required Actions.

<u>B.1, B.2.1 and B.2.2</u>

Condition B applies to manual initiation of:

- SI; and

(continued)

BASES

ACTIONS

B.1, B.2.1 and B.2.2 (continued)

- Phase A Isolation.

This action addresses the train orientation of the relay logic for the functions listed above. If a channel or train is inoperable, 48 hours is allowed to return it to an OPERABLE status. The specified Completion Time is reasonable considering that there are two automatic actuation trains and another manual initiation train OPERABLE for each Function, and the low probability of an event occurring during this interval. If the train cannot be restored to OPERABLE status, the unit must be placed in a MODE in which the LCO does not apply. This is done by placing the unit in at least MODE 3 within an additional 6 hours (54 hours total time) and in MODE 5 within an additional 30 hours (84 hours total time). The allowable Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

C.1, C.2.1 and C.2.2

Condition C applies to the automatic actuation logic and actuation relays for the following functions:

- SI; and
- Containment Spray.

This action addresses the train orientation of the relay logic and the master and slave relays. If one train is inoperable, 6 hours are allowed to restore the train to OPERABLE status. The specified Completion Time is reasonable considering that there is another train OPERABLE, and the low probability of an event occurring during this interval. If the train cannot be restored to OPERABLE status, the unit must be placed in a MODE in which the LCO does not apply. This is done by placing the unit in at least MODE 3 within an additional 6 hours (12 hours total time) and in MODE 5 within an additional 30 hours (42 hours total time). The Completion Times are reasonable, based on operating experience, to reach the required unit conditions

(continued)

BASES

ACTIONS

C.1, C.2.1, and C.2.2 (continued)

from full power conditions in an orderly manner and without challenging unit systems.

D.1, D.2.1, and D.2.2

Condition D applies to:

- Pressurizer Pressure - Low;
- Steam Line Differential Pressure - High; and
- High Steam Flow in Two Steam Lines Coincident With T_{avg} - Low or Coincident With Steam Line Pressure - Low;

If one channel is inoperable, 6 hours are allowed to restore the channel to OPERABLE status or to place it in the tripped condition. Generally this Condition applies to functions that operate on two-out-of-three logic. Therefore, failure of one channel places the Function in a two-out-of-two configuration. One channel must be tripped to place the Function in a one-out-of-two configuration that satisfies redundancy requirements.

Failure to restore the inoperable channel to OPERABLE status or place it in the tripped condition within 6 hours requires the unit be placed in MODE 3 within the following 6 hours and MODE 4 within the next 6 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 4, these Functions are no longer required OPERABLE.

E.1, E.2.1, and E.2.2

Condition E applies to:

- Safety Injection Containment Pressure - High; and
- Containment Spray Containment Pressure - High High.

(continued)

BASES

ACTIONS

E.1, E.2.1, and E.2.2 (continued)

None of these signals has input to a control function. Thus, two-out-of-three logic is necessary to meet acceptable protective requirements. However, a two-out-of-three design would require tripping a failed channel. This is undesirable because a single failure would then cause spurious containment spray initiation. Spurious spray actuation is undesirable because of the cleanup problems presented. Therefore, these channels are designed with two-out-of-three on two sets of three logic. One failed channel per set may be placed in trip and still maintain adequate margin to spurious spray actuation.

To avoid the inadvertent actuation of containment spray and Phase B containment isolation, no more than one channel may be placed in trip. Restoring the channel to OPERABLE status, or placing the inoperable channel in trip within 6 hours, is sufficient to assure that the Function remains OPERABLE and minimizes the time that the Function may be in a partial trip condition (assuming the inoperable channel has failed high). The Completion Time is further justified based on the low probability of an event occurring during this interval. Failure to restore the inoperable channel to OPERABLE status, or place it in trip within 6 hours, requires the unit be placed in MODE 3 within the following 6 hours, MODE 4 within the next 6 hours, and MODE 5 within the next 24 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 5, these Functions are no longer required OPERABLE.

F.1, F.2.1, and F.2.2

Condition F applies to:

- Manual Initiation of Steam Line Isolation.

For the Manual Initiation Function, this action addresses the train orientation of the relay logic. If a train or channel is inoperable, 48 hours are allowed to return it to OPERABLE status. The specified Completion Time is reasonable considering the nature of this Function, the available redundancy, and the low probability of an event

(continued)

BASES

ACTIONS

F.1, F.2.1, and F.2.2 (continued)

occurring during this interval. If the Function cannot be returned to OPERABLE status, the unit must be placed in MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power in an orderly manner and without challenging unit systems. In MODE 4, the unit does not have any analyzed transients or conditions that require the explicit use of the protection functions noted above.

G.1, G.2.1 and G.2.2

Condition G applies to the automatic actuation logic and actuation relays for the Steam Line Isolation.

The action addresses the train orientation of the relay logic and the master and slave relays for these functions. If one train is inoperable, 6 hours are allowed to restore the train to OPERABLE status. The Completion Time for restoring a train to OPERABLE status is reasonable considering that there is another train OPERABLE, and the low probability of an event occurring during this interval. If the train cannot be returned to OPERABLE status, the unit must be brought to MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. Placing the unit in MODE 4 removes all requirements for OPERABILITY of the protection channels and actuation functions. In this MODE, the unit does not have analyzed transients or conditions that require the explicit use of the protection functions noted above.

H.1, H.2.1 and H.2.2

Condition H applies to the Pressurizer Pressure-Low and T_{avg}-Low interlocks.

With one channel inoperable, the operator must verify that the interlock is in the required state for the existing unit

(continued)

BASES

ACTIONS

H.1, H.2.1 and H.2.2 (continued)

condition. This action manually accomplishes the function of the interlock.

Determination must be made within 1 hour. The 1 hour Completion Time is equal to the time allowed by LCO 3.0.3 to initiate shutdown actions in the event of a complete loss of ESFAS function. If the interlock is not in the required state (or placed in the required state) for the existing unit condition, the unit must be placed in MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. Placing the unit in MODE 4 removes all requirements for OPERABILITY of these interlocks.

I.1, I.2.1, I.2.2, and I.2.3

Condition I applies to manual initiation of Containment Spray.

This action addresses the train orientation of the relay logic for the function. With one or more of the Containment Spray Manual Initiation pushbuttons inoperable, there is no means available to manually initiate Containment Spray or Phase B Containment Isolation through the automatic actuation relays. The Manual Initiation is set up on two-out-of-two logic, with only two pushbuttons provided, and a single failure of either of the pushbuttons renders the entire Manual Initiation function inoperable. Therefore, if a channel or train is inoperable, it must be returned to OPERABLE status within 1 hour. The 1 hour Completion Time is equal to the time allowed by LCO 3.0.3 to initiate shutdown actions in the event of a complete loss of ESFAS function. If the channel is not returned to OPERABLE status within the 1 hour Completion Time, the unit must be placed in MODE 3 within the next 6 hours, in MODE 4 within the following 6 hours, and in MODE 5 within the following 24 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. Placing the unit in

(continued)

BASES

ACTIONS

I.1, I.2.1, I.2.2 and I.2.3 (continued)

MODE 5 removes all requirements for OPERABILITY of this function.

SURVEILLANCE REQUIREMENTS

The SRs for each ESFAS Function are identified by the column of Table 3.3.2-1.

A Note (Note 1) has been added to the SR Table to clarify that Table 3.3.2-1 determines which SRs apply to which ESFAS Functions.

Note that each channel of process protection supplies both trains of the ESFAS. When testing channel I, train A and train B must be examined. Similarly, train A and train B must be examined when testing channel II, channel III, and channel IV (if applicable). The CHANNEL CALIBRATION and COTs are performed in a manner that is consistent with the assumptions used in analytically calculating the required channel accuracies.

The Surveillances are also modified by Note 2 to indicate that when a channel is placed in an inoperable status solely for the performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the redundant ESFAS train is OPERABLE. Upon completion of the Surveillance or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and the Required Actions performed. If maintenance is to be subsequently performed as a result of a failed surveillance test, Note 2 to LCO 3.3.2 ACTIONS is applicable and the delay period will begin upon completion of the surveillance test or expiration of the 6 hour testing allowance, whichever is less. Note 2 to the Surveillance Requirements is based on operating history which has shown that 6 hours is generally the time required to perform the channel surveillance with additional time to allow for short term plant changes or verification of any abnormal responses. This 6 hour testing allowance does not significantly reduce the probability that the ESFAS will initiate when necessary.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and reliability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.2.2

SR 3.3.2.2 is the performance of an ACTUATION LOGIC TEST. The ESF relay logic is tested every 31 days on a STAGGERED TEST BASIS. The train being tested is placed in the test condition. All possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is tested for continuity. This verifies that the logic modules are OPERABLE and that there is an intact voltage signal path to the master relay coils. The Frequency of every 31 days on a STAGGERED TEST BASIS is adequate. It is based on industry operating experience, considering instrument reliability and operating history data.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.2.3

SR 3.3.2.3 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay. The master relay is actuated by either a manual or automatic initiation of the function being tested. Contact operation is verified either by a continuity check of the circuit containing the master relay or proper operation of the end device during the supported equipment simulated or actual automatic actuation test. This test is performed every 18 months. The 18 month Frequency is adequate, based on industry operating experience, and is consistent with the typical refueling cycle, which provides the plant conditions necessary for testing.

SR 3.3.2.4

SR 3.3.2.4 is the performance of a COT.

A COT is performed on each required channel to ensure the entire channel, with the exception of the transmitter sensing device, will perform the intended Function. Setpoints must be found within the Allowable Values specified in Table 3.3.2-1.

The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology. The setpoint shall be left set consistent with the assumptions of the current unit specific setpoint methodology.

The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis in WCAP-10271-P-A (Ref. 8) when applicable.

The Frequency of 92 days is justified in Reference 8.

SR 3.3.2.5

SR 3.3.2.5 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified either by a continuity check

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.5 (continued)

of the circuit containing the slave relay, or by verification of proper operation of the end device during supported equipment simulated or actual automatic actuation test. This test is performed every 18 months. The 18 month Frequency is adequate, based on industry operating experience, and is consistent with the typical refueling cycle, which provides the plant conditions necessary for testing.

SR 3.3.2.6

SR 3.3.2.6 is the performance of a TADOT. This test is a check of Manual Actuation Functions. It is performed every 18 months. Each Manual Actuation Function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.). The Frequency is adequate, based on industry operating experience and is consistent with the typical refueling cycle. The SR is modified by a Note that excludes verification of setpoints during the TADOT for manual initiation Functions. The manual initiation Functions have no associated setpoints.

SR 3.3.2.7

SR 3.3.2.7 is the performance of a CHANNEL CALIBRATION.

A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter within the necessary range and accuracy.

CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint methodology. The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology.

The Frequency of 18 months is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint methodology.

(continued)

BASES (continued)

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 7.
3. UFSAR, Chapter 15.
4. UFSAR, Section 3.1.
5. IEEE-279-1968.
6. 10 CFR 50.49.
7. UFSAR, Section 6.2.4.
8. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.

B 3.3 INSTRUMENTATION

B 3.3.3 Post Accident Monitoring (PAM) Instrumentation

BASES

BACKGROUND

The primary purpose of the PAM instrumentation is to display unit variables that provide information required by the control room operators during accident situations. This information provides the necessary support for the operator to take the manual actions for which no automatic control is provided and that are required for safety systems to accomplish their safety functions for Design Basis Accidents (DBAs).

The OPERABILITY of the accident monitoring instrumentation ensures that there is sufficient information available on selected unit parameters to monitor and to assess unit status and behavior following an accident.

The availability of accident monitoring instrumentation is important so that responses to corrective actions can be observed and the need for, and magnitude of, further actions can be determined. These essential instruments are identified by unit specific documents (Ref. 1) addressing the recommendations of Regulatory Guide 1.97 (Ref. 2) as required by Supplement 1 to NUREG-0737 (Ref. 3).

The instrument channels required to be OPERABLE by this LCO include two classes of parameters identified during unit specific implementation of Regulatory Guide 1.97 as Type A and Category I variables.

Type A variables are included in this LCO because they provide the primary information required for the control room operator to take specific manually controlled actions for which no automatic control is provided, and that are required for safety systems to accomplish their safety functions for DBAs.

Category I variables are the key variables deemed risk significant because they are needed to:

(continued)

BASES

BACKGROUND (continued)

- Determine whether other systems important to safety are performing their intended functions;
- Provide information to the operators that will enable them to determine the likelihood of a gross breach of the barriers to radioactivity release; and
- Provide information regarding the release of radioactive materials to allow for early indication of the need to initiate action necessary to protect the public, and to estimate the magnitude of any impending threat.

These key variables are identified by the HBRSEP Regulatory Guide 1.97 analyses (Ref. 1). These analyses identify the unit specific Type A and Category I variables and provide justification for deviating from the NRC proposed list of Category I variables.

This LCO also includes certain parameters associated with risk-significant scenarios or mitigating systems as modeled in the HBRSEP Probabilistic Safety Assessment (PSA). These instruments include Auxiliary Feedwater Flow, PORV Position (primary indication), PORV Block Valve Position (primary indication), and Pressurizer Safety Valve Position (primary indication).

The specific instrument Functions listed in Table 3.3.3-1 are discussed in the LCO section.

APPLICABLE SAFETY ANALYSES

The PAM instrumentation ensures the operability of Regulatory Guide 1.97 Type A and Category I variables so that the control room operating staff can:

- Perform the diagnosis specified in the emergency operating procedures (these variables are restricted to preplanned actions for the primary success path of DBAs), e.g., loss of coolant accident (LOCA);
- Take the specified, pre-planned, manually controlled actions, for which no automatic control is provided, and that are required for safety systems to accomplish their safety function;

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

- Determine whether systems important to safety are performing their intended functions;
- Determine the likelihood of a gross breach of the barriers to radioactivity release;
- Determine if a gross breach of a barrier has occurred; and
- Initiate action necessary to protect the public and to estimate the magnitude of any impending threat.

PAM instrumentation that meets the definition of Type A in Regulatory Guide 1.97 satisfies Criterion 3 of the NRC Policy Statement. Category I, non-Type A, instrumentation must be retained in TS because it is intended to assist operators in minimizing the consequences of accidents. Therefore, Category I, non-Type A, variables are important for reducing public risk.

LCO

The PAM instrumentation LCO provides OPERABILITY requirements for Regulatory Guide 1.97 Type A monitors, which provide information required by the control room operators to perform certain manual actions specified in the unit Emergency Operating Procedures. These manual actions ensure that a system can accomplish its safety function, and are credited in the safety analyses. Additionally, this LCO addresses Regulatory Guide 1.97 instruments that have been designated Category I, non-Type A.

The OPERABILITY of the PAM instrumentation ensures there is sufficient information available on selected unit parameters to monitor and assess unit status following an accident. This capability is consistent with the recommendations of Reference 1.

LCO 3.3.3 requires two OPERABLE channels for most Functions. Two OPERABLE channels ensure no single failure prevents operators from getting the information necessary for them to determine the safety status of the unit, and to bring the unit to and maintain it in a safe condition following an accident.

(continued)

BASES

LCO (continued)

Furthermore, OPERABILITY of two channels allows a CHANNEL CHECK during the post accident phase to confirm the validity of displayed information.

The exception to the two channel requirement is Containment Isolation Valve (CIV) Position. In this case, the important information is the status of the containment penetrations. The LCO requires one position indicator for each active CIV. This is sufficient to redundantly verify the isolation status of each isolable penetration either via indicated status of the active valve and prior knowledge of a passive valve, or via system boundary status. If a normally active CIV is known to be closed and deactivated, position indication is not needed to determine status. Therefore, the position indication for valves in this state is not required to be OPERABLE.

Type A and Category I variables are required to meet Regulatory Guide 1.97 Category I (Ref. 2) design and qualification requirements for seismic and environmental qualification, single failure criterion, utilization of emergency standby power, immediately accessible display, continuous readout, and recording of display.

Listed below are discussions of the specified instrument Functions listed in Table 3.3.3-1.

1, 2. Power Range and Source Range Neutron Flux

Power Range and Source Range Neutron Flux indication is provided to verify reactor shutdown. The two ranges are necessary to cover the full range of flux that may occur post accident.

Neutron flux is used for accident diagnosis, verification of subcriticality, and diagnosis of positive reactivity insertion.

3, 4. Reactor Coolant System (RCS) Hot and Cold Leg Temperatures

RCS Hot and Cold Leg Temperatures are Category I variables provided for verification of core cooling and long term surveillance.

(continued)

BASES

LCO

3, 4. Reactor Coolant System (RCS) Hot and Cold Leg Temperatures (continued)

RCS hot and cold leg temperatures are used to determine RCS subcooling margin. RCS subcooling margin will allow termination of safety injection (SI), if still in progress, or reinitiation of SI if it has been stopped. RCS subcooling margin is also used for unit stabilization and cooldown control.

In addition, RCS cold leg temperature is used in conjunction with RCS hot leg temperature to verify the unit conditions necessary to establish natural circulation in the RCS.

5. Reactor Coolant System Pressure (Wide Range)

RCS wide range pressure from the Inadequate Core Cooling Monitor is a Category I variable provided for verification of core cooling and RCS integrity long term surveillance.

RCS pressure is used to verify delivery of SI flow to RCS from at least one train when the RCS pressure is below the pump shutoff head. RCS pressure is also used to verify closure of manually closed spray line valves and pressurizer power operated relief valves (PORVs).

In addition to these verifications, RCS pressure is used for determining RCS subcooling margin. RCS subcooling margin will allow termination of SI, if still in progress, or reinitiation of SI if it has been stopped. RCS pressure can also be used:

- to determine whether to terminate actuated SI or to reinitiate stopped SI;
- to determine when to reset SI and shut off low head SI;
- to manually restart low head SI;
- as reactor coolant pump (RCP) trip criteria; and

(continued)

BASES

LCO

5. Reactor Coolant System Pressure (Wide Range) (continued)

- to make a determination on the nature of the accident in progress and where to go next in the procedure.

RCS subcooling margin is also used for unit stabilization and cooldown control.

RCS pressure is also related to three decisions about depressurization. They are:

- to determine whether to proceed with primary system depressurization;
- to verify termination of depressurization; and
- to determine whether to close accumulator isolation valves during a controlled cooldown/depressurization.

A final use of RCS pressure is to determine whether to operate the pressurizer heaters.

RCS wide range pressure from the Inadequate Core Cooling Monitor is a Type A variable because the operator uses this indication to monitor the cooldown of the RCS following a steam generator tube rupture (SGTR) or small break LOCA. Operator actions to maintain a controlled cooldown, such as adjusting steam generator (SG) pressure or level, would use this indication. Furthermore, RCS pressure is one factor that may be used in decisions to terminate RCP operation.

6. Refueling Water Storage Tank Level

Refueling Water Storage Tank Level is provided as an indication of the availability of an adequate suction head for the RHR System following a loss of coolant accident (LOCA). This indication also provides the operator with information needed to determine when to manually initiate long term recirculation in the RCS. When the RWST level is compared with containment sump

(continued)

BASES

LCO

6. Refueling Water Storage Tank Level (continued)

level, RCS leakage outside containment can be assessed.

7. Containment Sump Water Level (Wide Range)

Containment Sump Water Level is provided for verification and long term surveillance of RCS integrity.

Containment Sump Water Level is used to determine:

- containment sump level accident diagnosis; and
- when to begin the recirculation procedure.

8. Containment Pressure (Wide Range)

Containment Pressure (Wide Range) is provided for verification of RCS and containment OPERABILITY.

Containment pressure is used to provide indication of whether the overall containment cooling function provided by containment spray and fan coolers is being achieved. Containment pressure is also used to verify the Containment Pressure-High SI signal and the Containment Pressure-High High Spray and Steam Line Isolation Signals.

9. Containment Isolation Valve Position

CIV Position is provided for verification of Containment OPERABILITY, and Phase A and Phase B isolation.

When used to verify Phase A and Phase B isolation, the important information is the isolation status of the containment penetrations. The LCO requires one channel of valve position indication to be OPERABLE for each active CIV in a containment penetration flow path, i.e., two total channels of CIV position indication for a penetration flow path with two active valves. For containment penetrations with only one

(continued)

BASES

LCO

9. Containment Isolation Valve Position (continued)

active CIV, Note (b) requires a single channel of valve position indication to be OPERABLE. This is sufficient to redundantly verify the isolation status of each isolable penetration either via indicated status of the active valve, as applicable, and prior knowledge of a passive valve, or via system boundary status. If a normally active CIV is known to be closed and deactivated, position indication is not needed to determine status. Therefore, the position indication for valves in this state is not required to be OPERABLE. Note (a) to the Required Channels states that the Function is not required for isolation valves whose associated penetration is isolated by at least one closed and deactivated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.

10. Containment Area Radiation (High Range)

Containment Area Radiation is provided to monitor for the potential of significant radiation releases and to provide release assessment for use by operators in determining the need to invoke site emergency plans. Containment radiation level is used to determine the type of high energy line break (HELB) that has occurred inside containment.

11. Hydrogen Monitors

Hydrogen Monitors are provided to detect high hydrogen concentration conditions that represent a potential for containment breach from a hydrogen explosion. This variable is also important in verifying the adequacy of mitigating actions.

12. Pressurizer Level

Pressurizer Level is used to determine whether to terminate SI, if still in progress, or to reinitiate SI if it has been stopped. Knowledge of pressurizer

(continued)

BASES

LCO

12. Pressurizer Level (continued)

water level is also used to verify the unit conditions necessary to establish natural circulation in the RCS and to verify that the unit is maintained in a safe shutdown condition.

13. Steam Generator Water Level (Narrow Range)

SG Water Level is provided to monitor operation of decay heat removal via the SGs. Redundant monitoring capability is provided by two channels per SG. The level signal is input to the unit computer, a control room indicator, SG water level control, and the RPS.

SG Water Level is used to:

- identify the faulted SG following a tube rupture;
- verify that the intact SGs are an adequate heat sink for the reactor; and
- determine the nature of the accident in progress (e.g., verify an SGTR).

14. Condensate Storage Tank (CST) Level

CST Level is provided to ensure water supply for auxiliary feedwater (AFW). CST Level is displayed in the control room.

CST Level is considered a Type A variable because the control room meter is considered the primary indication used by the operator.

The DBAs that require AFW are the loss of electric power, steam line break (SLB), and small break LOCA.

The CST is the initial source of water for the AFW System. However, as the CST is depleted, manual operator action is necessary to replenish the CST or align suction to the AFW pumps from the Service Water System.

(continued)

BASES

LCO (continued)

15, 16, 17, 18. Core Exit Temperature

Core Exit Temperature is provided for verification and long term surveillance of core cooling.

Adequate core cooling is ensured with two valid Core Exit Temperature channels per quadrant with one core exit thermocouple per required channel (Ref. 4). Core Exit Temperature is used to determine whether to terminate SI, if still in progress, or to reinitiate SI if it has been stopped. Core Exit Temperature is also used for unit stabilization and cooldown control.

Two OPERABLE channels of Core Exit Temperature are required in each quadrant to provide indication of radial distribution of the coolant temperature rise across representative regions of the core. Power distribution symmetry was considered in determining the specific number and locations provided for diagnosis of local core problems. Two channels of Core Exit Temperature per quadrant ensures that a single failure will not disable the ability to determine the core exit temperature in any quadrant.

19. Auxiliary Feedwater Flow

AFW Flow is provided to monitor operation of decay heat removal via the SGs.

The three AFW discharge lines from the motor driven AFW pumps and the three AFW discharge lines from the steam driven AFW pump each contain one primary flow indicator. This provides two AFW flow paths per SG, for a total of six AFW lines and flow indicators. Since the primary indication used by the operator during an accident is the control room indicator, the PAM specification deals specifically with this portion of the instrument channel.

AFW flow is used three ways:

- to verify delivery of AFW flow to the SGs;
- to determine adequacy of the secondary heat sink; and

(continued)

BASES

LCO

19. Auxiliary Feedwater Flow (continued)

- to regulate AFW flow so that the SG tubes remain covered.

AFW flow is also used by the operator to verify that the AFW System is delivering the correct flow to each SG. However, the primary indication used by the operator to ensure an adequate inventory is SG level.

20. Steam Generator Pressure

Steam generator pressure is used to diagnose a faulted SG. SG pressure also provides information required to mitigate an SGTR event, verify natural circulation and to maintain the unit in a safe shutdown condition.

21. Containment Spray Additive Tank Level

Containment spray additive tank level is used to monitor the volume of sodium hydroxide addition to the containment spray for elemental iodine removal from the containment atmosphere following a LOCA. The contents of the spray additive tank (sodium hydroxide solution) are mixed into the spray stream to provide adequate iodine removal from the containment atmosphere by a washing action.

Direct Indication of Relief and Safety Valve Position

The consequence of a failure of relief and safety valves to close is a loss of coolant and depressurization of the RCS. A positive indication of the position of these valves can aid the operator in diagnosing a failure and in taking appropriate corrective action. Thus, the consequences of a failure of these valves can be reduced if the operator can reliably determine that a valve has failed to close.

22. PORV Position (Primary)

Each PORV is equipped with two stem mounted limit switches, which are seismically qualified and powered

(continued)

BASES

LCO

22. PORV Position (Primary) (continued)

from an emergency power source, to provide the direct (primary) means of valve position indication, from fully closed to fully open.

23. PORV Block Valve Position (Primary)

Each PORV block valve is equipped with a Limitorque operator and position indication which is seismically qualified and powered from an emergency power source, to provide the direct (primary) means of valve position indication.

24. Safety Valve Position (Primary)

Each pressurizer safety valve is equipped with a single acoustical position indication system, which is seismically qualified and powered from an emergency power source, to provide the direct (primary) means of valve position indication. This system alarms in the control room to indicate an open safety valve.

APPLICABILITY

The PAM instrumentation LCO is applicable in MODES 1, 2, and 3. These variables are related to the diagnosis and pre-planned actions required to mitigate DBAs. The applicable DBAs are assumed to occur in MODES 1, 2, and 3. In MODES 4, 5, and 6, unit conditions are such that the likelihood of an event that would require PAM instrumentation is low; therefore, the PAM instrumentation is not required to be OPERABLE in these MODES.

ACTIONS

Note 1 has been added in the ACTIONS to exclude the MODE change restriction of LCO 3.0.4. This exception allows entry into the applicable MODE while relying on the ACTIONS even though the ACTIONS may eventually require unit shutdown. This exception is acceptable due to the passive function of the instruments, the operator's ability to respond to an accident using alternate instruments and methods, and the low probability of an event requiring these instruments.

(continued)

BASES

ACTIONS (continued)

Note 2 has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed on Table 3.3.3-1. The Completion Time(s) of the inoperable channel(s) of a Function are tracked separately for each Function starting from the time the Condition was entered for that Function.

A.1

Condition A applies when one or more Functions have one required channel that is inoperable. Required Action A.1 requires restoring the inoperable channel to OPERABLE status within 30 days. The 30 day Completion Time is based on operating experience and takes into account the remaining OPERABLE channel (or in the case of a Function that has only one required channel, other non-Regulatory Guide 1.97 instrument channels to monitor the Function), the passive nature of the instrument (no critical automatic action is assumed to occur from these instruments), and the low probability of an event requiring PAM instrumentation during this interval. Condition A is modified by a Note that excludes certain PAM Functions since each of these Functions has only one channel. Condition D provides appropriate Required Actions for PAM Functions that have only one channel with that channel inoperable.

B.1

Condition B applies when the Required Action and associated Completion Time for Condition A are not met. This Required Action specifies initiation of actions in Specification 5.6.6, which requires a written report to be submitted to the NRC immediately. This report discusses the results of the root cause evaluation of the inoperability and identifies proposed restorative actions. This action is appropriate in lieu of a shutdown requirement since alternative actions are identified before loss of functional capability, and given the likelihood of unit conditions that would require information provided by this instrumentation.

(continued)

BASES

ACTIONS (continued)

C.1

Condition C applies when one or more Functions have two inoperable required channels (i.e., two channels inoperable in the same Function). Required Action C.1 requires restoring one channel in the Function(s) to OPERABLE status within 7 days. The Completion Time of 7 days is based on the relatively low probability of an event requiring PAM instrument operation and the availability of alternate means to obtain the required information. Continuous operation with two required channels inoperable in a Function is not acceptable because the alternate indications may not fully meet all performance qualification requirements applied to the PAM instrumentation. Therefore, requiring restoration of one inoperable channel of the Function limits the risk that the PAM Function will be in a degraded condition should an accident occur. Condition C is modified by a Note that excludes hydrogen monitor channels.

D.1

Condition D applies when one or more Functions, which have single, non-redundant position indication channels, have one required channel inoperable. Required Action D.1 requires that channel be restored to OPERABLE status within 7 days. The Completion Time of 7 days is based on the relatively low probability of an event requiring PAM instrument operation and the availability of alternate means to obtain the required information. Continuous operation with the required position indication channel inoperable is not acceptable because the alternate indications may not fully meet all performance qualification requirements applied to the PAM instrumentation. Therefore, requiring restoration of the inoperable channel limits the risk that the PAM Function will be in a degraded condition should an accident occur. Condition D is modified by a Note that excludes PAM Functions that have two or more required channels. Condition A provides appropriate Required Actions for PAM Functions that have two or more channels with one channel inoperable.

(continued)

BASES

ACTIONS (continued)

E.1

Condition E applies when two hydrogen monitor channels are inoperable. Required Action E.1 requires restoring one hydrogen monitor channel to OPERABLE status within 72 hours. The 72 hour Completion Time is reasonable based on the backup capability of the Post Accident Sampling System to monitor the hydrogen concentration for evaluation of core damage and to provide information for operator decisions. Also, it is unlikely that a LOCA (which would cause core damage) would occur during this time.

F.1

Condition F applies when the Required Action and associated Completion Time of Condition C, D or E are not met. Required Action F.1 requires entering the appropriate Condition referenced in Table 3.3.3-1 for the channel immediately. The applicable Condition referenced in the Table is Function dependent. Each time an inoperable channel has not met any Required Action of Condition C, D or E, and the associated Completion Time has expired, Condition F is entered for that channel and provides for transfer to the appropriate subsequent Condition.

G.1 and G.2

If the Required Action and associated Completion Time of Conditions C, D, or E are not met and Table 3.3.3-1 directs entry into Condition G, the unit must be brought to a MODE where the requirements of this LCO do not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and MODE 4 within 12 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

(continued)

BASES

ACTIONS (continued)

H.1

Condition H applies to the Containment Sump Water Level, Containment Pressure, Containment Area Radiation, Auxiliary Feedwater Flow, PORV Position, PORV Block Valve Position, and Safety Valve Position Functions, which have alternate monitoring means available for use. These alternate means may be temporarily installed if the normal PAM channel cannot be restored to OPERABLE status within the allotted time. If these alternate means are used, the Required Action is not to shut down the unit but rather to follow the directions of Specification 5.6.6, in the Administrative Controls section of the TS. The report provided to the NRC should discuss the alternate means used, describe the degree to which the alternate means are equivalent to the installed PAM channels, justify the areas in which they are not equivalent, and provide a schedule for restoring the normal PAM channels.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that SR 3.3.3.1 applies to each PAM instrumentation Function in Table 3.3.3-1 and SR 3.3.3.2 applies to each PAM instrumentation Function in Table 3.3.3-1, except Function 9, Containment Isolation Valve Position; SR 3.3.3.3 applies only to Function 9.

SR 3.3.3.1

Performance of the CHANNEL CHECK once every 31 days ensures that a gross instrumentation failure has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION. The high radiation instrumentation should be compared to similar unit instruments located throughout the unit.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.3.1 (continued)

Channel deviation criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE.

As specified in the SR, a CHANNEL CHECK is only required for those channels that are normally energized.

The Frequency of 31 days is based on operating experience that demonstrates that channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.3.2

A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter with the necessary range and accuracy. This SR is modified by a Note that excludes neutron detectors. The calibration method for neutron detectors is specified in the Bases of LCO 3.3.1, "Reactor Protection System (RPS) Instrumentation." The Frequency is based on operating experience and consistency with the typical industry refueling cycle.

SR 3.3.3.3

SR 3.3.3.3 is the performance of a TADOT of containment isolation valve position indication. This TADOT is performed every 18 months. The test shall independently verify the OPERABILITY of containment isolation valve position indication against the actual position of the valves.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.3.3 (continued)

The Frequency is based upon the known reliability of the Function and has been shown to be acceptable through operating experience.

The SR is modified by a Note that excludes verification of setpoints from the TADOT. The affected Function has no setpoints.

REFERENCES

1. NRC Safety Evaluation Report, H. B. Robinson Steam Electric Plant Unit No. 2, Docket No. 50-261, Conformance to Regulatory Guide 1.97, transmitted to CP&L by letter dated March 5, 1987.

2. Regulatory Guide 1.97, Revision 3, May 1983.

3. NUREG-0737, Supplement 1, "TMI Action Items."

4. CP&L Letter to NRC, "Inadequate Core Cooling Instrumentation, Generic Letter 82-28, NUREG-0737, Item II.F.2, Implementation Letter/License Amendment Request," dated September 16, 1987.

B 3.3 INSTRUMENTATION

B 3.3.4 Remote Shutdown System

BASES

BACKGROUND

The Remote Shutdown System provides the control room operator with sufficient instrumentation and controls to place and maintain the unit in a safe shutdown condition from a location other than the control room. This capability is necessary to protect against the possibility that the control room becomes inaccessible. A safe shutdown condition is defined as MODE 3. With the unit in MODE 3, the Auxiliary Feedwater (AFW) System and the steam generator (SG) safety valves can be used to remove core decay heat and meet all safety requirements. The long term supply of water for the AFW System and the ability to borate the Reactor Coolant System (RCS) from outside the control room allows extended operation in MODE 3.

If the control room becomes inaccessible, the operators can establish local control, and place and maintain the unit in MODE 3. Controls and necessary transfer switches are located locally at the switchgear, motor control panels, or other local stations. The unit automatically reaches MODE 3 following a unit shutdown and can be maintained safely in MODE 3 for an extended period of time.

The OPERABILITY of the remote shutdown control and instrumentation functions ensures there is sufficient information available on selected unit parameters to place and maintain the unit in MODE 3 should the control room become inaccessible.

APPLICABLE SAFETY ANALYSES

The Remote Shutdown System is required to provide equipment at appropriate locations outside the control room with a capability to promptly shut down and maintain the unit in a safe condition in MODE 3.

The Remote Shutdown System instrumentation is described in UFSAR Section 7.4.1 (Ref. 1).

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The Remote Shutdown System is considered an important contributor to the reduction of unit risk to accidents and as such it has been retained in the Technical Specifications as indicated in the NRC Policy Statement.

LCO

The Remote Shutdown System LCO provides the OPERABILITY requirements of the instrumentation and controls necessary to place and maintain the unit in MODE 3 from locations other than the control room. The instrumentation and controls typically required are listed in Bases Table B 3.3.4-1.

The controls, instrumentation, and transfer switches are required for:

- Core reactivity control (initial and long term);
- RCS pressure control;
- Decay heat removal via the AFW System and the SG safety valves;
- RCS inventory control via charging flow; and
- Safety support systems for the above Functions, including service water and component cooling water.

A Function of a Remote Shutdown System is OPERABLE if all instrument and control channels needed to support the Remote Shutdown System Function are OPERABLE. In some cases, the required information or control capability is available from several alternate sources. In these cases, the Function is OPERABLE as long as one channel of any of the alternate information or control sources is OPERABLE.

The remote shutdown instrument and control circuits covered by this LCO do not need to be energized to be considered OPERABLE. This LCO is intended to ensure the instruments and control circuits will be OPERABLE if unit conditions require that the Remote Shutdown System be placed in operation.

(continued)

BASES (continued)

APPLICABILITY

The Remote Shutdown System LCO is applicable in MODES 1, 2, and 3. This is required so that the unit can be placed and maintained in MODE 3 for an extended period of time from a location other than the control room.

This LCO is not applicable in MODE 4, 5, or 6. In these MODES, the unit is already subcritical and in a condition of reduced RCS energy. Under these conditions, considerable time is available to restore necessary instrument control functions if control room instruments or controls become unavailable.

ACTIONS

Note 1 is included which excludes the MODE change restriction of LCO 3.0.4. This exception allows entry into an applicable MODE while relying on the ACTIONS even though the ACTIONS may eventually require a unit shutdown. This exception is acceptable due to the low probability of an event requiring the Remote Shutdown System and because the equipment can generally be repaired during operation without significant risk of spurious trip.

Note 2 has been added to the ACTIONS to clarify the application of Completion Time rules. Separate Condition entry is allowed for each Function listed on Table B 3.3.4-1. The Completion Time(s) of the inoperable channel(s)/train(s) of a Function are tracked separately for each Function starting from the time the Condition was entered for that Function.

A.1

Condition A addresses the situation where one or more required Functions of the Remote Shutdown System are inoperable. This includes any Function listed in Table B 3.3.4-1, as well as the control and transfer switches.

The Required Action is to restore the required Function to OPERABLE status within 30 days. The Completion Time is based on operating experience and the low probability of an event that would require evacuation of the control room.

(continued)

BASES

ACTIONS (continued)

B.1 and B.2

If the Required Action and associated Completion Time of Condition A is not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1

Performance of the CHANNEL CHECK once every 31 days ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Channel deviation criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and readability. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

As specified in the Surveillance, a CHANNEL CHECK is only required for those channels which are normally energized. The Frequency of 31 days is based upon operating experience which demonstrates that channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.4.2

SR 3.3.4.2 verifies each required Remote Shutdown System control circuit and transfer switch performs the intended function. This verification is performed from the remote shutdown panel and locally, as appropriate. Operation of the equipment from the remote shutdown panel is not necessary. The Surveillance can be satisfied by performance of a continuity check. This will ensure that if the control room becomes inaccessible, the unit can be placed and maintained in MODE 3 from the remote shutdown panel and the local control stations. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. (However, this Surveillance is not required to be performed only during a unit outage.) Operating experience demonstrates that remote shutdown control channels usually pass the Surveillance test when performed at the 18 month Frequency.

SR 3.3.4.3

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

The Frequency of 18 months is based upon operating experience and consistency with the typical industry refueling cycle.

REFERENCES

1. UFSAR, Section 7.4.1.

Table B 3.3.4-1 (page 1 of 1)
Remote Shutdown System Instrumentation and Controls

FUNCTION/INSTRUMENT OR CONTROL PARAMETER	REQUIRED NUMBER OF FUNCTIONS
1. Reactivity Control	
a. Source Range Neutron Flux	1
b. Reactor Trip Breaker Position[(a)]	1 per trip breaker
c. Manual Reactor Trip[(a)]	1 per trip breaker
2. Reactor Coolant System (RCS) Pressure Control	
a. Pressurizer Pressure	1
b. Pressurizer Heater Controls	2
3. Decay Heat Removal via Steam Generators (SGs)	
a. RCS Hot Leg Temperature Wide Range Loop A	1
b. RCS Cold Leg Temperature Wide Range Loop A	1
c. Motor Driven AFW Pump Controls	1
d. SG Pressure	1 per SG
e. SG Level (Wide Range)	1 per SG
f. Condensate Storage Tank Level	1
4. RCS Inventory Control	
a. Pressurizer Level	1
b. Charging Pump Controls	1 per pump
c. Refuel Water Storage Tank Level	1
5. Support Functions	
a. Component Cooling Water Pump Controls	1
b. Service Water Pump Controls	1

(a) This function is local indication and manual trip feature at the breaker and applies to Reactor Trip Breakers and Reactor Trip Bypass Breakers that are racked in.

B 3.3 INSTRUMENTATION

B 3.3.5 Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation

BASES

BACKGROUND

The DGs provide a source of emergency power when offsite power is either unavailable or is insufficiently stable to allow safe unit operation. Undervoltage protection will generate an LOP start if a loss of voltage or degraded voltage condition occurs on the emergency bus. There are two LOP start signals for each 480 V emergency bus.

Undervoltage relays with definite time characteristics are provided on each 480 V emergency bus for detecting a sustained degraded voltage condition or a loss of bus voltage. The Loss of Voltage Function is provided by two relays on each bus. These relays are arranged in a one-out-of-two logic, such that either relay will generate an LOP signal if the voltage is below approximately 68% for a short time (loss of bus voltage). The Degraded Voltage Function is provided by three relays on each bus, which are combined in a two-out-of-three logic to generate an LOP signal if the voltage is below approximately 90% for a long period of time (degraded voltage). The LOP start actuation is described in UFSAR, Section 8.3 (Ref. 1).

Trip Setpoints and Allowable Values

The Trip Setpoints used in the relays are based on the Degraded Grid Voltage Study (Ref. 2). The selection of these Trip Setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account.

Trip Setpoints and tolerances are specified for each Function in the LCO. If the measured setpoint falls within the tolerance band, the relay is considered OPERABLE. Operation with a measured setpoint less conservative than the Trip Setpoint, but within the tolerance band, is acceptable provided that operation and testing is consistent with the assumptions of the setpoint calculation. Each Trip Setpoint specified is more conservative than the analytical values determined in Reference 2 in order to account for instrument uncertainties appropriate to the trip function.

(continued)

BASES

BACKGROUND

Trip Setpoints and Allowable Values (continued)

These uncertainties are defined in the company setpoint methodology procedure.

The dropout time delay on the loss of voltage relays is very short, almost instantaneous. This short time delay is necessary to preclude damage to equipment from operating on less than minimum manufacturer's recommended voltage for continuous motor operation. The dropout time delay on the degraded voltage relays is significantly longer. A long time delay is desired such that it will minimize the effects of short duration disturbances on the grid. However, the allowable time duration of a degraded voltage condition must be short enough that it will not result in failure of safety systems or components.

APPLICABLE SAFETY ANALYSES

The LOP DG start instrumentation is required for the Engineered Safety Features (ESF) Systems to function in any accident with a loss of offsite power. Its design basis is that of the ESF Actuation System (ESFAS).

Accident analyses credit the loading of the DG based on the loss of offsite power concurrent with a loss of coolant accident (LOCA). The actual DG start has historically been associated with the ESFAS actuation. The DG loading has been included in the delay time associated with each safety system component requiring DG supplied power following a loss of offsite power. The analyses assume a non-mechanistic DG loading, which does not explicitly account for each individual component of loss of power detection and subsequent actions.

The required channels of LOP DG start instrumentation, in conjunction with the ESF systems powered from the DGs, provide unit protection in the event of any of the analyzed accidents discussed in UFSAR, Chapter 15 (Ref. 3), in which a loss of offsite power is assumed.

The delay times assumed in the safety analysis for the ESF equipment include the 10 second DG start delay, and the appropriate sequencing delay, if applicable. The response times for ESFAS actuated equipment in LCO 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation,"

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

include the appropriate DG loading and sequencing delay.

The LOP DG start instrumentation channels satisfy Criterion 3 of the NRC Policy Statement.

LCO

The LCO for LOP DG start instrumentation requires that two channels per bus of loss of voltage and three channels per bus of degraded voltage Functions be OPERABLE in MODES 1, 2, 3, and 4 when the LOP DG start instrumentation supports safety systems associated with the ESFAS. In MODES 5 and 6, these channels must be OPERABLE whenever the associated DG is required to be OPERABLE to ensure that the automatic start of the DG is available when needed. Loss of the LOP DG Start Instrumentation Function could result in the delay of safety systems initiation when required. This could lead to unacceptable consequences during accidents. For example, during the loss of offsite power the DG powers the motor driven auxiliary feedwater pumps. Failure of these pumps to start would leave only one turbine driven pump, as well as an increased potential for a loss of decay heat removal through the secondary system.

APPLICABILITY

The LOP DG Start Instrumentation Functions are required in MODES 1, 2, 3, and 4 because ESF Functions are designed to provide protection in these MODES. Actuation in MODE 5 or 6 is required whenever the required DG must be OPERABLE so that it can perform its function on an LOP or degraded power to the AC Instrument bus.

A Note has been added in the APPLICABILITY which permits blocking the Degraded Voltage Function when starting a reactor coolant pump. This is an exception which applies in all MODES except MODE 1, and is taken to avoid challenging the trip setpoints with the bus voltage dip normally experienced when a large electrical load is placed on the bus.

ACTIONS

In the event a channel is found inoperable, then the function that channel provides must be declared inoperable

(continued)

BASES

ACTIONS (continued)

and the LCO Condition entered for the particular protection function affected.

Because the required channels are specified on a per bus basis, the Condition may be entered separately for each bus as appropriate.

A Note has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed in the LCO. The Completion Time(s) of the inoperable channel(s) of a Function are tracked separately for each Function starting from the time the Condition was entered for that Function.

A.1

Condition A applies to the LOP DG start Function with one or more loss of voltage channels per bus inoperable.

If one or more channels are inoperable, Required Action A.1 requires that channels be restored to OPERABLE status within one hour. With one or more Loss of Voltage Function channels inoperable, a loss of the required function may have occured.

The 1 hour Completion Time allows for time to repair most failures and takes into account the low probability of an event requiring an LOP actuation during this interval.

B.1

Condition B applies to the LOP Degraded Voltage Function with one degraded voltage channel per bus inoperable.

If one of the three channels is inoperable, Required Action B.1 requires that channel to be placed in trip within 6 hours. With a channel in trip, the LOP DG start instrumentation channels are then configured to provide a one-out-of-two logic to initiate a trip of the incoming offsite power.

(continued)

BASES

ACTIONS

B.1 (continued)

A Note is added to allow bypassing an inoperable channel for up to 4 hours for surveillance testing of other channels. This allowance is made where bypassing the channel does not cause an actuation and where at least two other channels are monitoring that parameter.

The specified Completion Time and time allowed for bypassing one channel are reasonable considering the Function remains fully OPERABLE on every bus and the low probability of an event occurring during these intervals.

C.1

Condition C applies when more than one degraded voltage channel on a single bus is inoperable.

Required Action C.1 requires restoring all but one channel on each bus to OPERABLE status. The 1 hour Completion Time should allow ample time to repair most failures and takes into account the low probability of an event requiring an LOP start occurring during this interval.

D.1

Condition D applies to each of the LOP DG start Functions when the Required Action and associated Completion Time for Condition A, B, or C are not met.

In these circumstances the Conditions specified in LCO 3.8.1, "AC Sources - Operating," or LCO 3.8.2, "AC Sources - Shutdown," for the DG made inoperable by failure of the LOP DG start instrumentation are required to be entered immediately. The actions of those LCOs provide for adequate compensatory actions to assure unit safety.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1

SR 3.3.5.1 is the performance of a TADOT. This test is performed every 18 months. The test checks trip devices that provide actuation signals directly, bypassing the analog process control equipment. The Frequency is based on the known reliability of the relays and controls and the multichannel redundancy available, and has been shown to be acceptable through operating experience.

The SR is modified by a Note that excludes verification of the setpoint from the TADOT. Setpoint verification is accomplished during the CHANNEL CALIBRATION.

SR 3.3.5.2

SR 3.3.5.2 is the performance of a CHANNEL CALIBRATION.

The setpoints, as well as the response to a loss of voltage and a degraded voltage test, should include a single point verification that the trip occurs within the required time delay, as shown in Reference 1.

A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

The Frequency of 18 months is based on operating experience and consistency with the typical industry refueling cycle and is justified by the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

REFERENCES

1. UFSAR, Section 8.3.

2. CP&L Letter to NRC, Serial No. GD-79-2502, dated October 5, 1979, transmitting summary of "Degraded Grid Voltage Study for H.B. Robinson Unit No. 2," Ebasco Services, Incorporated, October 15, 1976

3. UFSAR, Chapter 15.

B 3.3 INSTRUMENTATION

B 3.3.6 Containment Ventilation Isolation Instrumentation

BASES

BACKGROUND

Containment ventilation isolation instrumentation closes the containment isolation valves in the Pressure and Vacuum Relief System and the Purge System. This action isolates the containment atmosphere from the environment to minimize releases of radioactivity in the event of an accident. The Pressure and Vacuum Relief System may be in use during reactor operation and the Purge System will normally be in use with the reactor shutdown.

Containment Ventilation isolation initiates on an automatic safety injection (SI) signal or by manual actuation of Containment Isolation Phase A. The Bases for LCO 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," discuss these modes of initiation.

Two radiation monitoring channels provide actuation signals to containment ventilation isolation. The two channels, the R-11 particulate and the R-12 gaseous, monitor a continuous containment air sample, which is drawn from a single location through the R-11 and R-12 monitors in series and then returned to the containment. Both detectors will respond to most events that release radiation to containment. However, analyses have not been conducted to demonstrate that all credible events will be detected by more than one monitor. Therefore, for the purposes of this LCO the two channels are not considered redundant. Instead, they are treated as two one-out-of-one Functions. Since the purge exhaust monitors constitute a sampling system, various components such as sample line valves, sample pumps, and filter motors are required to support monitor OPERABILITY.

Each of the systems has inner and outer containment isolation valves in its supply and exhaust ducts. A high radiation signal from either of the two channels initiates containment ventilation isolation, which closes both inner and outer containment isolation valves in the Pressure and Vacuum Relief System and the Purge System. These systems are described in the Bases for LCO 3.6.3, "Containment Isolation Valves."

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The containment ventilation isolation radiation monitors ensure closing of the ventilation isolation valves. They are the primary means for automatically isolating containment in the event of a fuel handling accident during shutdown. Containment isolation in turn ensures meeting the containment leakage rate assumptions of the safety analyses, and ensures that the calculated accidental offsite radiological doses are below 10 CFR 100 (Ref. 1) limits.

The containment ventilation isolation instrumentation satisfies Criterion 3 of the NRC Policy Statement.

LCO

The LCO requirements ensure that the instrumentation necessary to initiate Containment Ventilation Isolation, listed in Table 3.3.6-1, is OPERABLE.

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate containment ventilation isolation at any time by using either of two pushbuttons in the control room. Either pushbutton actuates both trains. This action will cause actuation of Phase A and Containment Ventilation Isolation automatic containment isolation valves. Containment Ventilation Isolation can also be initiated by the manual Containment Spray buttons.

The LCO for Manual Initiation ensures the proper amount of redundancy is maintained in the manual actuation circuitry to ensure the operator has manual initiation capability.

Each channel consists of one push button and the interconnecting wiring to the actuation logic cabinet.

2. Automatic Actuation Logic and Actuation Relays

The LCO requires two trains of Automatic Actuation Logic and Actuation Relays OPERABLE. The Automatic Actuation Logic and Actuation Relays actuate containment ventilation isolation upon receipt of an actuation signal from the Containment Radiation or

(continued)

BASES

LCO

2. Automatic Actuation Logic and Actuation Relays (continued)

Manual Initiation Functions. Containment ventilation isolation also initiates on an automatic safety injection (SI) signal when operating in MODES 1, 2, 3, and 4. The Bases for LCO 3.3.2, "Engineered Safety Features Actuation System (ESFAS) Instrumentation," discusses this mode of intitiation.

3. Containment Radiation

The LCO specifies two required channels of radiation monitors to ensure that the radiation monitoring instrumentation necessary to initiate Containment Ventilation Isolation remains OPERABLE.

For sampling systems, channel OPERABILITY involves more than OPERABILITY of the channel electronics. OPERABILITY may also require correct valve lineups, sample pump operation, and filter motor operation, as well as detector OPERABILITY, if these supporting features are necessary for trip to occur under the conditions assumed by the safety analyses.

4. Containment Isolation – Phase A

Refer to LCO 3.3.2, Function 3.a, for all initiating Functions and requirements.

APPLICABILITY

The Manual Initiation, Automatic Actuation Logic and Actuation Relays, and Containment Isolation – Phase A Functions are required to be OPERABLE in MODES 1, 2, 3, and 4, and during CORE ALTERATIONS, or movement of irradiated fuel assemblies within containment. Containment Radiation Functions are required to be OPERABLE during Purging, CORE ALTERATIONS, or movement of irradiated fuel assemblies within containment. Under these conditions, the potential exists for an accident that could release fission product radioactivity into containment. Therefore, the containment ventilation isolation instrumentation must be OPERABLE in these MODES.

(continued)

BASES

APPLICABILITY (continued)

During Purging is defined as opening the containment purge supply and exhaust penetrations and does not include opening the Containment Pressure and Vacuum Relief System.

While in MODES 5 and 6 without fuel handling or Purging operations in progress, the containment ventilation isolation instrumentation need not be OPERABLE since the potential for radioactive releases is minimized and operator action is sufficient to ensure post accident offsite doses are maintained within the limits of Reference 1.

ACTIONS

The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by unit specific calibration procedures. Typically, the drift is found to be small and results in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a COT, when the process instrumentation is set up for adjustment to bring it within specification. If the Trip Setpoint is less conservative than the tolerance specified by the calibration procedure, the channel must be declared inoperable immediately and the appropriate Condition entered.

A Note has been added to the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed in Table 3.3.6-1. The Completion Time(s) of the inoperable channel(s)/train(s) of a Function are tracked separately for each Function starting from the time the Condition was entered for that Function.

A.1 and A.2

Condition A applies to all Containment Ventilation Isolation Functions and addresses the train orientation of the relay logic and the master and slave relays for these Functions. It also addresses the failure of multiple radiation monitoring channels. If a train is inoperable or one or more channels are inoperable, operation may continue as long as the Required Action to place and maintain containment purge supply and exhaust isolation valves in their closed

(continued)

BASES

ACTIONS

A.1 and A.2 (continued)

position is met, and the applicable Conditions of LCO 3.9.3, "Containment Penetrations," are met for each valve made inoperable by failure of isolation instrumentation. The Completion Time for these Required Actions is Immediately.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.6-1 determines which SRs apply to which Containment Ventilation Isolation Functions.

SR 3.3.6.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of the radiation monitor instrumentation has not occurred.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.6.2

SR 3.3.6.2 is the performance of an ACTUATION LOGIC TEST. The train being tested is placed in the test condition. All possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is tested for continuity. This verifies that the logic modules are OPERABLE and there is an intact voltage signal path to the master relay coils. This test is performed every 31 days on a STAGGERED TEST BASIS. The Surveillance interval is acceptable based on instrument reliability and industry operating experience.

SR 3.3.6.3

SR 3.3.6.3 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.3 (continued)

The master relay is actuated by either a manual or automatic initiation of the function being tested. Contact operation is verified either by a continuity check of the circuit containing the master relay or proper operation of the end device during the supported equipment simulated or actual automatic actuation test. This test is performed every 18 months. The 18 month Frequency is adequate, based on industry operating experience, and is consistent with the typical refueling cycle, which provides the plant conditions necessary for testing.

SR 3.3.6.4

A COT is performed every 92 days on each required channel to ensure the entire channel will perform the intended Function. The Frequency is based on the staff recommendation for increasing the availability of radiation monitors according to NUREG-1366 (Ref. 2). This test verifies the capability of the radiation monitor instrumentation to initiate Containment Ventilation System isolation. The setpoint should be left consistent with the calibration procedure tolerance.

SR 3.3.6.5

SR 3.3.6.5 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified either by a continuity check of the circuit containing the slave relay, or by verification of proper operation of the end device during the supported equipment simulated or actual automatic actuation test. This test is performed every 18 months. The 18 month Frequency is adequate, based on industry operating experience, and is consistent with the typical refueling cycle, which provides the plant conditions necessary for testing.

SR 3.3.6.6

SR 3.3.6.6 is the performance of a TADOT. This test is a check of the Manual Actuation Functions and is performed

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.6 (continued)

every 18 months. Each Manual Actuation Function is tested up to, and including, the master relay coils. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.).

The test also includes trip devices that provide actuation signals directly to the relay logic, bypassing the analog process control equipment. The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Functions tested have no setpoints associated with them.

The Frequency is based on the known reliability of the Function and the redundancy available, and has been shown to be acceptable through operating experience.

SR 3.3.6.7

A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

The Frequency is based on operating experience and is consistent with the typical industry refueling cycle.

REFERENCES

1. 10 CFR 100.11.
2. NUREG-1366, "Improvements to Technical Specification Surveillance Requirements," December, 1992.

B 3.3 INSTRUMENTATION

B 3.3.7 Control Room Emergency Filtration System (CREFS) Actuation Instrumentation

BASES

BACKGROUND

The CREFS provides an enclosed control room environment from which the unit can be operated following an uncontrolled release of radioactivity. During normal operation, the Control Room Ventilation System provides control room ventilation. Upon receipt of an actuation signal, the CREFS initiates filtered ventilation and pressurization of the control room. This system is described in the Bases for LCO 3.7.9, "Control Room Emergency Filtration System."

The CREFS is actuated by the control room area radiation monitor, R-1, on a high radiation signal. A high radiation signal from R-1 will initiate both trains of CREFS. However, the trains are arranged such that train A leads train B. While both trains receive an actuation signal, train B will not start if the low flow interlock with train A clears within its set time delay. CREFS can also be initiated by manually positioning the dampers and energizing the fans. The CREFS is also actuated by a safety injection (SI) signal. The SI Function is discussed in LCO 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation."

APPLICABLE SAFETY ANALYSES

The control room must be kept habitable for the operators stationed there during accident recovery and post accident operations.

The CREFS operates in two modes. The emergency pressurization mode serves to maintain the control room envelope at a positive pressure with respect to adjacent areas, with an air makeup rate of 400 CFM or less. Operation in the emergency circulation mode terminates the supply of unfiltered outside air to the control room envelope. These actions are necessary to ensure the control room is kept habitable for the operators stationed there during accident recovery and post accident operations by minimizing the radiation exposure of control room personnel.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The radiation monitor actuation of the CREFS during movement of irradiated fuel assemblies, and CORE ALTERATIONS, is the primary means to ensure control room habitability in the event of a fuel handling or waste gas decay tank rupture accident.

The CREFS actuation instrumentation satisfies Criterion 3 of the NRC Policy Statement.

LCO

The LCO requirements ensure that instrumentation necessary to initiate the CREFS is OPERABLE.

1. Automatic Actuation Logic and Actuation Relays

The LCO requires two trains of Actuation Logic and Relays OPERABLE to ensure that no single random failure can prevent automatic actuation. Automatic Actuation Logic and Actuation Relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b., SI, in LCO 3.3.2. The applicable MODES and specified conditions for the CREFS portion of these functions are different and less restrictive than those specified for their SI roles. If one or more of the SI functions becomes inoperable in such a manner that only the CREFS function is affected, the Conditions applicable to their SI function need not be entered. The less restrictive Actions specified for inoperability of the CREFS Functions specify sufficient compensatory measures for this case.

2. Control Room Radiation Monitor

The LCO requires one Control Room Area Radiation Monitor OPERABLE to initiate the CREFS.

3. Safety Injection

Refer to LCO 3.3.2, Function 1, for all initiating Functions and requirements.

(continued)

BASES (continued)

APPLICABILITY

The CREFS Functions must be OPERABLE in MODES 1, 2, 3, 4, and during CORE ALTERATIONS and movement of irradiated fuel assemblies.

ACTIONS

The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the unit specific calibration procedures. Typically, the drift is found to be small and results in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a COT, when the process instrumentation is set up for adjustment to bring it within specification. If the Trip Setpoint is less conservative than the tolerance specified by the calibration procedure, the channel must be declared inoperable immediately and the appropriate Condition entered.

A Note has been added to the ACTIONS indicating that separate Condition entry is allowed for each Function. The Conditions of this Specification may be entered independently for each Function listed in Table 3.3.7-1 in the accompanying LCO. The Completion Time(s) of the inoperable channel(s)/train(s) of a Function are tracked separately for each Function starting from the time the Condition was entered for that Function.

A.1

Condition A applies to the automatic actuation Function of the CREFS.

If one train is inoperable, 7 days are permitted to restore it to OPERABLE status. The 7 day Completion Time is the same as is allowed if one train of the mechanical portion of the system is inoperable. The basis for this Completion Time is the same as provided in LCO 3.7.9. If the channel/train cannot be restored to OPERABLE status, one CREFS train must be placed in the emergency pressurization mode of operation. This accomplishes the actuation instrumentation Function and places the unit in a conservative mode of operation.

(continued)

BASES

ACTIONS (continued)

B.1.1, B.1.2, and B.2

Condition B applies to the failure of two CREFS actuation trains, or the radiation monitor channel. The first Required Action is to place one CREFS train in the emergency pressurization mode of operation immediately. This accomplishes the actuation instrumentation Function that may have been lost and places the unit in a conservative mode of operation. The applicable Conditions and Required Actions of LCO 3.7.9 must also be entered for the CREFS train made inoperable by the inoperable actuation instrumentation. This ensures appropriate limits are placed upon train inoperability as discussed in the Bases for LCO 3.7.9.

Alternatively, the radiation monitoring channel may be placed in the trip condition. This action will start the preferred CREFS train in the emergency pressurization mode, and line up the redundant CREFS train in a stand-by mode, such that it will start in the emergency pressurization mode upon failure of the operating CREFS train. As noted (Note to Required Action B.2), the option to place the radiation monitoring channel in trip is not applicable to the automatic actuation trains.

C.1 and C.2

Condition C applies when the Required Action and associated Completion Time for Condition A or B have not been met and the unit is in MODE 1, 2, 3, or 4. The unit must be brought to a MODE in which the LCO requirements are not applicable. To achieve this status, the unit must be brought to MODE 3 within 6 hours and MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

D.1 and D.2

Condition D applies when the Required Action and associated Completion Time for Condition A or B have not been met during CORE ALTERATIONS or when irradiated fuel assemblies are being moved. Movement of irradiated fuel assemblies and

(continued)

BASES

ACTIONS

D.1 and D.2 (continued)

CORE ALTERATIONS must be suspended immediately to reduce the risk of accidents that would require CREFS actuation.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.7-1 determines which SRs apply to which CREFS Actuation Functions.

SR 3.3.7.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of radiation monitor instrumentation has not occurred.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.7.2

A COT is performed once every 92 days on the required radiation monitor channel to ensure the entire channel will perform the intended function. This test verifies the capability of the instrumentation to provide actuation of both CREFS trains. The setpoint should be left consistent with the unit specific calibration procedure tolerance. The Frequency is based on the known reliability of the monitoring equipment and has been shown to be acceptable through operating experience.

SR 3.3.7.3

SR 3.3.7.3 is the performance of an ACTUATION LOGIC TEST. The train being tested is placed in the test condition. All possible logic combinations, with and without applicable permissives, are tested for each protection function. In addition, the master relay coil is tested for continuity. This verifies that the logic modules are OPERABLE and there

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.7.3 (continued)

is an intact voltage signal path to the master relay coils. This test is performed every 31 days on a STAGGERED TEST BASIS. The Frequency is justified in WCAP-10271-P-A, Supplement 2, Rev. 1 (Ref. 1).

SR 3.3.7.4

SR 3.3.7.4 is the performance of a MASTER RELAY TEST. The MASTER RELAY TEST is the energizing of the master relay. The master relay is actuated by either a manual or automatic initiation of the function being tested. Contact operation is verified either by a continuity check of the circuit containing the master relay or proper operation of the end device during the supported equipment simulated or actual automatic actuation test. This test is performed every 18 months. The 18 month Frequency is adequate, based on industry operating experience, and is consistent with the typical refueling cycle, which provides the plant conditions necessary for testing.

SR 3.3.7.5

SR 3.3.7.5 is the performance of a SLAVE RELAY TEST. The SLAVE RELAY TEST is the energizing of the slave relays. Contact operation is verified either by a continuity check of the circuit containing the slave relay, or by verification of proper operation of the end device during the supported equipment simulated or actual automatic actuation test. This test is performed every 18 months. The 18 month Frequency is adequate, based on industry operating experience, and is consistent with the typical refueling cycle, which provides the plant conditions necessary for testing.

SR 3.3.7.6

A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

(continued)

BASES

SURVEILLANCE REQUIREMENTS	SR 3.3.7.6 (continued) The Frequency is based on operating experience and is consistent with the typical industry refueling cycle.
REFERENCES	1. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.

B 3.3 INSTRUMENTATION

B 3.3.8 Auxiliary Feedwater (AFW) System Instrumentation

BASES

BACKGROUND

The AFW System automatically supplies feedwater to the steam generators (SGs) to remove decay heat from the Reactor Coolant System (RCS) upon loss of normal feedwater supply. The AFW System can provide feedwater to the SGs from any one or combination of three AFW pumps, two of which are motor driven and the third of which is steam turbine driven.

The two motor driven AFW pumps are powered from emergency busses E-1 and E-2. These busses also supply power to the motor driven AFW pump discharge isolation valves and the turbine driven AFW pump steam supply and feedwater discharge isolation valves. The turbine driven AFW pump provides a second independent and diverse means of providing auxiliary feedwater to the SGs.

Initiation of an automatic actuation signal to the turbine driven AFW pump causes the turbine steam supply valves and the pump feedwater discharge isolation valves to open. An automatic actuation signal to the motor driven AFW pumps cause the pumps to become energized and accelerate up to speed, and the feedwater discharge isolation valves to open.

Two trains of AFW actuation relay logic are used to develop the coincident signals from the process inputs. Logic train A starts one motor driven AFW pump and Logic train B starts the second motor driven AFW pump. Each logic train independently actuates the turbine driven AFW pump.

The AFW automatic actuation instrumentation is discussed in UFSAR Section 7.3.1 (Ref. 1). The instrumentation is designed in accordance with HBRSEP design criteria, which is described in UFSAR Section 3.1 (Ref. 2).

APPLICABLE SAFETY ANALYSES

The AFW System mitigates the consequences of any event with loss of normal feedwater. The design basis of the AFW System is to supply water to the SGs to remove decay heat and other residual heat by delivering at least the minimum required flow rate to the SGs at pressures corresponding to

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

the lowest main steam safety valve (MSSV) set pressure plus 3%.

In addition, the AFW System must supply enough makeup water to replace SG secondary inventory lost as the unit cools to MODE 4 conditions. Sufficient AFW flow must also be available to account for flow losses such as pump recirculation and line breaks.

The limiting Design Basis Accidents (DBAs) and transients for the AFW System are as follows:

a. Feedwater Line Break (FWLB); and

b. Loss of main feedwater (MFW).

In addition, the minimum available AFW flow and system characteristics are serious considerations in the analysis of a small break loss of coolant accident (LOCA).

The AFW System design is such that, in the event of a complete loss of offsite power, decay heat removal would continue to be assured by the availability of either the turbine driven AFW pump, or one of the two motor driven AFW pumps, along with steam discharge to the atmosphere through the MSSVs.

The AFW System actuation instrumentation satisfies Criterion 3 of the NRC Policy Statement.

LCO

This LCO provides assurance that the AFW System will perform its design safety function to mitigate the consequences of accidents that could result in overpressurization of the reactor coolant pressure boundary.

The LCO requires all instrumentation performing an AFW System actuation function to be OPERABLE. Failure of any instrument renders the affected channel(s) inoperable and reduces the reliability of the affected Functions.

The required channels of AFW System actuation instrumentation provide unit protection in the event of any of the analyzed accidents. AFW System actuation instrumentation protection functions are as follows:

(continued)

BASES

LCO (continued)

1. Steam Generator Water Level - Low Low

SG Water Level - Low Low provides protection against a loss of heat sink. A feed line break, inside or outside of containment, or a loss of MFW, would result in a loss of SG water level. SG Water Level - Low Low provides input to the SG Level Control System. Two-out-of-three signals on one SG will start the motor driven AFW pumps. Two-out-of-three signals on two SGs will start the steam driven AFW pump. Thus, three OPERABLE channels are required to satisfy the requirements with two-out-of-three logic.

2. Safety Injection (SI)

An SI signal starts the two motor driven AFW pumps. The AFW initiation functions are the same as the requirements for their SI function. Therefore, the requirements are not repeated in Table 3.3.8-1. Instead, Table 3.3.2-1, Function 1 (Safety Injection), is referenced for all initiating functions and requirements.

3. Loss of Offsite Power

A loss of offsite power to the 480 V emergency busses will be accompanied by a loss of MFW and reactor coolant pumping power, and the subsequent need for some method of decay heat removal. The loss of offsite power is detected by a voltage drop on each emergency bus. Loss of power to either emergency bus will start the motor driven AFW pumps in the station blackout loading sequence to ensure that at least one SG contains enough water to serve as the heat sink for reactor decay heat and sensible heat removal following the reactor trip.

4. Undervoltage- Reactor Coolant Pump (RCP)

A loss of power on 4 kV buses 1 and 4, which provide power to both MFW pumps and two RCPs, provides

(continued)

BASES

LCO

4. Undervoltage- Reactor Coolant Pump (continued)

indication of a loss of MFW and forced flow in the RCS. Two sensors are provided on each bus, with two-out-of-two logic on both busses required to start the turbine driven AFW pump to ensure that at least one SG contains enough water to serve as the heat sink for reactor decay heat and sensible heat removal following the reactor trip.

5. Trip of All Main Feedwater Pumps

A Trip of both MFW pumps is an indication of a loss of MFW and the subsequent need for some method of decay heat and sensible heat removal to bring the reactor back to no load temperature and pressure conditions. One contact on each MFW pump circuit breaker position provides input to the actuation logic that starts the motor driven AFW pumps. A trip of both MFW pumps starts the two motor driven AFW pumps to ensure that at least one SG is available with water to act as the heat sink for the reactor.

APPLICABILITY

Functions 1 through 4 must be OPERABLE in MODES 1, 2, and 3 to ensure that the SGs remain the heat sink for the reactor. These Functions do not have to be OPERABLE in MODES 5 and 6 because there is not enough heat being generated in the reactor to require the SGs as a heat sink. In MODE 4, AFW automatic actuation does not need to be OPERABLE because either AFW or residual heat removal (RHR) will already be in operation to remove decay heat, or sufficient time will be available to manually place either system in operation.

Function 5 must be OPERABLE in MODES 1 and 2. This ensures that at least one SG is provided with water to serve as the heat sink to remove reactor decay heat and sensible heat in the event of an accident. In MODES 3, 4, and 5, the MFW pumps may be normally shut down, and thus neither pump trip is indicative of a condition requiring automatic AFW actuation.

(continued)

BASES (continued)

ACTIONS

A Note has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed on Table 3.3.8-1.

In the event a channel's Trip Setpoint is found nonconservative with respect to the Allowable Value, or the transmitter, instrument loop, signal processing electronics, or bistable is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the LCO Condition(s) entered for the Function(s) affected. When the Required Channels in Table 3.3.8-1 are specified (e.g., on a per bus or per pump basis), then the Condition may be entered separately for each bus or pump, etc., as appropriate.

A.1

Condition A applies to all AFW Functions, and addresses the situation where one or more channels or trains for one or more Functions are inoperable at the same time. The Required Action is to refer to Table 3.3.8-1 and to take the Required Actions for the Functions affected. The Completion Times are those from the referenced Conditions and Required Actions.

B.1, B.2.1, and B.2.2

Condition B applies to SG Water Level – Low Low and Undervoltage-Reactor Coolant Pump. If one channel is inoperable, 6 hours are allowed to restore the channel to OPERABLE status or to place it in the tripped condition. A failure of one SG Water Level-Low Low channel places the Function in a two-out-of-two configuration. One channel must be tripped to place the Function in a one-out-of-two configuration. A failure of one Undervoltage-Reactor Coolant Pump channel places the Function in an unacceptable configuration. The inoperable channel must be tripped to place the Function in a one-out-of-one coincident with a two-out-of-two configuration.

Failure to restore the inoperable channel to OPERABLE status or place it in the tripped condition within 6 hours requires

(continued)

BASES

ACTIONS

B.1, B.2.1, and B.2.2 (continued)

the unit be placed in MODE 3 within the following 6 hours and MODE 4 within the next 6 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. In MODE 4, these Functions are no longer required OPERABLE.

C.1, C.2.1, and C.2.2

Condition C applies to Loss of Offsite Power. This action recognizes the lack of manual trip provision for a failed channel. If a channel is inoperable, 48 hours are allowed to return it to OPERABLE status. The specified Completion Time is reasonable considering the nature of this Function, the available redundancy, and the low probability of an event occurring during this interval. If the Function cannot be returned to OPERABLE status, the unit must be placed in MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power in an orderly manner and without challenging unit systems. In MODE 4, the unit does not have any analyzed transients or conditions that require the explicit use of the protection functions noted above.

D.1 and D.2

Condition D applies to the AFW pump start on trip of all MFW pumps. This action addresses the relay logic for the auto start function of the AFW System on loss of all MFW pumps. The OPERABILITY of the AFW System must be assured by allowing automatic start of the AFW System pumps. If a channel is inoperable, 48 hours are allowed to return it to an OPERABLE status. If the Function cannot be returned to an OPERABLE status, 6 hours are allowed to place the unit in MODE 3. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without

(continued)

BASES

ACTIONS

D.1 and D.2 (continued)

challenging unit systems. In MODE 3, the unit does not have any analyzed transients or conditions that require the explicit use of the protection function noted above. The allowance of 48 hours to return the train to an OPERABLE status is justified in WCAP-10271-P-A (Ref. 3).

SURVEILLANCE REQUIREMENTS

The SRs for each AFW Actuation Function are identified by the SRs column of Table 3.3.8-1.

A Note has been added to the SR Table to clarify that Table 3.3.8-1 determines which SRs apply to which Functions.

The CHANNEL CALIBRATION and COTs are performed in a manner that is consistent with the assumptions used in analytically calculating the required channel accuracies.

SR 3.3.8.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Channel deviation criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and reliability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.8.1 (continued)

supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.8.2

SR 3.3.8.2 is the performance of a COT. A COT is performed on each required channel to ensure the entire channel, with the exception of the transmitter sensing device, will perform the intended Function. Setpoints must be found within the tolerances and Allowable Values specified in Table 3.3.8-1.

The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology. The setpoint must be left set consistent with the assumptions of the setpoint methodology.

The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis in Reference 3 when applicable.

The Frequency of 92 days is justified in Reference 3.

SR 3.3.8.3

SR 3.3.8.3 is the performance of a TADOT. This test is a check of AFW automatic pump start on loss of offsite power, undervoltage RCP, and trip of all MFW pumps Functions. It is performed every 18 months. Each applicable Actuation Function is tested up to, and including, the end device start circuitry. In some instances, the test includes actuation of the end device (i.e., pump starts, valve cycles, etc.). As noted, this SR requires the injection of a simulated or actual signal for the Trip of Main Feedwater Pumps Function. The injection of the signal should be as close to the sensor as practical. The Frequency is adequate, based on industry operating experience and is consistent with the typical refueling cycle.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.8.4

SR 3.3.8.4 is the performance of a CHANNEL CALIBRATION. A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter within the necessary range and accuracy.

CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint methodology. The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology.

The Frequency of 18 months is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint methodology.

REFERENCES

1. UFSAR, Section 7.3.1

2. UFSAR, Section 3.1

3. WCAP-10271-P-A, Supplement 2, Rev. 1., June 1990

SUPPLEMENT 4
CONVERSION PACKAGE SECTION 3.4
PAGE INSERTION INSTRUCTIONS

Remove and insert the following pages into Enclosure 12 to Serial: RNP-RA/96-0141.

	Remove Page	Insert Page
a.	Part 1, "Markup of Current Technical Specifications (CTS)"	
	NA	
b.	Part 2, "Discussion of Changes (DOCs) for CTS Markup"	
	28 and 29	28 and 29
c.	Part 3, "No significant Hazards Consideration (NSHC), And Basis for Categorical Exclusion from 10 CFR 51.22"	
	9	9
d.	Part 4, "Markup of NUREG-1431, Revision 1, Standard Technical Specifications Westinghouse Plants, (ISTS)"	
	3.4-17	3.4-17
e.	Part 5, "Justification of Differences (JFDs) to ISTS"	
	7	7
f.	Part 6, "Markup of ISTS Bases"	
	B 3.4-38	B 3.4-38
	Insert B 3.4.8-1 (no page number)	B 3.4-38a
g.	Part 7, "Justification of Differences (JFDs) to ISTS Bases"	
	NA	
h.	Part 8, "Proposed HBRSEP, Unit No. 2 ITS"	
	3.4-1 and 3.4-19	3.4-1 and 3.4-19
i.	Part 9, "Proposed Bases to HBRSEP, Unit No. 2 ITS"	
	B 3.4-40, B 3.4-41	B 3.4-40, B 3.4-41
	-	B 3.4-41a
j.	Part 10, "ISTS Generic Changes"	
	NA	

L4 CTS Specification 3.3.1.4.b requires that, if both RHR loops become inoperable, all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere be closed prior to the RCS average temperature exceeding 200°F. This requirement is not retained in the ITS. This is a relaxation of requirements, and is less restrictive. This change is acceptable, however, since ITS Specifications 3.4.7 and 3.4.8 require in this condition, that all operations involving a reduction in boron concentration be suspended, and that action be initiated immediately to restore one RHR train to OPERABLE status and operation. In this condition, both decay heat removal is lost and proper boron mixing in the RCS is lost. The Bases to ITS LCO 3.4.7 and 3.4.8 Condition B adequately address the requirements for mixing in the RCS. The site Shutdown Risk requirements specifically address decay heat removal concerns while shutdown and provide appropriate safety considerations in removing RHR trains from service. If these commitments were not met and the plant were in ITS LCO 3.4.7 and 3.4.8 Condition B, a MODE change to MODE 4 may be eventually forced due to the loss of decay heat removal. Since ITS requires containment integrity to be met prior to entry into MODE 4, the CTS requirement effectively imposes no restriction beyond that which would be required for a change from MODE 5 to MODE 4. Therefore the CTS requirement to close all containment penetrations providing direct access from the containment atmosphere prior to the RCS exceeding 200°F is not needed to protect the public health and safety. This change is consistent with NUREG-1431.

L5 The CTS is revised to adopt ITS Specification 3.4.7 LCO "Note 2," and Specification 3.4.8 LCO "Notes 1 and 2." The Note 1 permits all RHR pumps to be de-energized for up to 15 minutes when switching from one train to another or to perform testing of the RHR loop supply valves. Note 2 allows one RHR train to be inoperable and deenergized (for Specification 3.4.7 Note 2) for a period of up to 2 hours. This is a relaxation of requirements, and is less restrictive. This change is acceptable, however, because the circumstances for stopping both RHR pumps are limited to situations when the outage time is short and core outlet temperature is maintained > 10°F below saturation temperature. Boron dilution and draining operations are prohibited when RHR forced flow is stopped thus reducing risk of boron stratification. An RHR train is only permitted to be inoperable for a period of 2 hours provided the other train is OPERABLE. This permits periodic surveillance tests to be performed on the inoperable train during the only time when these tests are safe and possible. This change is consistent with NUREG-1431.

L6 CTS Specification 3.3.1.4 requires that both RHR loops be OPERABLE in the cold shutdown condition. ITS Specification 3.4.7 requires, when in MODE 5 with the RCS loops filled, that either both RHR trains be OPERABLE, or one RHR train and one SG be OPERABLE. A SG is considered OPERABLE as a redundant heat removal source if RCS and SG conditions are

such that natural circulation can be achieved. Actions to ensure these conditions are present, prior to assuming the SG is capable of replacing an RHR loop, are contained in the normal operating procedures and are not provided in the specification. This change provides more flexibility in operation, and is therefore less restrictive. This change is acceptable, however, because with either choice, redundant decay heat removal systems are OPERABLE and available for use. In MODE 5 with the RCS loops filled, the primary function of the reactor coolant is the removal of decay heat and transfer this heat either to the steam generator (SG) secondary side coolant or the component cooling water via the residual heat removal (RHR) heat exchangers. While the principal means for decay heat removal is via the RHR System, the SGs are specified as a backup means for redundancy when the RCS is not vented. Even though the SGs cannot produce steam in this MODE, they are capable of being a heat sink due to their large contained volume of secondary water. As long as the SG secondary side water is at a lower temperature than the reactor coolant, heat transfer will occur. The rate of heat transfer is directly proportional to the temperature difference. This change is consistent with NUREG-1431.

L7 CTS Specification 3.1.1.3.c.1 requires that pressurizer code safety valve lift settings be between 2485 psig and 2560 psig. ITS Specification 3.4.10 requires that safety valve lift settings be between 2410 psig and 2560 psig. This is a relaxation of requirements, and is less restrictive. This change is acceptable, however, since the same level of overpressure protection is provided. The wider OPERABILITY range of 2485 psig $\pm$ 3% allows for drift during valve setpoint test intervals, as permitted by Section III of the ASME Code. During setpoint testing, the valves are reset to 2485 psig $\pm$ 1%, as required by Section XI of the ASME Code. This change is consistent with NUREG-1431.

L8 CTS Specification 3.3.1.3 requires that the SI pump breakers be racked out when RCS temperature is below 350°F and the system is not vented to containment atmosphere. ITS LCO 3.4.12.c requires all but one SI pump to be made incapable of injecting into the RCS when the RCS temperature is ≥ 175°F. This is a relaxation of requirements, and is less restrictive. This change is acceptable based on a new overpressure protection analysis that has been performed to allow OPERABILITY of one train of SI in MODE 4. This analysis assumes one SI pump capable of injection into the RCS with RCS temperature ≥ 175°F and < 350°F.

L9 CTS Specification 3.1.1.3.c, which requires that all three pressurizer code safety valves be operable when RCS temperature is above 350°F, is revised to add ITS LCO 3.4.10 NOTE, which allows the safety valve lift settings to be outside the LCO limits for the purpose of setting the safety valves under ambient (hot) conditions. Because this note allows the pressurizer safety valves to be potentially inoperable in MODE 3 until the safety valves can be tested and set, this change is less

integrity during CORE ALTERATIONS and movement of irradiated fuel assemblies within containment. Therefore, this change does not involve an increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not involve any physical alteration of plant systems, structures or components, nor does it alter parameters governing normal plant operation. The proposed change does not introduce a new mode of operation or alter the method of normal plant operation. Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.

3. Does this change involve a significant reduction in a margin of safety?

   There are no margins of safety, related to safety analyses, that are dependent upon the proposed change. The requirements will continue to safeguard against positive reactivity addition during cold shutdown and protect against the unnecessary removal of an RHR train through the site Shutdown Risk approach. Therefore, this change does not involve a reduction in a margin of safety.

LESS RESTRICTIVE CHANGES
("L5" Labeled Comments/Discussions)

Carolina Power & Light Company has evaluated the proposed Technical Specification change and has concluded it does not involve a significant hazards consideration. Our conclusion is in accordance with the criteria set forth in 10 CFR 50.92. The bases for the conclusion that the proposed change does not involve a significant hazards consideration are discussed below.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   The proposed change does not involve any physical alteration of plant systems, structures or components, changes in parameters governing normal plant operation, or methods of operation. This change permits de-energizing all RHR pumps for up to 15 minutes when switching from one train to another or to perform testing of the RHR loop supply valves, and allows one RHR train to be inoperable for up to 2 hours. Operation in this condition is limited to situations where the outage time is short and the core outlet temperature is maintained >10°F below saturation temperature. Operation with an RHR train inoperable for 2 hours is only permitted with the provision that the other train is OPERABLE. Therefore, this change does not involve an increase in the probability or consequences of an accident previously evaluated.

CTS

(1) (7)

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.8 RCS Loops – MODE 5, Loops Not Filled

[3.3.1.4] LCO 3.4.8 Two residual heat removal (RHR) loops [trains] shall be OPERABLE and one RHR loop [train] shall be in operation.

[L5]

-----NOTES-----

1. All RHR pumps may be de-energized for ≤ 15 minutes when switching from one loop [train] to another [or to perform testing of the RHR loop supply valves (34)] provided:
   a. [The core outlet temperature is maintained > 10°F below saturation temperature.]
   b. No operations are permitted that would cause a reduction of the RCS boron concentration; and
   c. No draining operations to further reduce the RCS water volume are permitted.

[L5]

2. One RHR loop [train] may be inoperable for ≤ 2 hours for surveillance testing provided that the other RHR loop [train] is OPERABLE and in operation. (10)

[3.3.1.4] APPLICABILITY: MODE 5 with RCS loops not filled.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
[3.3.1.4.a] A. One RHR loop [train] inoperable.	A.1	Initiate action to restore RHR loop [train] to OPERABLE status.	Immediately

(continued)

Supplement 4

number of steam generators to be greater than or equal to a specified plant specific value. LCO 3.4.7.b of the HBRSEP Unit No.2 ITS is revised to require that the required steam generator also be OPERABLE. The requirement for the steam generator to be OPERABLE is specified in the Bases of ISTS 3.4.7. This change is being done to provide consistency between the requirements in the LCO and the description of these requirements in the associated Bases.

32 ISTS LCO 3.4.5 Condition C, and associated Required Actions, are modified in ITS 3.4.5 Condition C and associated Required Actions to provide a condition, other than LCO 3.0.3, when requirements of the LCO associated with precluding a rod withdrawal accident are not met and that are not covered by Conditions A or D.

33 ISTS LCO 3.4.5 Condition D, is modified in ITS 3.4.5 to add the condition, other than LCO 3.0.3, when the Completion Time of Required Action C.1 is not met. This change is necessary to require actions D.1, D.2, and D.3 to be performed immediately to preclude conditions of the LCO that are not met from continuing to be outside of the applicable safety analyses beyond the allowed one (1) hour of Required Action C.1.

34 Note 1 to ISTS 3.4.8, RCS Loops-MODE 5, Loops Not Filled, allows all RHR pumps to be de-energized for ≤ 15 minutes when switching from one train to another. Note 1 to ITS 3.4.8 allows all RHR pumps to be de-energized for ≤ 15 minutes when switching from one train to another or to perform testing of the RHR loop supply valves. The additional allowance of "or to perform testing of the RHR loop supply valves" is provided since the HBRSEP Unit No. 2 RHR System design requires de-energization of all RHR pumps in order to perform testing of the RHR loop supply valves (the RHR loop supply valves are common to both RHR trains). This change is acceptable since during this testing the RHR trains must still be maintained OPERABLE. This is accomplished with a dedicated operator, stationed at the controls of the valve and in continuous communication with the control room. In this way, the associated valve can be reopened when a need for residual heat removal operation is indicated.

BASES

LCO (continued)

Note 1 permits all RHR pumps to be de-energized for ≤ 15 minutes when switching from one loop to another. The circumstances for stopping both RHR pumps are to be limited to situations when the outage time is short and core outlet temperature is maintained > 10°F below saturation temperature. The Note prohibits boron dilution or draining operations when RHR forced flow is stopped.

Note 2 allows one RHR loop to be inoperable for a period of ≤ 2 hours, provided that the other loop is OPERABLE and in operation. This permits periodic surveillance tests to be performed on the inoperable loop during the only time when these tests are safe and possible.

An OPERABLE RHR loop is comprised of an OPERABLE RHR pump capable of providing forced flow to an OPERABLE RHR heat exchanger. RHR pumps are OPERABLE if they are capable of being powered and are able to provide flow if required.

APPLICABILITY

In MODE 5 with loops not filled, this LCO requires core heat removal and coolant circulation by the RHR System.

Operation in other MODES is covered by:

LCO 3.4.4, "RCS Loops - MODES 1 and 2";
LCO 3.4.5, "RCS Loops - MODE 3";
LCO 3.4.6, "RCS Loops - MODE 4";
LCO 3.4.7, "RCS Loops - MODE 5, Loops Filled";
LCO 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation - High Water Level" (MODE 6); and
LCO 3.9.6, "Residual Heat Removal (RHR) and Coolant Circulation - Low Water Level" (MODE 6).

ACTIONS

A.1

If only one RHR loop is OPERABLE and in operation, redundancy for RHR is lost. Action must be initiated to restore a second loop to OPERABLE status. The immediate Completion Time reflects the importance of maintaining the availability of two paths for heat removal.

(continued)

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ITS Insert B.3.4.8-1

Testing of the RHR loop supply valves can not be performed without de-energizing all RHR pumps since the valves are common to both RHR trains. Therefore, Note 1 also allows de-energization of all RHR pumps for ≤ 15 minutes when performing testing of the RHR loop supply valves. During this testing the RHR trains are still considered to be OPERABLE since a dedicated operator is stationed at the controls of the valve and is in continuous communication with the control room. In this way, the associated valve can be reopened when a need for residual heat removal operation is indicated.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.1 RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits

LCO 3.4.1 RCS DNB parameters for pressurizer pressure, RCS average temperature, and RCS total flow rate shall be within the limits specified below:

a. Pressurizer pressure ≥ 2205 psig;

b. RCS average temperature ≤ 579.4°F; and

c. RCS total flow rate ≥ 97.3 x 10^6 lbm/hr.

APPLICABILITY: MODE 1.

-----NOTE-----
Pressurizer pressure limit does not apply during:

a. THERMAL POWER ramp > 5% RTP per minute; or

b. THERMAL POWER step > 10% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more RCS DNB parameters not within limits.	A.1 Restore RCS DNB parameter(s) to within limit.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 2.	6 hours

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.8 RCS Loops – MODE 5, Loops Not Filled

LCO 3.4.8 Two residual heat removal (RHR) trains shall be OPERABLE and one RHR train shall be in operation.

------------------------------NOTES------------------------------

1. All RHR pumps may be de-energized for ≤ 15 minutes when switching from one train to another or to perform testing of the RHR loop supply valves provided:

   a. The core outlet temperature is maintained > 10°F below saturation temperature.

   b. No operations are permitted that would cause a reduction of the RCS boron concentration; and

   c. No draining operations to further reduce the RCS water volume are permitted.

2. One RHR train may be inoperable for ≤ 2 hours for surveillance testing provided that the other RHR train is OPERABLE.

APPLICABILITY: MODE 5 with RCS loops not filled.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHR train inoperable.	A.1 Initiate action to restore RHR train to OPERABLE status.	Immediately

(continued)

BASES

LCO (continued)

Note 1 permits all RHR pumps to be de-energized for ≤ 15 minutes when switching from one train to another. The circumstances for stopping both RHR pumps are to be limited to situations when the outage time is short and core outlet temperature is maintained > 10°F below saturation temperature. The Note prohibits boron dilution or draining operations when RHR forced flow is stopped. Testing of the RHR loop supply valves can not be performed without de-energizing all RHR pumps since the valves are common to both RHR trains. Therefore, Note 1 also allows de-energization of all RHR pumps for ≤ 15 minutes when performing testing of the RHR loop supply valves. During this testing the RHR trains are still considered to be OPERABLE since a dedicated operator is stationed at the controls of the valve and is in continuous communication with the control room. In this way, the associated valve can be reopened when a need for residual heat removal operation is indicated.

Note 2 allows one RHR train to be inoperable for a period of ≤ 2 hours, provided that the other train is OPERABLE. This permits periodic surveillance tests to be performed on the inoperable train during the only time when these tests are safe and possible.

An OPERABLE RHR train is comprised of an OPERABLE RHR pump capable of providing forced flow to an OPERABLE RHR heat exchanger. RHR pumps are OPERABLE if they are capable of being powered and are able to provide flow if required.

APPLICABILITY

In MODE 5 with loops not filled, this LCO requires core heat removal and coolant circulation by the RHR System.

Operation in other MODES is covered by:

LCO 3.4.4, "RCS Loops – MODES 1 and 2";
LCO 3.4.5, "RCS Loops – MODE 3";
LCO 3.4.6, "RCS Loops – MODE 4";
LCO 3.4.7, "RCS Loops – MODE 5, Loops Filled";
LCO 3.9.4, "Residual Heat Removal (RHR) and Coolant Circulation – High Water Level" (MODE 6); and
LCO 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation – Low Water Level" (MODE 6).

(continued)

BASES (continued)

ACTIONS

A.1

If only one RHR train is OPERABLE and in operation, redundancy for RHR is lost. Action must be initiated to restore a second train to OPERABLE status. The immediate Completion Time reflects the importance of maintaining the availability of two paths for heat removal.

B.1 and B.2

If no required RHR trains are OPERABLE or in operation, except during conditions permitted by Note 1, all operations involving a reduction of RCS boron concentration must be suspended and action must be initiated immediately to restore an RHR train to OPERABLE status and operation. Boron dilution requires forced circulation for uniform dilution, and the margin to criticality must not be reduced in this type of operation. The immediate Completion Time reflects the importance of maintaining operation for heat removal. The action to restore must continue until one train is restored to OPERABLE status and operation.

SURVEILLANCE REQUIREMENTS

SR 3.4.8.1

This SR requires verification every 12 hours that one train is in operation. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. The Frequency of 12 hours is sufficient considering other indications and alarms available to the operator in the control room to monitor RHR train performance.

SR 3.4.8.2

Verification that the required number of pumps are OPERABLE ensures that additional pumps can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pumps. The Frequency of 7 days is considered reasonable in view of

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.8.2 (continued)

other administrative controls available and has been shown to be acceptable by operating experience.

REFERENCES

None.

SUPPLEMENT 4
CONVERSION PACKAGE SECTION 3.7
PAGE INSERTION INSTRUCTIONS

Remove and insert the following pages into Enclosure 15 to Serial: RNP-RA/96-0141

	Remove Page	Insert Page
a.	Part 1, "Markup of Current Technical Specifications (CTS)"	
	NA	
b.	Part 2, "Discussion of Changes (DOCs) for CTS Markup"	
	NA	
c.	Part 3, "No Significant Hazards consideration (NSHC), And Basis for Categorical Exclusion from 10 CFR 51.22	
	NA	
d.	Part 4, "Markup of NUREG-4131, Revision 1, Standard Technical Specifications-Westinghouse Plants, (ISTS)"	
	3.7-31	3.7-31
e.	Part 5, "Justification of Differences (JFDs) to ISTS"	
	4	4
f.	Part 6, "Markup of ISTS Bases"	
	B 3.7-69	B 3.7-69
g.	Part 7, "Justification of Differences (JFDs) to ISTS Bases"	
	6	6
h.	Part 8, "Proposed HBRSEP, Unit No. 2 ITS"	
	3.7-27	3.7-27
i.	Pat 9, "Proposed Bases to HBRSEP, Unit No.2 ITS Bases"	
	B 3.7-64, B 3.7-65	B 3.7-64, B 3.7-65
j.	Part 10, "ISTS Generic Changes"	
	NA	

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
[3.8.2.e] D. Two FBACS trains inoperable during movement of irradiated fuel assemblies in the fuel building.	D.1 Suspend movement of irradiated fuel assemblies in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
[M33] SR 3.7.13.1	Operate each FBACS train for ≥ 10 continuous hours with the heaters operating or (for systems without heaters) ≥ 15 minutes.	31 days
[M33] SR 3.7.13.2	Perform required FBACS filter testing in accordance with the [Ventilation Filter Testing Program (VFTP)].	In accordance with the [VFTP]
[SR 3.7.13.3	Verify each FBACS train actuates on an actual or simulated actuation signal.	[18] months]
[M33] SR 3.7.13.4	Verify one FBACS train can maintain a pressure ≤ [-0.125] inches water gauge with respect to atmospheric pressure during the [post accident] mode of operation at a flow rate ≤ [20,000] cfm.	[18] months on a STAGGERED TEST BASIS

(continued)

26 ITS 3.7.13 Applicability is modified to require boron concentration to meet requirements during new and spent fuel movement activities in the fuel storage pool, consistent with current licensing basis. This ensures that K_{eff} remains within the analyses when fuel movement activity is taking place and takes credit for the dual verification that occurs during movement of new or spent fuel in the fuel storage pool. The Required Action when the LCO is not met is to suspend movement of fuel assemblies in the fuel storage pool, which places the Specification in a mode in which it is no longer Applicable, and therefore Required Action A.2.1 is unnecessary. The provision in the ISTS to limit Applicability of the LCO to only those times when verification has not been performed following the last movement of fuel assemblies does not apply, nor does Required Action A.2.2.

27 ITS Specification 3.7.14 is modified to reflect the current new and spent fuel storage requirements. Since specific design requirements are applied to the storage of new fuel to prevent maximum new fuel packing that would result in new fuel storage outside the assumptions of the new fuel storage criticality analysis, ISTS 3.7.14 was modified to include new fuel storage in addition to spent fuel storage in order to provide a Required Action and a Surveillance Requirement to the storage of new fuel. Additionally, since the spent fuel storage criticality analysis is not dependent on fuel burnup, the ISTS format for the LCO and referenced figure is not adopted in ITS. The only limitations on spent fuel storage are fuel assembly configuration restrictions provided in Updated Final Safety Analysis Report (UFSAR) Table 9.1.2-2, that apply to locations in either the high or low density spent fuel storage racks. The details of fuel assembly configurations and locations are appropriately controlled as currently included in the UFSAR. Therefore, the resulting ITS LCO 3.7.14 is written to provide an LCO requirement to store new and spent fuel in approved locations, and provide the necessary required action and surveillance requirement.

28 ITS SR 3.7.4.5 is modified by a Note that allows entry into and operation in MODE 3 and MODE 2 prior to performing the SR for the steam driven AFW pump. This is necessary because sufficient decay heat is not available following an extended outage. The unit must be at a point of adding minimum core heat in order to provide sufficient steam to operate the steam driven AFW pump to verify water flow.

29 ISTS 3.7.13.1 requires (for plants with heaters) each FBACS train to be operated for ≥ 10 continuous hours with heaters operating. The wording of ISTS 3.7.13.1 is revised in ITS 3.7.11.1 to require the FBACS to be operated for ≥ 10 continuous hours with the heaters operating automatically. This change is necessary to reflect the HBRSEP Unit No. 2 design of the Fuel Building Air Cleanup System (the system consists of a single train) and the fact that the heaters cycle on and off automatically to control humidity.

BASES

ACTIONS

C.1 and C.2 (continued)

that no undetected failures preventing system operation will occur, and that any active failure will be readily detected.

If the system is not placed in operation, this action requires suspension of fuel movement, which precludes a fuel handling accident. This does not preclude the movement of fuel assemblies to a safe position.

D.1

When two trains of the FBACS are inoperable during movement of irradiated fuel assemblies in the fuel building, action must be taken to place the unit in a condition in which the LCO does not apply. Action must be taken immediately to suspend movement of irradiated fuel assemblies in the fuel building. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.7.13.1

Standby systems should be checked periodically to ensure that they function properly. As the environmental and normal operating conditions on this system are not severe, testing each train once every month provides an adequate check on this system.

Monthly heater operation dries out any moisture accumulated in the charcoal from humidity in the ambient air. [Systems with heaters must be operated for ≥ 10 continuous hours with the heaters energized. Systems without heaters need only be operated for ≥ 15 minutes to demonstrate the function of the system.] The 31 day Frequency is based on the known reliability of the equipment and the two train redundancy available.

SR 3.7.13.2

This SR verifies that the required FBACS testing is performed in accordance with the [Ventilation Filter Testing

(continued)

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47 The CREFS design basis does not include heating units.

48 CREFS filter testing program is described in ITS Section 5.5.11, "Ventilation Filter Testing Program (VFTP)." The program includes a commitment to Regulatory Guide 1.52, Revision 2, March 1978, Positions C.5 and C.6 only.

49 Bases 3.7.9 are modified to provide additional support the Frequency for performance of SR 3.7.9.3, and to be consistent with other ISTS Surveillances.

50 Bases 3.7.10 are modified to reflect the design basis and configuration. Descriptive information for the control room water cooled condensing units (WCCUs) is provided. Specifically, the control room air conditioning heat removal equipment consists of two independent trains of refrigeration equipment, with the exception of the shared SWS supply to the WCCU subsystem. Each train is sized to remove the design heat load from the control room while maintaining the control room temperature between 70°F and 77°F, (i.e., below the design limit of 85°F). One WCCU is maintained in continuous operation while the other unit is maintained in a standby auto start status. The standby unit will autostart upon a trip of the operating WCCU.

51 Bases 3.7.10 Action E is modified to reflect a 48 hour allowed outage time for the inoperability of two WCCU trains and Action F is adopted to place the plant in a MODE where the LCO is not applicable if the 48 hour AOT can not me met. These changes are consistent with current licensing basis.

52 The Bases are revised to reflect changes made to the Specification.

53 ISTS 3.7.12 is not adopted in the ITS. The ECCS Pump Room Exhaust Air Cleanup System provides no safety function, and therefore no Technical Specifications are required.

54 Bases 3.7.11 are modified to reflect that the Fuel Building Air Cleanup System (FBACS) is a manually actuated, single train system that is required to be operating during movement of irradiated fuel assemblies in the building. The FBACS has no safety function in the mitigation of the consequences of reactor accidents. The FBACS safety function is to mitigate the consequences of a fuel handling accident in the Fuel Building.

55 Bases 3.7.11 for the FBACS Applicable Safety Analyses are modified to be consistent with plant design criteria and the accident analyses provided in UFSAR Section 15.7.4.

3.7 PLANT SYSTEMS

3.7.11 Fuel Building Air Cleanup System (FBACS)

LCO 3.7.11 The FBACS shall be OPERABLE and operating.

APPLICABILITY: During movement of irradiated fuel assemblies in the fuel building.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The FBACS inoperable during movement of irradiated fuel assemblies in the fuel building.	A.1 Suspend movement of irradiated fuel assemblies in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Operate the FBACS for ≥ 10 continuous hours with the heaters operating automatically.	31 days
SR 3.7.11.2	Perform required FBACS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.11.3	Verify the FBACS can maintain a negative pressure with respect to atmospheric pressure.	18 months

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

The FBACS should be checked periodically to ensure that it functions properly. As the environmental and normal operating conditions on this system are not severe, testing once every month provides an adequate check on this system.

Monthly heater operation dries out any moisture accumulated in the charcoal from humidity in the ambient air. Systems with heaters must be operated for ≥ 10 continuous hours with the heaters operating in the automatic mode under humidistat control to maintain the relative humidity at the inlet of the charcoal bed ≤ 70%. The 31 day Frequency is based on the known reliability of the equipment.

SR 3.7.11.2

This SR verifies that the required FBACS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.11.3

This SR verifies the integrity of the fuel building enclosure. The ability of the fuel building to maintain negative pressure with respect to potentially uncontaminated adjacent areas is periodically tested to verify proper function of the FBACS. The FBACS is designed to maintain a slight negative pressure in the fuel building, to prevent unfiltered LEAKAGE. The Frequency of 18 months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. 5).

REFERENCES

1. UFSAR, Section 6.5.1.

2. UFSAR, Section 9.4.5.

(continued)

BASES

REFERENCES (continued)	3.	UFSAR, Section 15.7.4.
	4.	10 CFR 100.
	5.	NUREG-0800, Section 6.5.1, Rev. 2, July 1981.

SUPPLEMENT 4
CONVERSION PACKAGE SECTION 3.8
PAGE INSERTION INSTRUCTIONS

Remove and insert the following pages into Enclosure 16 to Serial : RNP0RA/960141

	Remove Page	Insert Page
a.	Part 1, "Markup of Current Technical Specifications (CTS)"	
	4.6-1, 3.7-1, 4.1-12, 4.6-2, 3.7-2, 4.1-14	4.6-1, 3.7-1, 4.1-12, 4.6-2, 3.7-2, 4.1-14
b.	Part 2, "Discussion of Changes (Docks) for CTS Markup"	
	1 through 18	1 through 27
	Including 10a through 10h	-
c.	Part 3, "No Significant Hazards Consideration (NSHC), and Basis for Categorical"	
	13	13, 14 & 15
d.	Part 4, "Markup of NUREG-4131, Revision 1, Standard Technical Specifications-Westinghouse Plants, (ISTS)"	
	3.8-9, 3.8-10, 3.8-11, 3.8-12	3.8-9, 3.8-10, 3.8-11, 3.8-12
	3.8-13, 3.8-15, 3.8-16	3.8-13, 3.8-15, 3.8-16
	Insert 3.8.1-9 (no page number)	3.8-16a
	3.8-18, 3.8-19, 3.8-20, 3.8-22, 3.8-26	3.8-18, 3.8-19, 3.8-20, 3.8-22, 3.8-26
	3.8-28, 3.8-29, 3.8-35, 3.8-36, 3.8-37, 3.8-39	3.8-28, 3.8-29, 3.8-35, 3.8-36, 3.8-37, 3.8-39
	Insert 3.8.9-2 (no page number)	3.8-39a
	3.8-40, 3.8-41	3.8-40, 3.8-41
e.	Part 5, Justification of Differences (JFDs) to ISTS"	
	1 through 6	1 through 8
f.	Part 6, "Markup of ISTS Bases"	
	B 3.8-1	B 3.8-1
	Insert B 3.8.1-1 (no page number)	B 3.8-1a
	B 3.8-2, 3.8-4	B 3.8-2, 3.8-4
	-	B 3.8-4a
	B 3.8-5	B 3.8-5
	-	B 3.8-5a
	Insert B 3.8.1-4 (no page number)	B 3.8.1-7a
	B 3.8-20, B 3.8-21, B 3.8-22, B 3.8-23	B 3.8-20, B 3.8-21, B 3.8-22, B 3.8-23
	B 3.8-24, B 3.8-25	B 3.8-24, B 3.8-25
	Insert B 3.8.1-6 (no page number)	B 3.8-25a
	B 3.8-26, B 3.8-27, B 3.8-28	B 3.8-26, B 3.8-27, B 3.8-28
	Insert B 3.8.1-8 (no page number)	B 3.8-28a
	B 3.8-30, B 3.8-31, B 3.8-32	B 3.8-30, B 3.8-31, B 3.8-32
	Insert B 3.8.1-9 (no page number)	B 3.8-32a

SUPPLEMENT 4
CONVERSION PACKAGE SECTION 3.8
PAGE INSERTION INSTRUCTIONS

Remove and insert the following pages into Enclosure 16 to Serial : RNP0RA/960141

	Remove Page	Insert Page
f.	Part 6, "Markup of ISTS Bases"	
	B 3.8-34, B 3.8-35, B 3.8-36, B 3.8-37	B 3.8-34, B 3.8-35, B 3.8-36, B 3.8-37
	B 3.8-38, B 3.8-39, B 3.8-40, B 3.8-41	B 3.8-38, B 3.8-39, B 3.8-40, B 3.8-41
	B 3.8-44, B 3.8-45, B 3.8-46	B 3.8-44, B 3.8-45, B 3.8-46
	-	B 3.8-46a
	B 3.8-49, B 3.8-50, B 3.8-56, B 3.8-60	B 3.8-49, B 3.8-50, B 3.8-56, B 3.8-60
	B 3.8-61	B 3.8-61
	B 3.8-62, B 3.8-63, B 3.8-66, B 3.8-67	B 3.8-62, B 3.8-63, B 3.8-66, B 3.8-67
	-	B 3.8-74a
	B 3.8-75, B 3.8-76, B 3.8-77	B 3.8-75, B 3.8-76, B 3.8-77
	-	B 3.8-77a
	B 3.8-78	B 3.8-78
	Insert B 3.8.9-4 (no page number)	B 3.8-80a
	Insert B 3.8.9-5 (no page number)	B 3.8-81a
	B 3.8-87	B 3.8-87
	-	B 3.8-87a
	-	B 8.8-88a
	B 3.8-89, B 3.8-90, B 3.8-91, B 3.8-92	B 3.8-89, B 3.8-90, B 3.8-91, B 3.8-92
g.	Part 7, "Justification for Differences (JFDs) to ISTS Bases"	
	1 through 4	1 through 5
h.	Part 8, "Proposed HBRSEP, Unit No 2 ITS"	
	3.8-1 through 3.8-15	3.8-1 through 3.8-15
	3.8-17, 3.8-18, 3.8-20, 3.8-22, 3.8-23	3.8-17, 3.8-18, 3.8-20, 3.8-22, 3.8-23
	3.8-29, 3.8-30, 3.8-31, 3.8-34, 3.8-35	3.8-29, 3.8-30, 3.8-31, 3.8-34, 3.8-35
	3.8-36	3.8-36
i.	Part 9, "Proposed Bases to HBRSEP, Unit No. 2 ITS Bases"	
	B 3.8-1 through B 3.8-78	B 3.8-1 through B 3.8-78
	-	B 3.8-79, B 3.8-80, B 3.8-81
j.	Part 10, "ISTS Generic Changes"	
	NA	

ITS

Specification 3.8.1

(A1)

4.6 EMERGENCY POWER SYSTEM PERIODIC TESTS

Applicability

Applies to periodic testing and surveillance requirements of the emergency power system.

Objective

To verify that the emergency power system will respond promptly and properly when required.

Specification

The following tests and surveillance shall be performed as stated: (M25)

4.6.1 Diesel Generators

[from standby conditions and achieves steady state voltage ≥ 467V and ≤ 493V and frequency ≥ 58.8Hz and ≤ 61.2Hz]

[SR 3.8.1.2] [SR 3.8.1.3] 4.6.1.1 On a monthly basis, [Verify] each diesel generator ~~shall be tested by manually initiated~~ start, followed by manual synchronization with other power sources, and verification that each diesel generator is loaded and operates for ≥ 60 minutes at a load ≥ 2350 kW and ≤ 2500 kW.

[an actual or] (A7)

[SR 3.8.1.14] 4.6.1.2 Automatic start of each diesel generator, load shedding and restoration to operation of particular vital equipment, initiated by a simulated loss of all normal A-C station service power supplies together with a ~~simulated~~ safety injection signal. This test will be conducted ~~at each refueling interval~~, to assure that the diesel generator will start and assume required load within 50 seconds after the initial starting signal. (18 Months) (M5) (Insert 3.8.1-1)

[SR 3.8.1.10] 4.6.1.3 Each diesel generator shall be inspected at each refueling. The diesel protective bypasses listed in Specification 3.7.1.d shall be demonstrated to be operable by simulating a trip signal to each of the trip devices that is bypassed and observing that the diesel does not receive a trip signal. (LA4) (Verify) (LA1) (LA3) [automatic trips are] (d) [except engine overspeed] (M19)

4.6.1.4 The following diesel generator load limits shall be observed: (LA5)

a. The continuous load rating for the diesel generator is 2500 kW. Continuous operation above this limit shall not be permitted, except as defined within Technical Specification 4.6.1.4.b.

b. The short-term, overload rating of the diesel generator is 2750 kW. Operation at this load shall not exceed 2 hours in any 24 hour period. Operation above the short-term, overload rating shall not be permitted.

Add SR 3.8.1.1
SR 3.8.1.4
SR 3.8.1.5
SR 3.8.1.6
SR 3.8.1.7
SR 3.8.1.8
SR 3.8.1.9
SR 3.8.1.10
SR 3.8.1.13
SR 3.8.1.14

Add SR 3.8.1.2, Notes 1, 2
SR 3.8.1.3, Notes 1, 2, 3, 4
SR 3.8.1.14, Notes 1, 2 (A8)

Add SR 3.8.1.16
SR 3.8.1.17 (M6)

Specification 3.8.3

(A1)

ITS

3.7 AUXILIARY ELECTRICAL SYSTEMS

Applicability

Applies to the availability of electrical power for the operation of plant auxiliaries.

Objective

To define those conditions of electrical power availability necessary (1) to provide for safe reactor operation, and (2) to provide for the continuing availability of engineered safeguards.

Specification

MODES 1, 2, 3 + 4 ← (M1)

[Applicability] 3.7.1 The reactor shall not be made critical without: — see 3.8.1

a) The 110 KV-4160 Volt start-up transformer in service; — See 3.8.9

b) 480-Volt buses E1 and E2 energized; — see 3.8.1

c) 4160-Volt buses 2 and 3 energized;

d) Two diesel generators OPERABLE with a minimum supply of 19,000 gallons of fuel oil available to the diesel generators from the Unit 2 diesel generator fuel oil storage tank and an additional 15,000 gallons available to the diesel generators from either the Unit 1 I-C turbine fuel oil storage tanks or a combination of the Unit 1 I-C turbine fuel oil storage tanks and the Unit 2 diesel generator fuel oil storage tank and with the following protective trips for each diesel generator bypassed:

[SR 3.8.3.1] The stored diesel — starting air subsystem shall be within limits for each DG. ← (M1) — (A9)

1) Low lube oil pressure
2) Low coolant pressure
3) High coolant temperature
4) High crankcase pressure
5) Start failure - Governor Shutdown

— see 3.8.1

Add Actions Note ← (A10)

Add RA A.1, RA B.1 ← (L2)

Add RA C.1 — (M2B)

Add RA D.1 ← (M8)

Add RA E.1 — (A11)

Specification 3.8.3

A1

TABLE 4.1-3

FREQUENCIES FOR EQUIPMENT TESTS

ITS

		Check	Frequency	Maximum Time Between Tests
1.	Control Rods	Rod drop times of all full length rods	Each refueling shutdown	NA*
2.	Control Rod	Partial movement of all full length rods	Every 2 weeks during reactor critical operations	20 days
3.	Pressurizer Safety Valves	Set point	Each refueling shutdown	NA
4.	Main Steam Safety Valves	Verify each required MSSV lift setpoint per Table 4.1-4 in accordance with the Inservice Testing Program. Following testing, lift setting shall be within +/- 1%.	In accordance with the Inservice Testing Program	NA
5.	Containment Isolation Trip	Functioning	Each refueling shutdown	NA
6.	Refueling System Interlocks	Functioning	Prior to each refueling shutdown	NA
7.	Service Water System	Functioning	Each refueling shutdown	NA
8.	DELETED			
9.	Primary System Leakage	Evaluate	Daily when reactor coolant system is above cold shutdown condition	NA
10.	Diesel Fuel Supply	Fuel Inventory	Weekly 7 days	10 days
11.	DELETED			
12.	Turbine Steam Stop, Control, Reheat Stop, and Interceptor Valves	Closure	Quarterly during power operation and prior to startup	115 days

See 3.1.4

See 3.4.10

See 3.7.1

See 3.3.2 3.6.3

See 3.9.1

See 3.7.7

See 3.4.13

See 3.7.1

[SR 3.8.3.1]

Verify a minimum supply of 19,000 gallons of diesel fuel oil available to the DGs from the Unit 2 fuel oil storage tank AND a total of 34,000 gallons available to the DGs from the combination of the Unit 1 I-C Turbine fuel oil storage tanks and the Unit 2 DG fuel oil storage tank

Supplement 4

Specification 3.8.6 (A1)

ITS

4.6.1.5 At each refueling interval, each diesel generator shall be tested by manually initiated start, followed by manual synchronization with other power sources, and verification that each diesel generator is loaded and operates for ≥ 24 hours. During two hours of this test, the load shall be maintained between 2650 kW and 2750 kW*. During the remaining 22 hours of this test, the load shall be maintained between 2400 kW and 2500 kW*. The power factor shall be maintained between 0.8 and 0.9 during the entire test. (See 3.8.1)

4.6.2 Diesel Fuel Tanks

A minimum fuel oil inventory sufficient to ensure 19,000 gallons available to the diesel generators shall be maintained at all times in the Unit 2 diesel generator fuel oil storage tank and an additional 15,000 gallons available to the diesel generators shall be maintained at all times in either the Unit 1 I-C turbine fuel oil storage tanks or a combination of the Unit 1 I-C turbine fuel oil storage tanks and the Unit 2 diesel generator fuel oil storage tank. (See 3.8.3)

4.6.3 Station Batteries — Verify battery cell parameters meet Table 3.8.6-1 Category A Limits (M26)

[SR 3.8.6.1] 4.6.3.1 The voltage and temperature of a pilot cell in each battery shall be measured and recorded daily (5 days/week). — 7 days (L6)

[SR 3.8.6.1] [SR 3.8.6.2] 4.6.3.2 The specific gravity and voltage to the nearest 0.01 volt, the temperature reading of every fifth cell, the height of electrolyte and the amount of water added to each cell shall be measured and recorded monthly. (LA7) — 7 days for SR 3.8.6.1 (M26); 92 days for SR 3.8.6.2 (L11)

4.6.3.3 Each battery shall be subjected to an equalizing charge annually. The requirements in 4.6.3.2 above shall be performed after each equalizing charge. (L7)

4.6.3.4 At each time data is recorded, new data shall be compared with old to detect signs of abuse or deterioration. (LA7)

* The minimum and maximum kW values are included as guidance to avoid overloading of the engine. Loads in excess of this range for special testing under direct monitoring of the manufacturer or momentary variations due to changing bus loads shall not invalidate this test. (See 3.8.1)

Add LCO Applicability (M15)

Add 2nd + 3rd Freq for SR 3.8.6.2 (M15)

Add SR 3.8.6.3 (L10) (M29)

Add RA A.1, A.2, A.3 (L3)

PAGE 4.6-2a HAS BEEN DELETED

Add RA B.1 (A22)

Supplement 4

ITS

Specification 3.8.9

A1

M27

TRAIN A and TRAIN B AC

and AC Instrument Bus electrical power

A17

[LCO 3.8.9]

e) ~~Station batteries A and B, a battery charger A or A-1 and B or B-1 on each battery and their~~ DC distribution systems ~~are~~ operable.

Shall be

~~3.7.2 During power operation the following components may be inoperable:~~

a) Provided both diesel generators are operable, power operation may continue with the start-up transformer out of service for 24 hours without reporting to the NRC.

b) Power operation may continue with the start-up transformer out of service beyond 24 hours provided both diesel generators are operable and the reporting requirements of Specification 6.6.1 are followed.

c) Power operation may continue if the start-up transformer and one diesel generator is inoperable provided the reporting requirements of Specification 6.6.1 and 6.6.2 are followed.

d) ------------------------------NOTES------------------------------

1. For the purpose of operability testing, the diesel generator start may be preceded by an engine pre-lube period and followed by a warmup period. The diesel generator is not required to be loaded. The diesel generator shall achieve steady state voltage and frequency during the test.

2. The diesel generator may be inoperable for a total of two hours per test inclusive of the 24 hours allowed time in 2) or 3) below.

With either diesel generator inoperable, restore inoperable diesel generator to service within 7 days and perform 1) AND EITHER 2) OR 3) below:

1) Verify the availability of the required off-site power source within one hour and once per twelve hours thereafter.

AND

2) Determine that the remaining operable diesel generator is not inoperable due to common cause failure within 24 hours; AND if the inoperable diesel generator is not restored prior to 72 hours, verify the remaining operable diesel generator starts within the next 24 hours.

OR

3) Verify the remaining operable diesel generator starts within 24 hours.

See 3.8.1

Add RA A.1 ← L5

Add RA F.1, RA F.2 ← M20, A23

Add RA B.1, RA C.1 ← M20, A23

Add RA G.1 ← A19

Add RA D.1, RA E.1 ← A18

Supplement 4

ITS

A1

TABLE 4.1-3 (Continued)
FREQUENCIES FOR EQUIPMENT TESTS

	Check	Frequency	Maximum Time Between Test
		2. Whenever integrity of a pressure isolation valve listed in Table 3.1-1 cannot be demonstrated, the integrity of the remaining valve in each high pressure line having a leaking valve shall be determined and recorded daily. In addition, the position of the other closed valve located in the high pressure piping shall be recorded daily.	See 3.4
18. Automatic Bus Transfers [SR 3.8.9.2] a) Auxiliary Feedwater Header Discharge Valve to Steam Generator A, V2-16A [SR 3.8.9.3] b) Turbine Building, Cooling Water Isolation Valve, V6-16C	~~Test thermal and magnetic trip elements of respective molded case circuit breakers~~ Verify capability of the two molded case circuit breakers to trip on overcurrent (L9)	~~Each refueling shutdown~~ 18 Months	~~NA~~

Add SR 3.8.9.1 (M22)

ADMINISTRATIVE CHANGES

A1 In the conversion of the H.B. Robinson Steam Electric Plant (HBRSEP), Unit No.2 Current Technical Specification (CTS) to the proposed plant specific Improved Technical Specifications (ITS) certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make ITS consistent with the conventions in the - Standard Technical Specifications, Westinghouse Plants NUREG-1431, Rev 1 (i.e., Improved Standard Technical Specifications (ISTS)).

A2 Not Used.

A3 CTS 3.7.1.d requires two diesel generators be OPERABLE. ITS includes the additional phrase ". . . capable of supplying the onsite power distribution system. The requirements of the additional phrase are consistent with the definition of OPERABLE. Therefore, this is an administrative change and is consistent with ISTS.

A4 CTS 3.7.2.d, Note 1 permits diesel engine pre-lube followed by a warmup period. The prepositional phrase at the beginning of the note is not explicitly retained. This phrase serves to limit the allowance to DG operability testing. ITS SR 3.8.1.2 includes the specified allowance for pre-lube and warmup. Since performance of this SR is operability testing, specific retention of the involved phrase is unnecessary.

The last two sentences to this note are not explicitly retained. The sentence serves to define the required testing. DG loading is not required while attainment of steady-state voltage and frequency is required. SR 3.8.1.2 is the comparable ITS requirement. This SR does not require DG loading and explicitly requires achieving a steady state voltage and frequency.

CTS 4.6.1.1 requires monthly testing of the DG. Although this specification does not explicitly require achievement of steady state voltage and frequency, the requirements are contained within CTS 3.7.2.e, Note 1. SR 3.8.1.2 is the comparable ITS requirement. This SR explicitly requires achieving a steady state voltage and frequency. Therefore, these are administrative changes and are consistent with ISTS.

A5 Not used.

A6 The CTS bases are not retained in the ITS, but are replaced in their entirety. The ITS includes significantly expanded and improved bases.

The bases do not define or impose any specific requirements but serve to explain, clarify and document the reasons (i.e., bases) for the associated specification. The bases are not part of the Technical Specifications required by 10 CFR 50.36. Therefore, this is an administrative change and is consistent with ISTS.

A7 CTS 4.6.1.2 specifies DG testing initiated by a simulated loss of all station AC power supplies together with a simulated SI signal. ITS SR 3.8.1.15 permits an actual event and therefore an actual signal to satisfy the SR requirements. The results of the testing are not affected by the nature of the initiating signal since the system cannot discriminate whether the signals are actual or simulated. Therefore, this is an administrative change and is consistent with ISTS.

A8 CTS notes comparable to SR 3.8.1.2, Note 1 and 3; SR 3.8.1.3, Notes 1 through 4; SR 3.8.1.12 Note 2 and SR 3.8.1.15, Notes 1 and 2 do not exist.

SR 3.8.1.2, Note 1 specifies that performance of SR 3.8.1.7 satisfies the requirements of SR 3.8.1.2. The performance of any SR which satisfies the requirements of another SR is always acceptable. SR 3.8.1.2, Note 3 permits use of modified start procedures recommended by the DG manufacturer for this surveillance. CTS 4.6.1.1 which is the comparable CTS requirement does not preclude the use of modified start procedures.

SR 3.8.1.3, Note 1 permits gradual loading of a DG as recommended by the DG manufacturer. CTS 4.6.1.1 which is the comparable CTS requirement does not preclude the use of gradual loading procedures. SR 3.8.1.3, Note 2 states that momentary transients outside the load range do not invalidate the test. CTS 4.6.1.1 which is the comparable CTS requirement is silent regarding momentary transients, but it a reasonable conclusion that such momentary transients outside the load range are not indicative of a DG operability concern and are within the realm of engineering judgement with respect to the impact on test results. SR 3.8.1.3, Note 3 specifies that the SR be performed on one DG at a time. Performance of this SR results in inoperability of the DG being tested. Consequently, concurrent performance of this SR on both DGs is not permitted by the CTS since this is not an allowable condition. SR 3.8.1.3, Note 4 requires that this SR be preceded by and immediately follow without shutdown a successful performance of SR 3.8.1.1 or SR 3.8.1.7. Although a CTS requirement comparable to SR 3.8.1.7 does not exist, the interrelationship between SR 3.8.1.2 and SR 3.8.1.3 is consistent with comparable CTS requirements specified in 4.6.1.1.

SR 3.8.1.12, Note 2 specifies that the test shall not be performed in MODES 1 or 2 and that credit may be taken for unplanned events to satisfy the SR. CTS 4.6.1.5 which is the comparable CTS requirement requires the test be performed at refueling intervals, while the performance of the test itself precludes performance during operation with the reactor critical due to its impact on equipment required to be OPERABLE. The CTS does not preclude taking credit for an actual event which satisfies the test requirements.

SR 3.8.1.15, Note 1 specifies that the DG start may be preceded by a pre-lube. CTS 4.6.1.2 which is the comparable CTS requirement does not preclude a pre-lube. SR 3.8.1.15, Note 2 specifies that the test shall not be performed in MODES 1, 2, 3 or 4 and that credit may be taken for unplanned events to satisfy the SR. CTS 4.6.1.2 which is the comparable CTS requirement requires the test be performed at refueling intervals, while the performance of the test itself precludes performance during conditions other than cold shutdown due to its impact on associated equipment otherwise required to be OPERABLE. The CTS does not preclude taking credit for an actual event which satisfies the test requirements.

Therefore, these are administrative changes and are consistent with ISTS.

A9 Some CTS specifications provide a greater level of detail than that consistent with the format and content of the ITS. A portion of these items involve including parametric values in LCO type specifications in the CTS. For these items the parametric values are retained in ITS SRs. Other items include listings of components, features, attributes, etc. associated with OPERABILITY of CTS equipment. The ITS does not retain the specific listings since they are generically encompassed within the definition of OPERABLE specified in ITS Section 1.1, Definitions. Therefore, this is an administrative change and is consistent with ISTS.

A10 CTS does not contain a note comparable to ITS 3.8.3, Actions Note. This note permits separate condition entry for each DG. The CTS requirements for DG fuel oil involve the fuel oil storage tanks common to both DGs. Therefore application of the requirements involves both DGs. Therefore, this is an administrative change and is consistent with ISTS.

A11 If the DG fuel oil is not within limits or if the DG air subsystem is inoperable, the CTS does not provide specific actions. Consistent with the definition of OPERABLE, the associated DGs are required to be declared inoperable. There are no other CTS requirements for these conditions. In these conditions, ITS 3.8.3 Required Action (RA) E.1 requires declaring the associated DGs inoperable. Therefore, these are administrative changes and are consistent with ISTS.

A12 CTS 4.6.2 provides requirements for stored DG fuel oil. Since these requirements duplicate the requirement specified in CTS 3.7.1.d, they are not separately retained in the ITS. The parameters specified are contained in ITS SR 3.8.3.1. Therefore, this is an administrative change and is consistent with ISTS.

A13 CTS 3.7.2.f, g and h collectively provide required actions and completion times for one inoperable battery and one or more associated battery chargers. These are the components which make up the DC electrical power subsystem. ITS 3.8.3 RA A.1, B.1 and B.2 provide Required Actions with associated Completion Times for one inoperable DC Power subsystem. Therefore, these are administrative changes and are consistent with ISTS.

A14 A note comparable to the second part of Note 2 for ITS SR 3.8.4.5 does not exist. This portion of the note permits credit to be taken for unplanned events. CTS does not preclude taking credit for such events. Therefore, this is an administrative change and is consistent with ISTS.

A15 CTS 4.6.3.5 permits the battery load test performed at the 5 year frequency to be substituted for the 18 month service test. The explicit provision for substitution at the 5 year interval is not retained in the ITS. The CTS does not preclude substitution at other times. The requirements for the battery load test are more severe and generally bound the requirement for the service test. Hence successful performance of the battery load test satisfies the requirements for the battery service test. Therefore, this is an administrative change and is consistent with ISTS.

A16 A note comparable to the Note for ITS SR 3.8.4.6 does not exist. This note precludes performance of the SR in MODES 1, 2, 3 and 4 and permits credit to be taken for unplanned events. CTS does not permit performing the test in a condition other that cold shutdown, since the test and the subsequent recharging time requires the battery to be inoperable for a time greater than permitted by CTS 3.7.2.f. CTS does not preclude taking credit for such events. Therefore, this is an administrative change and is consistent with ISTS.

A17 Explicit requirements in the CTS for the AC instrument power distribution system do not exist, however its operability is implicitly required by the definition of OPERABLE and CTS requirements for systems and components powered from this distribution system. ITS LCO 3.8.9 requires the Train A and Train B AC instrument power distribution subsystems be OPERABLE. Therefore, these are administrative changes and are consistent with ISTS.

A18 With one or both of the thermal or magnetic trip elements inoperable for both of the molded case circuit breakers associated with either the AFW Header Discharge to S/G "A" valve, V12-16A or the Service Water Turbine Building Supply Valve (emergency supply), V6-16C, CTS does not provide any specific actions. In this condition the actions are specified by 3.0. CTS 3.0 requires the unit be placed in hot shutdown within 8 hours and cold shutdown within an additional 30 hours. ITS 3.8.9 RA D.1 and E.1 permit up to two hours to open the associated circuit breakers with the inoperable trip elements. The Completion Time of two hours is reasonable to complete the specified Required Action. With Required Actions and associated Completion Times not met, ITS 3.8.9 RA F.1 and F.2 requires the unit be placed in MODE 3 within 6 hours and MODE 5 within 36 hours. Neither RA E.1 or RAs F.1 and F.2 specify when the shutdown must begin. Provided the unit is in MODE 3 within 8 hours and MODE 5 within 38 hours, the ITS requirements are met. With one or both of the trip elements inoperable for both of the molded case circuit breakers associated with either the AFW Header Discharge to S/G "A" valve, V12-16A or the Service Water Turbine Building Supply Valve (emergency supply), V6-16C, both CTS and ITS require achieving hot shutdown within eight hours and cold shutdown within 38 hours. Therefore, this change is administrative changes and is consistent with ISTS.

A19 Explicit CTS requirements comparable to ITS 3.8.9 RA G.1 do not exist. With two trains of the AC, DC or AC instrumentation power electrical inoperable which result in a loss of safety function, the CTS actions are governed by 3.0. For this condition, ITS 3.8.9 RA G.1 requires immediate entry into LCO 3.0.3. CTS 3.0 and ITS 3.0.3 are comparable specification, although ITS 3.0.3 is more restrictive. The difference between CTS 3.0 and ITS LCO 3.0.3 is evaluated elsewhere. Therefore, this change is an administrative change and is consistent with ISTS.

A20 CTS 4.6.1.5 requires the DG load be maintained between 2400 kW and 2500 kW for 22 hours and between 2650 kW and 2750 kW. Additionally, CTS 4.6.1.5 states the power factor shall remain between 0.8 and 0.9 during the entire test. A CTS footnote to the surveillance states that momentary variations due to changing bus loads do not invalidate the test. ITS SR 3.8.1.12 requires similar testing of the DGs. Note 1 to SR 3.8.1.12 states that momentary transients outside the load and power factor ranges do not invalidate the test. Therefore, this change is administrative changes and is consistent with ISTS.

A21 CTS 4.6.3.5 requires performance of a load test on the batteries. ITS SR 3.8.4.6 requires performance of a performance discharge test on the batteries. Since a performance discharge test is a "load test" of the battery, this change is considered administrative and is consistent with ISTS.

A22 CTS does not provide any allowable time for battery parameters indicating an inoperable Battery. In this situation, CTS requires declaring the associated battery inoperable. ITS RA B requires immediately declaring the associated battery inoperable. Therefore, this change is considered administrative and is consistent with ISTS.

A23 With an inoperable DC or AC instrument bus power electrical distribution subsystem, CTS does not provide any specific actions. In this condition the actions are specified by 3.0. CTS 3.0 requires the unit be placed in hot shutdown within 8 hours and cold shutdown within an additional 30 hours. ITS 3.8.9 RA B.1 and C.1 permits up to two hours to restore the DC and AC instrument bus power electrical distribution subsystem to OPERABLE status. With Required Actions and associated Completion Times not met, ITS 3.8.9 RA F.1 and F.2 requires the unit be placed in MODE 3 within 6 hours and MODE 5 within 36 hours. Neither RA E.1 or RAs F.1 and F.2 specify when the shutdown must begin. Provided the unit is in MODE 3 within 8 hours and MODE 5 within 38 hours, the ITS requirements are met. With an inoperable DC or AC instrument bus power electrical distribution subsystem, both CTS and ITS require achieving hot shutdown within eight hours and cold shutdown within 38 hours. Therefore, these changes are administrative changes and are consistent with ISTS.

TECHNICAL CHANGES - MORE RESTRICTIVE

M1 CTS 3.7.1 and 3.7.2 requires AC power sources to be OPERABLE with the reactor critical and during power operation. These CTS conditions encompass ITS MODES 1 and 2. ITS 3.8.1 requires OPERABILITY of AC power sources in MODES 1, 2, 3 and 4. The AC sources are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

b. Adequate core cooling is provided and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

CTS 3.7.1.d requires DG fuel oil requirements to be met when the reactor is critical. This CTS applicability is comparable to ITS MODES 1 and 2. ITS 3.8.3 requires applicability of the DG fuel oil requirements in MODES 1, 2, 3 and 4. The AC sources (LCO 3.8.1 and LCO 3.8.2) are required to ensure the availability of the required power to shut down the reactor and maintain it in a safe shutdown condition after an AOO or a postulated DBA. Since stored diesel fuel oil supports LCO 3.8.1 and

LCO 3.8.2, stored diesel fuel oil is required to be within limits when the associated DG is required to be OPERABLE. CTS does not contain explicit requirements for the DG air subsystem. ITS 3.8.3 imposes explicit requirements for the DG air subsystem. Since DG starting air supports LCO 3.8.1 and LCO 3.8.2, starting air is required to be within limits when the associated DG is required to be OPERABLE. CTS 3.7.1.e requires station batteries, battery chargers and associated DC distribution system to be operable when the reactor is critical. This CTS applicability is comparable to ITS MODES 1 and 2. ITS 3.8.4 requires applicability of the DC sources requirements in MODES 1, 2, 3 and 4. The DC electrical power sources are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure safe unit operation and to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

b. Adequate core cooling is provided, and containment integrity and other instrument functions are maintained in the event of a postulated DBA. Therefore, these are more restrictive requirements upon unit operation and are consistent with ISTS.

M2 CTS 3.7.2.a permits the offsite circuit to be inoperable for no more than 24 hours without reporting to the NRC provided both diesel generators (DG) are OPERABLE. The specific phrasing requiring the OPERABILITY of both DGs is not retained in the ITS. With one inoperable DG, CTS 3.7.2.c permits the offsite source to be inoperable for up to 24 hours provided the reporting requirements specified in CTS 6.6.1 and CTS 6.6.2 are followed. This provision for two AC sources to be inoperable for up to 24 hours is not retained in ITS. ITS 3.8.1 RA D.1 requires immediate entry in LCO 3.0.3 if two or more AC sources are inoperable. This Condition corresponds to a level of degradation in which all redundancy in the AC electrical power supplies has been lost. At this severely degraded level, any further losses in the AC electrical power system will cause a loss of function. Therefore, no additional time is justified for continued operation. The unit is required by LCO 3.0.3 to commence a controlled shutdown. Therefore this aspect of this change is a more restrictive requirement upon plant operation and is consistent with ISTS.

The specific provisions in CTS 3.7.2 regarding reporting to the NRC in accordance with CTS 6.6.1 and CTS 6.6.2 are not retained in ITS. These reporting requirements invoke the requirements of 10 CFR 50.72 and 50.73. These reporting requirements remain independently applicable. Therefore, this aspect of this change is an administrative change and is consistent with ISTS.

M3 CTS 3.7.2 permits the offsite circuit to be inoperable for up to 24 hours. CTS 3.7.2.d permits one DG to be inoperable for up to 7 days. ITS 3.8.1 RA A.1 and RA B.1 include similar restrictions. Additionally ITS 3.8.1 RA A.1 and RA B.1 require that inoperability of the offsite circuit or DG be limited to 8 days from discovery to meet the LCO. The 8 day Completion Time provides a limit on time allowed in a specified condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. These are more restrictive requirements upon unit operation and are consistent with ISTS.

M4 With required actions and completion times not satisfied, CTS actions are specified by 3.0. CTS 3.0 requires the unit be placed in hot shutdown within 8 hours and cold shutdown within an additional 30 hours. For this condition ITS 3.8.1 RA C.1 and C.2 require the unit be placed in MODE 3 within 6 hours and MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems. Therefore these are more restrictive requirements upon unit operation and are consistent with ISTS.

M5 CTS 4.6.1.2 requires that the test verify the DG starts and assumes required loads within 50 seconds. ITS SR 3.8.1.15 requires the diesel to start and energize load through the load sequencer. The load sequencer completes its sequential loading of the Emergency Bus within 50 seconds. Verification of the timing of the last individual load block is comparable to confirming the overall DG start timing requirements. ITS SR 3.8.1.15 specifies additional test requirements which are not included in the CTS test scope. This Surveillance is necessary to demonstrate the DG operation during a loss of offsite power actuation test signal in conjunction with an ESF actuation signal. Therefore this is a more restrictive requirement upon unit operation and is consistent with ISTS.

M6 CTS requirements comparable to ITS SR 3.8.1.1, SR 3.8.1.4 through SR 3.8.1.9, SR 3.8.1.13, SR 3.8.1.14, SR 3.8.1.16 and SR 3.8.1.17 do not exist. SR 3.8.1.1 ensures proper circuit continuity for the offsite AC electrical power supply to the onsite distribution network and availability of offsite AC electrical power. The breaker alignment verifies that each breaker is in its correct position to ensure that distribution buses and loads are connected to their preferred power source. The 7 day Frequency is adequate since breaker position is not likely to change without the operator being aware of it and because its status is displayed in the control room. SR 3.8.1.4 provides verification that the level of fuel oil in the day tank is at or above the level at which fuel oil is automatically added. The level specified

is 140 gallons, which is approximately equal to 1/2 full, and is selected to ensure adequate fuel oil for a minimum of 35 minutes of DG operation at full load plus 10%. The 31 day Frequency is adequate to assure that a sufficient supply of fuel oil is available, since low level alarms are provided and facility operators would be aware of any large uses of fuel oil during this period. SR 3.8.1.5 requires Removal of water from the fuel oil day tanks once every 31 days. Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the fuel oil day tanks once every 31 days eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. The Surveillance Frequencies are established by Regulatory Guide 1.137. SR 3.8.1.6 demonstrates that each required fuel oil transfer pump operates and transfers fuel oil from the storage tank to its associated day tank. This is required to support continuous operation of standby power sources. This Surveillance provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control systems for automatic fuel transfer systems are OPERABLE. The frequency of 31 days is based on the design of fuel transfer system. The pumps operate automatically in order to maintain an adequate volume of fuel oil in the day tanks during or following DG testing. SR 3.8.1.7 helps to ensure the availability of the standby electrical power supply to mitigate DBAs and transients and to maintain the unit in a safe shutdown condition. SR 3.8.1.8 demonstrates the capability of the DGs to operate properly after a loss of the single largest load. SR 3.8.1.9 demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time. SR 3.8.1.10 demonstrates that the DG automatically starts and achieves the required voltage and frequency within the specified time (10 seconds) from the design basis actuation signal (LOCA signal) and operates for ≥ 5 minutes. The 5 minute period provides sufficient time to demonstrate stability. SR 3.8.1.13 demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve the required voltage and frequency within 10 seconds. The 18 month Frequency is based on engineering judgement and is intended to be consistent with expected fuel cycle lengths. SR 3.8.1.14 requires verifying the interval between each sequenced load block. Under accident and loss of offsite power conditions, loads are sequentially

connected to the bus by the automatic load sequencer. The sequencing logic controls the permissive starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. The Frequency of 18 months takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. SR 3.8.1.16 requires verifying the load transfer from the Unit auxiliary transformer to the start up transformer. Transfer of the 4.160 kV bus 2 power supply from the auxiliary transformer to the start up transformer demonstrates the OPERABILITY of the offsite circuit network to power the shutdown loads. Therefore these are more restrictive requirements upon unit operation and are consistent with ISTS.

M7 A CTS specification comparable to ITS Specification 3.8.2 does not exist. Specification 3.8.2 provides requirements for the AC sources in MODES 5 and 6 and during movement of irradiated fuel assemblies. The AC sources required to be OPERABLE in MODES 5 and 6 and any time during movement of irradiated fuel assemblies provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

Therefore this is a more restrictive requirement upon unit operation and is consistent with ISTS.

M8 The CTS does not contain explicit requirements for the DG air subsystem. However conditions which resulted in degraded conditions on the DG air subsystem are encompassed within the definition of OPERABLE for the associated DG. Provided the DG is capable of one start, a reasonable interpretation of the CTS would permit unrestricted operation, since under these conditions, the DG still remains OPERABLE. ITS 3.8.3 RA C.1 imposes a requirement that the air start receivers be pressurized to 210 psig (sufficient air for eight DG starts without refilling). If the quantity of air is less than 210 psig but greater than 100 psig (sufficient for one start), ITS 3.8.3 RA C.1 permits up to 48 hours to restore the air receiver pressure. With starting air receiver pressure < 210 psig, sufficient capacity for eight successive DG start attempts does not exist. However, as long as the receiver pressure is

> 100 psig, there is adequate capacity for at least one start attempt, and the DG can be considered OPERABLE while the air receiver pressure is restored to the required limit. A period of 48 hours is considered sufficient to complete restoration to the required pressure prior to declaring the DG inoperable. Therefore this is a more restrictive requirement upon unit operation and is consistent with ISTS.

M9 CTS requirements comparable to ITS SR 3.8.3.3 and SR 3.8.3.4 do not exist. SR 3.8.3.3 ensures that, without the aid of the refill compressor, sufficient air start capacity for each DG is available. The system design requirements provide for a minimum of eight engine start cycles without recharging. The pressure specified in this SR is intended to reflect the lowest value at which the eight starts can be accomplished. The 31 day Frequency takes into account the capacity, capability, redundancy, and diversity of the AC sources and other indications available in the control room, including alarms, to alert the operator to below normal air start pressure. SR 3.8.3.4 requires removal of water from the Unit 2 DG fuel storage tank once every 31 days Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the Unit 2 DG fuel storage tank once every 31 days eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Therefore these are more restrictive requirements upon unit operation and are consistent with ISTS.

M10 With one inoperable battery CTS 3.7.2.f permits two hours to restore the battery to OPERABLE status or be in hot shutdown within 8 hours and cold shutdown within the next 30 hours. With both battery chargers for a battery inoperable CTS 3.7.2.h permits two hours to restore the battery to OPERABLE status or be in hot shutdown within 8 hours and cold shutdown within the next 30 hours. ITS 3.8.4 RA A.1 permits a DC power subsystem to be inoperable for up to 2 hours, after which ITS RA B.1 and B.2 require the unit to be placed MODE 3 within 6 hours and MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems. Therefore these are more restrictive requirements upon unit operation and are consistent with ISTS.

M11 CTS 4.6.3.5 requires performance of a battery load test every 5 years, but does not prescribe definitive performance criteria. ITS SR 3.8.4.6 specifies definitive performance criteria for each battery. The acceptance criteria for this Surveillance are consistent with IEEE-450 . CTS surveillance requirements comparable to ITS SR 3.8.4.6 expanded

testing requirements do not exist. If the battery shows degradation, or if the battery has reached 85% for Battery "A" or 95% for Battery "B" of its expected life, the Surveillance Frequency is reduced to 18 months. Degradation is indicated, according to IEEE-450 , when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is ≥ 10% below the manufacturer's rating. These Frequencies are generally consistent with the recommendations in IEEE-450 with an extra allowance for an 18 month test frequency for batteries which have shown degradation or have reached 85% for battery "A" and 95% for battery "B" of expected life. Therefore these are more restrictive requirements upon unit operation and are consistent with ISTS.

M12 CTS 4.6.5 requires verifying in-service charger voltage but does not prescribe definitive performance criteria. Since the chargers are normally connected to the batteries maintaining the float voltage, this test is also testing battery float voltage. ITS SR 3.8.4.1 specifies a definitive performance criteria for a battery on float charge. Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the charging system and the ability of the batteries to perform their intended function. Therefore this is a more restrictive requirement upon unit operation and is consistent with ISTS.

M13 CTS requirements comparable to ITS SR 3.8.4.2, SR 3.8.4.3 and SR 3.8.4.4 do not exist. SR 3.8.4.2 requires a visual inspection of the battery cells, cell plates, and battery racks which provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The 18 month frequency is based on engineering judgement and operational experience and is sufficient to detect battery and rack degradation on a long term basis. SR 3.8.4.3 requires a visual inspection of intercell, intertier, and terminal connections which provide an indication of physical damage or abnormal deterioration that could indicate degraded battery condition. The 18 month frequency is based on engineering judgement taking into consideration the likelihood of a change in component or system status. SR 3.8.4.4 requires that each battery charger be capable of supplying ≥ 300 amps at ≥ 125 V for ≥ 4 hours. These current and voltage requirements are based on the design capacity of the chargers. The battery charger supply is based on normal DC loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state. The minimum required amperes and duration ensures that these requirements can be satisfied. The Surveillance Frequency is acceptable, given the other administrative controls existing to ensure adequate charger performance during these 18 month intervals. Therefore this is a more restrictive requirement upon unit operation and is consistent with ISTS.

M14 CTS requirements comparable to ITS Specification 3.8.5 do not exist. Specification 3.8.5 provides requirements for DC sources in MODES 5, 6 and when moving irradiated fuel assemblies. The DC electrical power sources required to be OPERABLE in MODES 5 and 6, and during movement of irradiated fuel assemblies, provide assurance that:

a. Required features to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core;

b. Required features needed to mitigate a fuel handling accident are available;

c. Required features necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

This is a more restrictive requirement upon unit operation and is consistent with ISTS.

M15 CTS requirements comparable to ITS LCO 3.8.6, Applicability and SR 3.8.6.3 do not exist. The addition of these requirements is therefore a more restrictive requirement upon unit operation and is consistent with ISTS. CTS does not impose any requirements for the Batteries except when the reactor is critical. The applicability for ITS LCO 3.8.6 is when associated DC electrical power subsystems are required to be OPERABLE. ITS 3.8.5 imposes requirements for DC electrical power systems in MODES 5 and 6. The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining at least one train of DC sources OPERABLE during accident conditions, in the event of:

a. An assumed loss of all offsite AC power or all onsite AC power; or

b. An assumed loss of offsite power and a worst case single active failure.

SR 3.8.6.2 requires a quarterly inspection of specific gravity and voltage which is consistent with IEEE-450 (Ref. 3). In addition, within 24 hours of a battery discharge < 110 V or a battery overcharge > 150 V, the battery must be demonstrated to meet Category B limits. Transients, which may momentarily cause battery voltage to drop to ≤ 110 V, do not

constitute a battery discharge provided the battery terminal voltage and float current return to pre-transient values. This inspection is also consistent with IEEE-450 (Ref. 3), which recommends special inspections following a severe discharge or overcharge, to ensure that no significant degradation of the battery occurs as a consequence of such discharge or overcharge. SR 3.8.6.3 requires verification that the average temperature of representative cells is ≥ 55°F for the "A" battery and ≥ 67°F for the "B" battery, is consistent with a recommendation of IEEE-450 (Ref. 3), that states that the temperature of electrolytes in representative cells should be determined on a quarterly basis. This SR ensures that the operating temperatures remain within an acceptable operating range. These limits are based on manufacturer recommendations and unit specific calculations regarding available battery ampacity and battery temperature. Unit specific calculations are based on battery ampacity available at the specified battery temperature. The additional applicability for battery cell parameters in MODES 5 and 6 is an additional restriction upon unit operation and is consistent with ISTS. Battery cell parameters are required when the DC power source is required to be OPERABLE.

M16 CTS requirements comparable to ITS Specification 3.8.7 do not exist. The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR assume Engineered Safety Feature systems are OPERABLE. The AC Instrument Bus Sources are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to portions of the RPS and ESFAS instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded. The OPERABILITY of the AC Instrument Bus Sources is consistent with the initial assumptions of the accident analyses and is based on meeting the design basis of the unit. This includes maintaining required AC instrument buses OPERABLE during accident conditions in the event of:

a. An assumed loss of all offsite AC electrical power or all onsite AC electrical power; or

b. An assumed loss of offsite power and a worst case single active failure.

Therefore this is a more restrictive requirement upon unit operation and is consistent with ISTS.

M17 CTS requirements comparable to ITS Specification 3.8.8 do not exist. The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR assume Engineered Safety Feature systems are OPERABLE. The AC Instrument Bus Sources are designed to provide the required capacity, capability, redundancy, and reliability to ensure the

availability of necessary power to the Reactor Protective System and Engineered Safety Features Actuation System instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded. The OPERABILITY of the AC Instrument Bus Sources is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY. The OPERABILITY of the minimum AC Instrument Bus Sources to each AC instrument bus during MODES 5 and 6 ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate power is available to mitigate events postulated during shutdown, such as a fuel handling accident.

Therefore this is a more restrictive requirement upon unit operation and is consistent with ISTS.

M18 With the exception of the LCO for DC distribution systems and certain surveillance requirement associated with circuit protection features, CTS requirements comparable to ITS 3.8.9 do not exist. The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR assume ESF systems are OPERABLE. The AC, DC, and AC instrument bus electrical power distribution systems are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the AC, DC, and AC instrument bus electrical power distribution systems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining power distribution systems OPERABLE during accident conditions in the event of:

a. An assumed loss of all offsite power or all onsite AC electrical power; or

b. An assumed loss of offsite power and worst case single active failure.

CTS 3.7.2.e requires the DC distribution system to be OPERABLE with the reactor critical. This CTS applicability is comparable to ITS MODES 1 and 2. ITS LCO 3.8.9 imposes requirements on the DC distribution requirements applicable in MODES 1, 2, 3 and 4. The electrical power

distribution subsystems are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

b. Adequate core cooling is provided, and containment OPERABILITY and other instrument functions are maintained in the event of a postulated DBA.

Therefore these are more restrictive requirements upon unit operation and are consistent with ISTS.

M19 CTS 4.6.1.3 requires the specified diesel protective bypasses be demonstrated to be OPERABLE, but does not specify a surveillance frequency. ITS SR 3.8.1.10 requires verification every 18 months that the automatic trips except engine overspeed are bypassed. Engine overspeed is the only automatic DG trip which is not bypassed. The 18 month Frequency is based on engineering judgment, taking into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. The addition of the 18 month SR frequency is a more restrictive requirement upon unit operation and is consistent with ISTS.

M20 With an inoperable DC or AC instrument bus power electrical distribution subsystem, CTS does not provide any specific actions. In this condition the actions are specified by 3.0. CTS 3.0 requires the unit be placed in hot shutdown within 8 hours and cold shutdown within an additional 30 hours. ITS 3.8.9 RA B.1 and C.1 permits up to two hours to restore the DC and AC instrument bus power electrical distribution subsystem to OPERABLE status. This Completion time is reasonable to complete the Required Action. With Required Actions and associated Completion Times not met, ITS 3.8.9 RA F.1 and F.2 requires the unit be placed in MODE 3 within 6 hours and MODE 5 within 36 hours. With an inoperable DC or AC instrument bus power electrical distribution subsystem, both CTS and ITS require achieving hot shutdown within eight hours and cold shutdown within 38 hours. In addition to the above requirements ITS 3.8.9 RA B.1 and C.1 limits the overall time to be in the associated Conditions to no more than 16 hours from discovery of failure to meet the LCO. The second Completion Time establishes a limit on the maximum time allowed for any combination of required distribution subsystems to be inoperable during any single contiguous occurrence of failing to meet the LCO.

Therefore the change is a more restrictive requirement upon unit operation and is consistent with ISTS.

M21 CTS 3.7.1. requires the startup transformer to be in service and the 4160 V buses 2 and 3 energized. The startup transformer and the 4160 V bus 2 and 3 comprise most, but not all, of the offsite circuit. ITS LCO 3.8.1 requires the qualified circuit between the offsite transmission network and the onsite electrical power distribution system to be OPERABLE. The inclusion of the remainder of the offsite circuit (from the 4160 V buses 2 and 3 to the 480 V buses E1 and E2 as well as the requirement the offsite circuit to be OPERABLE in lieu of energized is a more restrictive requirement upon unit operation and is consistent with ISTS. Inclusion of the remainder of the offsite circuit and the requirement for the offsite circuit to be energized as well as OPERABLE is necessary to ensure the offsite circuit is OPERABLE and energized when necessary.

M22 A CTS requirement comparable to ITS SR 3.8.9.1 does not exist. SR 3.8.9.1 verifies that the required AC, DC, and AC instrument bus electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence of the electrical divisions is maintained, and the appropriate voltage is available to each required bus. The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC instrument bus electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions. Therefore this is a more restrictive requirements upon unit operation and is consistent with ISTS.

M23 CTS requirements comparable to ITS Specification 3.8.10 do not exist. The OPERABILITY of the minimum AC, DC, and AC instrument bus electrical power distribution subsystems during MODES 5 and 6, and during movement of irradiated fuel assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

Therefore this is a more restrictive requirement upon unit operation and is consistent with ISTS.

M24 The footnote (*) to CTS 4.6.1.5 permits loads in excess of the specified limits for special testing under direct monitoring of the manufacturer. For consistency with the NUREG, this provision is not retained in the ITS. HBR does not anticipate a need for this special testing provision. Elimination of this provision, is a more restrictive requirement upon unit operation and is consistent with ISTS.

M25 CTS 4.6.1.1 requires the DG be manually started, synchronized, loaded and run for ≥ 60 minutes within a specified load range. ITS SR 3.8.1.2 includes additional requirements regarding achieving steady state voltage and frequency within specified limits. The minimum voltage and frequency stated in the SR are those necessary to ensure the DG can accept DBA loading while maintaining acceptable voltage and frequency levels. Stable operation at the nominal voltage and frequency values is also essential to establishing DG OPERABILITY. These are additional restrictions upon unit operation and are consistent with ISTS.

M26 CTS 4.6.3.1 and 4.6.3.2 require measurement and recording of specified battery parameters but does not specify performance limitations. ITS SR 3.8.6.1 requires verification that battery parameters meet Table 3.8.6-1 limits. SR 3.8.6.1 verifies that Category A battery cell parameters are consistent with IEEE-450, which recommends regular battery inspections (at least one per month) including voltage, specific gravity, and electrolyte temperature of pilot cells. Category A defines the normal parameter limit for each designated pilot cell in each battery. The cells selected as pilot cells are those whose temperature, voltage, and electrolyte specific gravity approximate the state of charge of the entire battery. The addition of the more prescriptive requirements encompassed within ITS SR 3.8.6.1 is an additional restriction on plant operation and is consistent with ISTS.

M27 CTS 3.7.1.b requires the 480 V buses E1 and E2 to be energized. ITS LCO 3.8.9 requires the Train A and Train B AC distribution subsystems to be OPERABLE. Requiring these trains to be OPERABLE is necessary to assure their capability to perform their specified safety function. Requiring Train A and Train B distribution subsystems to be OPERABLE in lieu of energized is a more restrictive requirement upon unit operation and is consistent with the ISTS.

M28 CTS requirements comparable to ITS 3.8.3 RA C.1 do not exit. ITS 3.8.3 RA C.1 requires restoring stored fuel oil to within limit within 30 days for new fuel not within limits. There is no explicit CTS limit or surveillance requirement for new fuel oil. New fuel oil is received and stored in the Unit 1 IC turbine fuel oil storage tanks until transferred to the Unit 2 storage tank. Fuel oil is not required to be tested until prior to transfer to the Unit 2 storage tank. The additional restriction regarding new fuel not within limits is a more restrictive

requirement upon unit operation and is consistent with the NUREG. With the new fuel oil properties defined in the Bases for SR 3.8.3.4 not within the required limits, a period of 30 days is allowed for restoring the stored fuel oil properties. This period provides sufficient time to test the stored fuel oil to determine that the new fuel oil, when mixed with previously stored fuel oil, remains acceptable, or to restore the stored fuel oil properties.

M29 CTS 4.6.3.1 requires measurement and recording of the temperature of battery electrolyte of the battery's pilot cell. ITS SR 3.8.6.3 requires verifying the average of representative cells is within specified limits. The requirement to verify the average of representative cell is within limit is a more restrictive requirement upon unit operations and is consistent with the NUREG. This verification that the average temperature of representative cells is > specified limits, is consistent with a recommendation of IEEE-450, that states that the temperature of electrolytes in representative cells should be determined on a quarterly basis.

TECHNICAL CHANGES - LESS RESTRICTIVE (GENERIC)

LA1 CTS 3.7.1.d requires that listed protective trips be bypassed. The list of DG trips is relocated to the Bases of ITS LCO 3.8.1. CTS 3.7.2.e permits, but does not require, removing the bypass of these DG protective trips after a DG has properly assumed the load on its bus. The trips are also those listed in CTS specification 3.7.1.

The details associated with the involved Specifications are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains the requirement for OPERABILITY of the AC power sources. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and utility resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA2 CTS 3.7.3 restricts the operating conditions when energizing the emergency buses through the main and unit auxiliary transformer. This restriction is not retained in ITS but is relocated to the Bases of LCO 3.8.1.

The restriction associated with the involved Specifications is not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains the requirement for

OPERABILITY of the AC power sources. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and utility resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA3 CTS 4.6.1.3 specifies the test methodology for testing the bypass of the DG protective trips. The detail regarding this test methodology are not retained in the ITS, but are relocated to the Bases of SR 3.8.1.11. Bases changes are controlled in accordance with ITS 5.5.14, Technical Specification Bases Control Program.

The details associated with the involved Specifications are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains the requirement for OPERABILITY of the AC power sources. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and utility resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA4 CTS 4.6.1.3 requires an inspection of each DG at each refueling. This inspection requirement is not retained in the ITS but is relocated to the UFSAR. Changes to the UFSAR are controlled in accordance with 10 CFR 50.71(e) and 10 CFR 50.59. The performance of this inspection has no direct impact on operability of the DG.

The inspection associated with the involved Specifications is not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains the requirement for OPERABILITY of the AC power sources. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and utility resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA5 CTS 4.6.1.4 contains details regarding DG load limits during DG operation. The details regarding the load limits are not retained in the ITS, but are relocated to the ITS Bases. Changes to the Bases are controlled in accordance with ITS 5.5.14, Technical Specification Bases Control Program.

CTS 4.6.1.5 contains details regarding DG testing method. The details regarding the test method are not retained in the ITS, but are relocated to appropriate plant controlled documents.

The details associated with the involved Specifications are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains the requirement for OPERABILITY of the AC power sources. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and utility resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA6 CTS Table 4.1.2, items 11 and 12 contain details associated with testing the DG fuel oil. The details regarding the DG fuel oil testing are not retained in the ITS, but are relocated to appropriate plant controlled documents.

The details associated with the involved Specifications are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains the requirement for OPERABILITY of the AC power sources. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and utility resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA7 CTS 4.6.3.2 and 4.6.3.4 specify details regarding battery testing methodology and data recording. These details regarding the battery testing are not retained in the ITS, but are relocated to appropriate plant controlled documents.

The details associated with the involved Specifications are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains the requirement for OPERABILITY of the batteries. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The

level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and utility resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA8 The CTS 3.7.1.a and c statements regarding the 110 kV-4160 volt start-up transformer being in service and the 4160 V buses 2 and 3 being energized is relocated to the ITS bases.

The detail associated with the involved Specifications are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains the requirement for OPERABILITY of the AC power sources. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and utility resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of this detail is acceptable.

LA9 The CTS 3.7.1.b detail regarding the 480 V buses E1 and E1 is relocated to the ITS bases.

The detail associated with the involved Specifications is not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains the requirement for OPERABILITY of the AC distribution system. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and utility resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of this detail is acceptable.

LA10 The CTS 3.7.1.e details regarding the batteries and battery chargers are relocated to the ITS bases.

The details associated with the involved Specifications are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains the requirement for OPERABILITY of the AC distribution system. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and utility resources associated with

processing license amendments to these requirements will be reduced. Therefore, relocation of this detail is acceptable.

TECHNICAL CHANGES - LESS RESTRICTIVE (SPECIFIC)

L1 Although the CTS definition for OPERABLE imposes requirements for normal and emergency sources in conjunction with requirements for redundant components, an action comparable to ITS 3.8.1 RA A.1 and B.2 do not exist. With an inoperable DG and concurrent inoperability of redundant required features powered by the remaining OPERABLE DG, CTS actions are controlled by 3.0. CTS 3.0 requires the unit be placed in hot shutdown within 8 hours and cold shutdown within an additional 30 hours. ITS RA A.1 permits delaying the declaration or required supported features inoperable for up to 12 hours after discovery of the Condition concurrent with an inoperable redundant feature. ITS 3.8.1 RA B.2 permits delaying the declaration or required supported features inoperable for up to 4 hours after discovery of the Condition concurrent with an inoperable redundant feature. Therefore these are less restrictive requirements upon plant operation and are consistent with ISTS.

In these Conditions, the remaining AC power sources are adequate to supply electrical power to the onsite Distribution System. Thus, on a component basis, single failure protection for the required feature's function may have been lost; however, function has not been lost. The specified Completion Times takes into account the OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the Completion Times take into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

L2 CTS 3.7.1 specifies requirements associated with DG fuel oil. The CTS requires an available quantity of DG fuel oil sufficient to run one DG for 7 days at full load. If the requirements for DG fuel oil are not met both DGs are required to be declared inoperable. In this condition the actions are specified by 3.0. CTS 3.0 requires the unit be placed in hot shutdown within 8 hours and cold shutdown within an additional 30 hours. ITS 3.8.3 RA A.1 and B.1 collectively permit a reduction in DG fuel oil quantity equivalent to a 1 day fuel supply of oil for up to 48 hours. The 7 day storage requirement is 34,000 gals. Since the CLB for HBRSEP Unit No. 2 requires this total volume in two tanks, ITS Action A and B maintain a 6 day minimum storage by reducing the required volume in the Unit 2 DG fuel oil storage tank and the total onsite storage requirement in both tanks by the 1 day consumption (34,000 / 7 ≈ 4,855 gals). The resultant limits of 14,145 gals and 29,145 gals for the Unit 2 DG storage tank and total onsite storage, respectively, still

maintains a minimum six day supply onsite. This is a less restrictive requirement upon plant operation and is consistent with ISTS.

This restriction allows sufficient time for obtaining the requisite replacement volume and performing the analyses (as required) prior to addition of fuel oil to the tank. A period of 48 hours is considered sufficient to complete restoration of the required level prior to declaring the DG inoperable. This period is acceptable based on the remaining capacity (> 6 days), the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period.

L3 With battery cell parameters not within limits, CTS does not provide any allowable time to restore the battery within limits. ITS 3.8.6 RA A provides time to restore the cell parameters when the battery parameters are not within limits. When one battery is inoperable, the CTS 3.7.2.f requires the affected battery to be declared inoperable and the Required Actions for the inoperable battery to be taken (2 hour allowed outage time). If more than one battery is affected the plant is required to shutdown per CTS 3.0. IST 3.8.6 RA A allows a 31 day restoration time (Action A.3) for one or more batteries with battery cell parameters not within Category A or B limits provided Action A.1 and A.2 are met as specified below.

- Action A.1: 1 hour is allowed to verify pilot cell electrolyte level and float voltage meet Table 3.8.6-1 Category C limits. This provides a quick indication of the status of the remainder of the battery cells. One hour provides time to inspect the electrolyte level and to confirm the float voltage of the pilot cells.

- Action A.2: 24 hours and once per 7 days thereafter is allowed to verify battery cell parameters meet Table 3.8.6-1 Category C limits. This provides assurance that during the time needed to restore the parameters to the Category A and B limits, the battery is still capable of performing its intended function. A period of 24 hours is allowed to complete the required verification because specific gravity measurements must be obtained for each connected cell. The 7 day interval is consistent with the normal Surveillance Frequency.

This change is consistent with ISTS and is considered acceptable since the interim actions prior to restoration of battery cell parameters require verifications to be performed which demonstrate that the affected battery while degraded still has sufficient capacity to perform its intended function.

L4 CTS 4.6.5 requires verification of battery charger output voltage daily 5 days per week and during equalization charges. ITS SR 3.8.4.1 requires verification the battery voltage is ≥ 130.2 V on float charge at a 7 day frequency. The requirement for voltage monitoring while on equalizing charge is not retained in the ITS. Since ITS does not require voltage verification during an equalization charge and has a reduced frequency for the float charge verification, this is a less restrictive requirement upon plant operation and is consistent with ISTS.

An equalization charge is a special charge given a battery when non-uniformity in voltage or specific gravity has developed between cells. It is given to restore all cells to a fully charged condition using a charging voltage higher than the normal float voltage. Therefore the voltage used to provide the equalization charge is not a valid measurement of battery operability and is inappropriate for an ITS SR parameter. The 7 day Frequency is consistent with manufacturer recommendations and IEEE-450 (1980).

L5 With an inoperable AC power electrical distribution subsystem, CTS does not provide any specific actions. In this condition the actions are specified by 3.0. CTS 3.0 requires the unit be placed in hot shutdown within 8 hours and cold shutdown within an additional 30 hours. ITS 3.8.9 RA A.1 permits up to eight hours to restore the AC electrical distribution subsystem to OPERABLE status. Therefore this aspect of this change is a less restrictive requirement upon plant operation and is consistent with ISTS. ITS 3.8.9 RA A.1 limits the overall time to be in the associated Conditions to no more than 16 hours from discovery of failure to meet the LCO. This aspect of this change is a more restrictive requirement upon unit operation and is consistent with ISTS.

With one or more required AC buses, load centers, motor control centers, or distribution panels in one train inoperable, the remaining AC electrical power distribution subsystem in the other train is capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining power distribution subsystems could result in the minimum required ESF functions not being supported. Therefore, the required AC buses, load centers, motor control centers, and distribution panels must be restored to OPERABLE status within 8 hours. The 8 hour time limit before requiring a unit shutdown in this Condition is acceptable because of:

a. The potential for decreased safety if the unit operator's attention is diverted from the evaluations and actions necessary

to restore power to the affected train, to the actions associated with taking the unit to shutdown within this time limit; and

b. The potential for an event in conjunction with a single failure of a redundant component in the train with AC power.

L6 CTS 4.6.3.1 requires verification of pilot cell voltage and temperature at a frequency of 5 days per week. ITS SR 3.8.6.1 requires verification of pilot cell parameters at a 7 day frequency. This is consistent with IEEE-450, which recommends regular battery inspections (at least one per month) including voltage, specific gravity, and electrolyte temperature of pilot cells. this is a less restrictive requirement upon plant operation and is consistent with ISTS.

L7 CTS 4.6.3.3 requires the batteries by subjected to an equalization charge annually. This requirement is not retained in the ITS. An equalization charge is a special charge given a battery when non-uniformity in voltage or specific gravity has developed between cells. It is given to restore all cells to a fully charged condition using a charging voltage higher than the normal float voltage. Therefore it is inappropriate to mandate an equalization charge at a set frequency. The ITS SRs provide appropriate verification of battery parameters. When the need for an equalization charge is indicated by battery parameters, an equalization charge can be utilized to restore all cells to a fully charged condition. This is appropriately controlled by plant procedures.

L8 CTS 4.6.1.5 require the DG be tested with a load between 2650 kW and 2750 kW for two hours. ITS SR 3.8.11 requires this load be maintained for ≥ 1.75 hours. The two hour value specified in CTS 4.6.1.5 cannot be exceeded in any 24 hour period. The two hours specified in CTS is also the maximum time that the DG can be operated in excess of its rating during any 24 hour period based on DG manufacturers requirements. The reduction from 2 hours to 1.75 hours provides flexibility in performing the SR without the DG exceeding its manufacturer's recommended time limit. The reduction in time at an overload condition provides time to adjust DG load as required to perform this SR. The specified run time of 1.75 hours is well in excess of any expected requirement under emergency conditions. The ITS test duration of ≥ 1.75 hours is adequate to confirm the DGs operability without exceeding the DGs rating. The actual DG load during an accident will exceed the continuous load rating of 2500 kW for a period less than the specified test interval of 1.75 hours. This change is a less restrictive change upon plant operation and is consistent with ISTS.

L9 CTS Table 4.1-3, item 18 requires testing the magnetic and thermal trip elements for the molded case circuit breakers supplying the automatic

bus transfer device associated with Auxiliary Feedwater header discharge valve to steam generator A, V2-16A and Turbine Building Cooling Water isolation valve V6-16C. ITS SR 3.8.9.2 and SR 3.8.9.3 requires verifying the trip capability (magnetic only) for both of these breakers. The involved breakers have been replaced with breakers having a higher current interrupt capability and the replacement breakers do not utilize thermal protection at the breaker. A circuit thermal protection device is provided at the motor contactor. Elimination of the testing of these thermal trip elements is necessary to reflect current plant configuration and is a less restrictive requirement upon plant operation. The requirement to verify magnetic trip capability only is a less restrictive requirement upon unit operation.

The subject breakers are required to function to ensure a fault is isolated by the device closest to a fault prior to any impact upon an upstream protective device in either load train. Appropriate circuit coordination using only the magnetic protection device has been confirmed by calculation. Therefore, utilization of a thermal trip element is unnecessary.

L10 CTS 4.6.3.1 requires measuring pilot cell temperature 5 times per week. ITS SR 3.8.6.3 requires verifying average electrolytic temperature of representative cells is ≥ specified values at a 92 day frequency. The reduction in frequency of measuring battery temperature is a less restrictive requirement upon unit operation and is consistent with the NUREG. The 92 day frequency is based on the recommendations of IEEE-450 that states that the temperature of electrolytes in representative cells should be determined on a quarterly basis.

L11 CTS 4.6.3.2 requires measuring and recording battery parameters every month. IST SR 3.8.6.2 requires verifying battery cell parameters meet Category B limits every 92 days. The reduction in surveillance frequency from monthly to every 92 days is a less restrictive requirement upon unit operations and is consistent with the NUREG. The quarterly inspection of specific gravity and voltage is consistent with IEEE-450. [We have reviewed our surveillance history and . . . . Based on these results using a monthly surveillance frequency, a reduction in the frequency to 92 days is considered justified.]

TECHNICAL CHANGES - RELOCATED SPECIFICATIONS

None

L10 Change

Carolina Power & Light Company has evaluated the proposed Technical Specification change and has concluded that it does not involve a significant hazards consideration. Our conclusion is in accordance with the criteria set forth in 10 CFR 50.92. The bases for the conclusion that the proposed change does not involve a significant hazards consideration are discussed below.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   The proposed change does not involve any changes in parameters governing normal plant operation. Battery electrolyte temperature not assumed to be an initiator of any accident previously evaluated. The surveillance still confirms proper electrolyte temperature, although at a reduced frequency. As a result, the probability of an accident is not significantly affected by the reduction in the surveillance frequency. The consequences of an accident are independent of the frequency of measuring battery electrolyte temperature. Accordingly, the consequences of an accident are not significantly increased. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not involve any changes in parameters governing normal plant operation. Appropriate electrolyte temperature is still verified. The frequency of the surveillance is consistent with the recommendations of IEEE Standard 450. The change still provides reasonable assurance the batteries will perform their required function. Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.

3. Does this change involve a significant reduction in a margin of safety?

   Battery electrolyte temperature is continued to be measured at an appropriate frequency, although reduced frequency. Therefore, the margin of safety is not significantly reduced.

L11 Change

Carolina Power & Light Company has evaluated the proposed Technical Specification change and has concluded that it does not involve a significant hazards consideration. Our conclusion is in accordance with the criteria set forth in 10 CFR 50.92. The bases for the conclusion that the proposed change does not involve a significant hazards consideration are discussed below.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   The proposed change does not involve any changes in parameters governing normal plant operation. Battery parameters not assumed to be an initiator of any accident previously evaluated. The surveillance still confirms battery cell parameters are within specified limits, although at a reduced frequency. As a result, the probability of an accident is not significantly affected by the reduction in the surveillance frequency. The consequences of an accident are independent of the frequency of measuring battery cell parameters. Accordingly, the consequences of an accident are not significantly increased. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not involve any changes in parameters governing normal plant operation. Battery cell parameters are still verified to be within limits. The frequency of the surveillance is consistent with the recommendations of IEEE Standard 450. The change still provides reasonable assurance the batteries will perform their required function. Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.

3. Does this change involve a significant reduction in a margin of safety?

   Battery cell parameters continue to be verified at an appropriate frequency, although reduced frequency. Therefore, the margin of safety is not significantly reduced.

RELOCATED CHANGES

None

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9 (8) [M 6]	------NOTES------ 1. This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. (TSTF-8, R2) 2. If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ [0.9]. ------ Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ [63] Hz; (68.7 Hz) b. Within [3] seconds following load rejection, the voltage is ≥ [3740] V (467) and ≤ [4580] V; and (493) c. Within [3] seconds following load rejection, the frequency is ≥ [58.8] Hz and ≤ [61.2] Hz.	[18 months]
SR 3.8.1.10 (13)	------NOTE------ This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. ------ Verify each DG operating at a power factor ≤ [0.9] does not trip and voltage is maintained ≤ [5000] V during and following a load rejection of ≥ [4500] kW and ≤ [5000] kW.	[18 months]

(continued)

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.8 (9) [3.7.2.e] [M6]	------------------NOTES------------------ 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. (Insert 3.8.1-5) (11) TSTF-8, Rev. 2 -- Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ [10] seconds, 2. energizes auto-connected shutdown loads through [automatic load sequencer], 3. maintains steady state voltage ≥ [3740] (467) V and ≤ [4580] (493) V, 4. maintains steady state frequency ≥ [58.8] Hz and ≤ [61.2] Hz, and 5. supplies permanently connected [and auto-connected] shutdown loads for ≥ 5 minutes.	[18 months]

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9 (10)	-------------------NOTES------------------- 1. All DG starts may be preceded by prelube period. 2. This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. -- TSTF-8, Rev. 2 Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each DG auto-starts from standby condition and: a. In ≤ [10] seconds after auto-start and during tests, achieves voltage ≥ [3740] V and ≤ [4580] V; b. In ≤ [10] seconds after auto-start and during tests, achieves frequency ≥ [58.8] Hz and ≤ [61.2] Hz; c. Operates for ≥ 5 minutes; d. Permanently connected loads remain energized from the offsite power system; and e. Emergency loads are energized [or auto-connected] through the automatic load sequencer] from the offsite power system.	[18 months] Insert 3.8.1-6 (11) Insert 3.8.1.6A (37)

[M6]

(continued)

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.13 (11)	---------------------------NOTE--------------------------- This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. -- (14) [4.6.1.3] Verify each DG's automatic trips are bypassed on [actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated ESF actuation signal] except: (14) a. Engine overspeed; [and] b. Generator differential current; (27) c. [Low lube oil pressure;] d. [High crankcase pressure;] and e. [Start failure relay].	[18 months]

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.14 (12) [4.6.1.5 * Footnote] [A 8]	---NOTES--- 1. Momentary transients outside the load and power factor ranges do not invalidate this test. 2. This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. (TSTF-8, Rev. 2) ------ Insert 3.8.1.7A (11)	
[4.6.1.5]	Verify each DG operating at a power factor ≤ [0.9] operates for ≥ 24 hours: a. For ≥ [2] (1.75) hours loaded ≥ [5250] (2650) kW and ≤ [5500] (2750) kW; and b. For the remaining hours of the test loaded ≥ [4500] (2400) kW and ≤ [5000] (2500) kW.	[18 months]
SR 3.8.1.15 (13)	---NOTES--- 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ [2] hours loaded ≥ [4500] (2400) kW and ≤ [5000] (2500) kW. Momentary transients outside of load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. ------	
[M 6]	Verify each DG starts and achieves, in ≤ [10] seconds, voltage ≥ [3740] (4160) V, and ≤ [4580] V and frequency ≥ [58.8] Hz and ≤ [61.2] Hz. Insert 3.8.1-7 (37)	[18 months]

(continued)

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.18 (14) [M 6]	-------------------NOTE------------------- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. -- TSTF-8, Rev. 2 Verify interval between each sequenced load block is within ± [10% of design interval] (0.4 seconds) for each emergency [and shutdown] load sequencer.	[18 months]
SR 3.8.1.19 (15) [A 8] [A 8] [3.7.2.e] [4.6.1.2]	-------------------NOTES------------------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. (11) Insert 3.8.1-8 -- TSTF-8, Rev. 2 Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ [10] seconds.	[18 months]
		(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.1.19 (continued) 15 2. energizes auto-connected emergency loads through load sequencer, 3. achieves steady state voltage ≥ [3740] V and ≤ [4580] V, 467 493 4. achieves steady state frequency ≥ [58.8] Hz and ≤ [61.2] Hz, and 5. supplies permanently connected [and auto-connected] emergency loads for ≥ 5 minutes. [M6]	15 Insert B3.8.1-9
SR 3.8.1.20 17 [M6] -------------------NOTE------------------- All DG starts may be preceded by an engine prelube period. -- Verify when started simultaneously from standby condition, each DG achieves, in ≤ [10] seconds, voltage ≥ [3744] V and ≤ [4576] V, and frequency ≥ [58.8] Hz and ≤ [61.2] Hz. 467	10 years Insert 3.8.1-10 37

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Insert 3.8.1-9

SR 3.8.1.16	-------------------NOTE------------------- 1. This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. 2. SR 3.8.1.16 is not required to be met if 4.160 kV bus 2 and 480 V Emergency Bus 1 power supply is from the start up transformer. -- Verify automatic transfer capability of the 4.160 kV bus 2 and 480 V Emergency Bus 1 loads from the Unit auxiliary transformer to the start up transformer.	TSTF-8, Rev. 2 18 months

Insert 3.8.1-10

and frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains voltage ≥ 467 V and ≤ 493 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources – Shutdown

[M7] LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:

a. One qualified circuit between the offsite transmission network and the onsite ~~Class 1E~~ AC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems – Shutdown", and

b. One diesel generator (DG) capable of supplying one train of the onsite ~~Class 1E~~ AC electrical power distribution subsystem(s) required by LCO 3.8.10.

(2)

[M7] APPLICABILITY: MODES 5 and 6.
During movement of irradiated fuel assemblies.

ACTIONS

---- Note ----
LCO 3.0.3 is not Applicable.
(31)

CONDITION	REQUIRED ACTION	COMPLETION TIME
[M7] A. ~~One~~ The required offsite circuit inoperable.	------------NOTE------------ Enter applicable Conditions and Required Actions of LCO 3.8.10, with one required train de-energized as a result of Condition A. ----------------------------	
[M7]	A.1 Declare affected required feature(s) with no offsite power available inoperable.	Immediately
	<u>OR</u>	
[M7]	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
		(continued)

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CTS

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
[M 7] A. (continued)	A.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>		
[M 7]	A.2.3	Initiate action to suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u>		
[M 7]	A.2.4	Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately
[M 7] B. ~~One~~ The required DG inoperable.	B.1	Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>		
[M 7]	B.2	Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>		
[M 7]	B.3	Initiate action to suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u>		
[M 7]	B.4	Initiate action to restore required DG to OPERABLE status.	Immediately

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SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
[M7] SR 3.8.2.1	-------------------NOTE------------------- The following SRs are not required to be performed: SR 3.8.1.3, ~~SR 3.8.1.9 through SR 3.8.1.11~~, SR 3.8.1.(13) through ~~SR 3.8.1.16~~, ~~SR 3.8.1.18~~, (17) ~~and~~ SR 3.8.1.(19). (15) SR 3.8.1.8 SR 3.8.1.9 --- For AC sources required to be OPERABLE, the SRs of Specification 3.8.1, "AC Sources – Operating," except ~~SR 3.8.1.8~~, SR 3.8.1.(17) (16) ~~and~~ SR 3.8.1.(20), (17) are applicable.	In accordance with applicable SRs

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STS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. C. One or more DGs with new fuel oil properties not within limits.	D.1 C.1 Restore stored fuel oil properties to within limits.	30 days
[M 8] E. D. One or more DGs with starting air receiver pressure < [225] 210 psig and ≥ [125] 100 psig.	E.1 D.1 Restore starting air receiver pressure to ≥ [225] 210 psig.	48 hours
[A 11] F. E. Required Action and associated Completion Time not met. OR One or more DGs common stored diesel fuel oil, lube oil, or starting air subsystem (18) not within limits for reasons other than Condition A, B, C, or D or E.	F.1 E.1 Declare associated DG (5) inoperable. for each DG (17)	Immediately

SURVEILLANCE REQUIREMENTS

INSERT 3.8.3-2 (17)

SURVEILLANCE		FREQUENCY
[TABLE 4.1-3 Item 10] SR 3.8.3.1	Verify each fuel oil storage tank contains ≥ [33,000] gal of fuel.	31 7 days (16)

(continued)

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CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
[M 13] SR 3.8.4 (6) (24)	------NOTE------ This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. ------ (33) Verify each battery charger supplies ≥ [400] (300) amps at ≥ [125] V for ≥ [8] (4) hours. (42) (43) (21)	[18 months]
SR 3.8.4 (7) (5) [4.6.3.6] [4.6.3.6] [4.6.3.6]	------NOTES------ (6) 1. The modified performance discharge test in SR 3.8.4 (8) may be performed in lieu of the service test in SR 3.8.4 (7) once per (60) (75) months. (3) (21) 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. ------ (TSTF-8, Rev. 2) Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	[18 months]

(continued)

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CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources – Shutdown

[M 14] LCO 3.8.5 DC electrical power subsystem shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems – Shutdown."

[M 14] APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

-----NOTE-----
LCO 3.0.3 is Not Applicable
----------------- (31)

CONDITION	REQUIRED ACTION	COMPLETION TIME
[M 14] A. One or more required DC electrical power subsystems inoperable.	A.1.1 Declare affected required feature(s) inoperable.	Immediately
	<u>OR</u>	
[M 14]	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
[M 14]	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
[M 14]	A.2.3 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u>	
		(continued)

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ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
[M 14] A. (continued)	A.2.4 Initiate action to restore required DC electrical power subsystems to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
[M14] SR 3.8.5.1	-------------------NOTE------------------- The following SRs are not required to be performed: SR 3.8.4.6 (4), SR 3.8.4.7 (A), and SR 3.8.4.8 (5) -- For DC sources required to be OPERABLE, the following SRs are applicable: SR 3.8.4.1 SR 3.8.4.4 ~~SR 3.8.4.7~~ SR 3.8.4.2 SR 3.8.4.5 ~~SR 3.8.4.8~~ SR 3.8.4.3 SR 3.8.4.6	In accordance with applicable SRs (34)

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ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME
[M16]	B. Required Action and associated Completion Time not met.	~~B~~ C.1	Be in MODE 3.	6 hours
		AND		
[M16]		~~B~~ C.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
[M16]	SR 3.8.7.1	Verify correct inverter voltage, ~~frequency,~~ and alignment to required AC ~~vital~~ Instrument buses.	7 days
[M16]			
	SR 3.8.7.2	Verify voltage availability + correct CVT alignment to required AC instrument buses.	7 days

23

24

23

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3.8 ELECTRICAL POWER SYSTEMS

AC Instrument Bus Sources

23

3.8.8 Inverters – Shutdown

2

[M17] LCO 3.8.8 Inverters shall be OPERABLE to support the onsite Class 1E AC vital bus electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems – Shutdown."

instrument

24

[M17] APPLICABILITY: MODES 5 and 6.
During movement of irradiated fuel assemblies.

------ NOTE ------
LCO 3.0.3 is not Applicable

31

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
[M17] A. One or more [required] inverters inoperable. (AC Instrument Bus Sources) (23)	A.1 Declare affected required feature(s) inoperable.	Immediately
	OR	
[M17]	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
[M17]	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	AND	
[M17]	A.2.3 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	AND	
		(continued)

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CTS

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME
[M17]	A. (continued)	A.2.4 Initiate action to restore ~~required~~ ~~inverters~~ AC Instrument Bus Sources to OPERABLE status.	Immediately

23

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY
[M17]	SR 3.8.8.1	Verify correct inverter voltage, ~~frequency~~, and alignments to required AC ~~vital~~ instrument buses.	7 days
[M17]	SR 3.8.8.2	Verify voltage availability and correct CVT alignment to required AC Instrument buses.	7 days

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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
[M20] ~~D~~ F. Required Action and associated Completion Time not met.	~~D~~ F.1 Be in MODE 3. AND ~~D~~ F.2 Be in MODE 5.	6 hours 36 hours
[A19] ~~E~~ G. Two trains with inoperable distribution subsystems that result in a loss of safety function.	~~E~~ G.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
[M22] SR 3.8.9.1	Verify correct breaker alignments and voltage to ~~required~~ AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems. (24)	7 days (Insert 3.8.9-2) (26)

[TABLE 4.1-3 Item 18]

— Note —
Actual voltage measurement is not required for the AC Instrument buses supplied from constant voltage transformers. (36)

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Insert 3.8.9-2

SR 3.8.9.2	Verify capability of the two molded case circuit breakers for AFW Header Discharge Valve to S/G "A," V2-16A to trip on overcurrent.	18 months
SR 3.8.9.3	Verify capability of the two molded case circuit breakers for Service Water System Turbine Building Supply Valve (emergency supply), V6-16C to trip on overcurrent.	18 months

CTS

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems – Shutdown

[M23] LCO 3.8.10 The necessary portion of AC, DC, and AC ~~vital~~ Instrument (24) bus electrical power distribution subsystems shall be OPERABLE to support equipment required to be OPERABLE.

[M23] APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

------ NOTE ------
LCO 3.0.3 is Not Applicable (31)

	CONDITION	REQUIRED ACTION		COMPLETION TIME
[M23]	A. One or more required AC, DC, or AC ~~vital~~ Instrument (24) bus electrical power distribution subsystems inoperable.	A.1	Declare associated supported required feature(s) inoperable.	Immediately
		OR		
[M23]		A.2.1	Suspend CORE ALTERATIONS.	Immediately
		AND		
[M23]		A.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
		AND		
[M23]		A.2.3	Initiate action to suspend operations involving positive reactivity additions.	Immediately
		AND		

(continued)

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ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
[M 23] A. (continued)	A.2.4 Initiate actions to restore required AC, DC, and AC ~~vital~~ Instrument bus electrical power distribution subsystems to OPERABLE status. (24)	Immediately
	AND	
[M 23]	A.2.5 Declare associated required residual heat removal subsystem(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
[M23] SR 3.8.10.1	Verify correct breaker alignments and voltage to required AC, DC, and AC ~~vital~~ Instrument bus electrical power distribution subsystems. (24)	7 days

----- Note -----
Actual voltage measurement is not required for the AC Instrument buses supplied from constant Voltage transformers (36)

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1 The HBRSEP design provides one circuit normally available between the offsite transmission network and the onsite AC Electrical Power Distribution System.

2 The HBRSEP design preceded the finalization of most contemporary electrical design standards. Consequentially the term Class 1E is not applied to HBRSEP.

3 Since the HBRSEP design provides one circuit normally available between the offsite transmission network and the onsite AC Electrical Power Distribution System, the ITS completion time for restoring one offsite circuit is 24 hours. The ISTS Required Action (RA) A.2 (ITS RA A.1) completion time to declare the required features inoperable when its associated redundant required feature is inoperable is reduced to 12 hours. This is consistent with the Completion Time for ISTS RA C.1 for two offsite circuits inoperable.

4 The completion time (modified time zero) is modified to reflect the sum of 7 days for an inoperable DG (the Current Licensing Basis (CLB) and 24 hours for an inoperable offsite circuit.

5 The completion time is changed to 12 hours consistent with the operating shift change as approved by the NRC in Amendment 158 to the CTS (3/2/95).

6 Consistent with the CLB, the RA is modified to either require determining the OPERABLE DG is not inoperable to a common cause failure or testing the OPERABLE DG within 24 hours. If a common cause failure of the OPERABLE DG has been found not to be applicable, the testing of the OPERABLE DG may be delayed for up to 96 hours but is still required to be performed once within the 7 days permissible for one inoperable DG.

7 Consistent with the CLB, the completion time for restoring one inoperable DG is 7 days.

8 With only one offsite circuit normally available, some combinations of inoperability of offsite circuits and onsite AC sources are not valid since they result in only one OPERABLE AC source.

9 After a loss of offsite power and irrespective of an accident signal, the HBRSEP design does not provide for automatically transferring the loads back to the offsite circuit. Under this condition the load sequencing circuitry for each emergency bus only affects the ability of the associated DG to power its respective bus. There is no separate OPERABILITY requirement in CTS for the load sequencer. The OPERABILITY of the load sequencer is encompassed within the OPERABILITY requirements

for its associated DG. Appropriate SR requirements for the load sequencer are included in the SRs for the associated DG (SR 3.8.1.8, SR 3.9.1.9, SR 3.8.1.13 and SR 3.8.1.14). Therefore, there is no need for a separate Action for the load sequencing circuitry.

10 A Note is added to Required Action D.1 which permits up to a two hour delay to complete this Required Action during performance of Required Action B.3.1 and Required Action B.3.2.2. The Note is necessary since performance of ITS 3.8.1 RA B.3.1 and B.3.2.2 (i.e., performance of SR 3.8.1.2 for OPERABLE DG) results in rendering the OPERABLE DG inoperable. This deviation is consistent with the CLB (CTS 3.7.2.d.2) which was recently approved as Amendment No. 158 (3/2/95). Without this Note, immediate entry in Action D is required. Consistent with the CLB, entry into the Condition involving two or more AC sources inoperable is delayed for no greater than two hours when performing this testing.

11 The CLB provision for removing the bypass of the DG protective trips after the DG has properly assumed the load on its bus is retained. The DG trips are not automatically bypassed as in a typical plant design. Therefore, these trips are normally manually bypassed. This is CLB for HBRSEP Unit No. 2 (CTS 3.7.2.e). The protective trips for the diesel generators are bypassed in the normal standby condition of the diesel generators to reduce the probability of spurious trips if the diesel generator must provide power in an emergency. The waiving of this requirement during routine running of a diesel generator for test purposes reduces the exposure of the unit to undue risk to damage that might render it inoperable.

12 The variable DG test Frequency requirements are not included per Generic Letter 94-01 and the CLB. The CLB 31 day frequency is retained until it is modified in accordance with 10 CFR 50.59 through implementation of the provisions of the maintenance rule for the DGs, including the applicable regulatory guidance which will provide a program to assure DG performance.

13 Consistent with the CLB, SR 3.8.1.10 is not adopted. The HBRSEP analysis does not assume a complete loss of load with the DG remaining within the specified limits.

14 The HBRSEP design provides for a manual bypass of the DG protective trips. These trips are normally bypassed to preclude the protective trips from disabling the DG. Consistent with the CLB the ISTS Note is not adopted, since verifying the trips are bypassed may be performed with the DG in its normal configuration. Since the bypass feature is manually established, performance of this SR does not render any safety system or component inoperable, does not result in perturbations of the

AC Electrical Power Distribution System and will not challenge or result in an Anticipated Operational Occurrence.

15 A new SR is added to verify the automatic transfer of the emergency bus E1 loads from the unit auxiliary transformer to the startup transformer.

16 The Frequency for SR 3.8.3.1 is changed to 7 days for consistency with the CLB. There are no low level alarms associated with the Unit 1 IC turbine oil storage tank or the combined volume. Without this alarm capability, a 31 day Frequency is not justified.

17 Consistent with the CLB diesel fuel oil for both DGs is stored in a combination of the Unit 2 DG fuel oil storage tank and the Unit 1 IC fuel oil storage tanks. Each DG has its own starting air subsystem.

18 The lube oil requirements are not included in this Specification. The available lube oil level indication for the DGs does not lend itself to an accurate quantification of lube oil inventory in the DG lube oil sump. Based upon lube oil consumption measurements obtained during a recent 24 hour load test of the diesel, the minimum inventory requirements of lube oil have been adjusted to require a 7 day supply be maintained onsite. Thus a sufficient quantity of lube oil is maintained available. There is no CTS or CLB requirement regarding DG lube oil inventory. Amendment No. 174 involving DG requirements was recently approved (9/11/96) without imposing any DG lube oil inventory requirements. The effect of omitting the lube oil requirements is that the DG would be immediately declared inoperable upon discovery of insufficient lube oil, rather than allowing 48 hours to restore the lube oil to its "sufficient" levels. Therefore, the change is more restrictive than the NUREG would provide.

19 Not used.

20 NUREG SR 3.8.4.2 and SR 3.8.4.5 are not adopted. NUREG SR 3.8.4.2 is omitted since visible corrosion does not necessarily mean the battery is inoperable (as indicated in the Bases for NUREG SR 3.8.4.4). NUREG SR 3.8.4.5 is omitted since a specific value for terminal resistance does not indicate the battery is inoperable. The safety analyses do not assume a specific battery resistance value, but typically assume the batteries will supply adequate power. Therefore, the key issue is the overall battery resistance. Between surveillances, the resistance of each connection varies independently from all the others. Some of these connection resistances may be higher or lower than others, and the battery may still be able to perform its function and should not be considered inoperable solely because one connector's resistance is high. This is CLB for HBRSEP Unit No. 2. SR 3.8.4.2 and SR 3.8.4.5 are not adopted since they do not provide a direct indication of battery

OPERABILITY. A battery may indicate visible corrosion and exceed the connection resistance limits and still be OPERABLE. Therefore, the maintenance of these connections is proposed to continue to be controlled in plant procedures. This change is also consistent with TSTF-199, which proposes to eliminate STS SR 3.8.4.2 - SR 3.8.4.5.

21 Consistent with the current licensing basis for battery testing, the battery performance test may be substituted for the battery service test once every 5 years. The provision to use the performance test in lieu of the service test was reviewed and approved in amendment 132, issued 2/7/91. The CLB for HBRSEP Unit No. 2 does not include a requirement for a modified performance test.

Note 1 to ITS SR 3.8.4.5 is modified to state ". . . once per 75 months" to retain current scheduling flexibility with respect to unit refueling intervals. This is consistent with the current licensing basis since the CTS specified frequency of 5 year can be adjusted up to 75 months (60 months + 25%). The intent of the STS SR 3.8.4.7 Note 1 provision is to permit the performance discharge test to be performed in lieu of the required service discharge test. It is not intended that the Note impose a more restrictive frequency than that established by the Frequencies for the service test and the performance test. However as presented in the STS there is no flexibility provided regarding the frequency for use of the performance test in lieu of the discharge test. SR 3.0.2 does not apply since the 60 months stated in the Note is neither a Frequency or a Completion Time. This change provides the same flexibility in scheduling that applies to the associated SRs.

This is CLB for HBRSEP Unit No. 2. The ITS once per 60 month interval for substituting the performance discharge test in lieu of the service test is not an SR Frequency nor a Completion Time. Consequently the 25% interval extension afforded by ITS SR 3.0.2 does not appear to apply to this interval in the SR Note. Consequently, the once per 60 months can be interpreted to require not exceeding the 60 month interval. The 5 year interval for CTS 4.6.3.5 is clearly subject to the 25% interval extension afforded by CTS 4.0. This change is similar to unapproved TSTF-200 which proposes to permit the unrestricted use of a modified performance test in lieu of the service test.

22 The Frequency is revised to specify 18 months which is consistent with the expected fuel cycle length. A Frequency of 12 months may require an additional shutdown to perform the SR (since the test makes the battery inoperable for longer than allowed by the ACTIONS) and a Frequency of 24 months would require either an additional shutdown or performance at the normal 18 month refueling schedule. Therefore, the 18 month frequency which considers the capability to perform the test is substituted.

23 The HBRSEP design utilize inverters to provide AC power for four of the eight 120 V instrument buses. The remaining four 120 V instrument buses are supplied from constant voltage transformers (CVT). The ISTS Inverters specification has been appropriately modified to incorporate the CVTs as comparable AC Instrument Bus supplies. An appropriate Condition with an associated Required Action is provided to address the condition with an inoperable CVT. Appropriate Surveillance Requirements, SR 3.8.7.2 and SR 3.8.8.2, are provided for the CVTs. The constant voltage transformers are not provided with installed instrumentation which provide output voltage. The SRs for CVTs include verification of voltage availability without requiring actual measurement of voltage.

24 The term instrument bus is used in lieu of vital bus.

25 For clarity and consistency with other comparable Conditions as well as the associated bases, the term subsystem was added to the Condition associated with the AC instrument bus inoperable.

26 Consistent with the CLB Conditions and associated Required Actions are added for circuit protection features associated with specified loads. Appropriate Surveillance requirements associated with these circuit protection features are added. The HBRSEP design includes specified components which are powered from both AC power trains by utilization of an Automatic Bus Transfer (ABT). Circuit protection for these loads is necessary to ensure protection from common cause failure of both AC power trains.

27 The HBRSEP design does not provide a generator differential current trip for the DG output breaker. There is no CTS requirement comparable to the suggested requirement. Since the generator differential current protective feature does not exist, it is not appropriate to be included in the SR.

28 ISTS SR 3.8.1.16 requires verification that the DGs can be manually synchronized and then automatically transfer the load from the DG to the offsite source and then return to the "ready to load" state. The STS bases indicates the synchronization is manual but the load transfer is described as an automatic load transfer. The HBRSEP design does not provide such an automatic transfer from the onsite AC source to the offsite AC circuit. This transfer must be accomplished manually. Since this capability is not consistent with plant design or the CLB, the SR is not adopted.

29 For consistency with Condition B and SR 3.8.6.3, LCO 3.8.6 is modified to explicitly include requirements for electrolyte temperature.

30 ITS ST 3.8.3.6 is a preventative type of SR. Sediment in the tank, or failure to perform this SR, does not necessarily result in an inoperable storage tank as stated in the Bases for SR 3.8.3.6. Since there is no CTS requirement and the failure of this SR does not necessarily result in an inoperable DG, inspection of the fuel oil storage tanks is retained under licensee control and ITS 3.8.1.6 is not adopted. This is consistent with the CLB for HBRSEP UNit No. 2. Operating experience coupled with CLB demonstrate the adequacy of current practice to maintain fuel oil quality. Preventative maintenance SRs have generally been relocated from the TS and retained under licensee control. This SR is similar to the DG inspection SR, which has been relocated to plant licensee controlled documents. Performance of ITS SR 3.8.3.2 (fuel oil testing) and the limits of the diesel fuel oil testing program help ensure tank sediment is minimized. Performance of ITS SR 3.8.3.1 (fuel oil volume verification) once per 31 days ensures that any degradation of the tank wall surface that results in a fuel volume reduction is detected and corrected in a timely manner.

31 The Actions of ISTS 3.8.2, "AC Sources - Shutdown", 3.8.5, "DC Sources - Shutdown", 3.8.8, "AC Instrument Bus Sources - Shutdown" and 3.8.10, "Distribution Systems - Shutdown" are modified by a Note stating LCO 3.0.3 is not applicable. When moving fuel assemblies while in MODES 5 and 6, LCO 3.0.3 is not applicable. Movement of fuel assemblies while in MODES 1, 2, 3 and 4 is independent of reactor operations. In either case, requiring a unit shutdown is inconsistent with the applicable safety analyses for the specification. This deviation is also consistent with TSTF-36.

32 The Bases for ISTS SR 3.8.4.3 states that this SR provides an indication of physical damage or abnormal deterioration that could degrade battery performance. Some degradation or physical damage might be identified during performance of this SR which does not degrade battery performance. The presence of physical damage or deterioration does not represent a failure of SR 3.8.4.3 provided an evaluation determines that the physical damage or deterioration does not affect the OPERABILITY of the battery.

33 The HBRSEP design provides two battery chargers for each battery. Consequently, ITS SR 3.8.4.4 can be performed on one charger while the other charger remains connected to the battery.

34 SR 3.8.4.2 and SR 3.8.4.5 are not adopted consistent with the current licensing basis since they do not provide a direct indication of battery OPERABILITY. A battery may indicate visible corrosion and exceed the connection resistance limits and still be OPERABLE. Therefore, the maintenance of these connections is proposed to continue to be controlled in plant procedures. This change is also consistent with

TSTF-199, which proposes to eliminate STS SR 3.8.4.2 - SR 3.8.4.5. Subsequent sections and references to these SRs are appropriately revised.

35 Editorial revision for clarity.

36 SR 3.8.9.1 is modified by adding a NOTE which excludes the AC Vital instrument buses powered from the CVTs from requiring verification of bus voltage since constant voltage transformers are not provided with installed instrumentation which indicate output voltage. For the CVT supplied buses verification of voltage availability is required without requiring actual measurement of voltage. The HBRSEP design provides limited capability to verify bus voltages using installed instrumentation. Verification of bus voltages using portable test instrumentation is not justified due to the increased risk to personnel and the increased potential for a transient resulting from adverse electrical interactions. The verification of proper breaker alignment and voltage availability is sufficient to assure OPERABILITY of the instrument buses supplied by the CVTs.

37 A typical DG may experience load and frequency oscillations prior to reaching steady state operation when the DG is not loaded. This period may extend beyond the 10 second acceptance criteria. The SR is modified to verify the minimum voltage and frequency are achieved within 10 seconds but the maximum limits for voltage and frequency are required to be maintained after achieving steady state operation. The intent of the 10 second DG start tests is to confirm he ability of the DG to reach the minimum condition to accept load. This is consistent with the revised minimum Volt and Hz. The dual voltage and frequency limits are necessary, due to the HBRSEP Unit No. 2 design. The HBRSEP DGs are not designed to accelerate to rated speed and voltage without temporarily exceeding the steady state limits. This change is consistent with TSTF-163 submitted to NRC for approval.

38 Limits on DG fuel oil particulate is not within the scope of the HBRSEP DG fuel oil sampling program. The DG manufacturer does not specify any limits on DG fuel particulate. There is no requirements associated with fuel oil particulate in the HBRSEP CLB. Consequently, the separate condition for fuel oil particulate not within limits is not adopted. The scope of DG fuel oil testing requirements have been previously reviewed and approved by NRC by Amendment No. 124 dated 10/26/89. Operating experience demonstrates the adequacy of current practice coupled with CLB to maintain fuel oil quality.

39 An 18 month frequency is chosen based on engineering judgment which indicates this frequency is sufficient to detect battery and rack degradation on a long term basis.

40 An 18 month frequency is chosen based on engineering judgment taking into consideration the likelihood of a change in component or system status.

41 The HBRSEP design does not include the DG test mode override feature.

42 There is no CLB for the duration of the battery charger surveillance. Additionally, the NUREG does not establish a basis for the bracketed 8 hour duration. A four hour test duration is adopted. Four hours is considered sufficient to permit electronic components within the battery charger to stabilize at operating temperature. This value is also the consensus value recommended by the IEEE Standards Coordination Committee (SCC) 29 for Station batteries during a discussion within the Nuclear Task Force at the recent spring meeting.

43 There is no current licensing basis for the NUREG bracketed value for battery charger current specified for ITS SR 3.8.4.6. The HBRSEP design provides a charger rated at 300 Amps. This value for battery charging current is sufficient to meet design and safety analysis assumptions regarding battery charger current.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.1 AC Sources - Operating

BASES

BACKGROUND

The unit Class 1E AC Electrical Power Distribution System AC sources consist of the offsite power sources (preferred power sources, normal and alternate(s)), and the onsite standby power sources (Train A and Train B diesel generators (DGs)). As required by 10 CFR 50, Appendix A, GDC 17 (Ref. 1), the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems.

The onsite Class 1E AC Distribution System is divided into redundant load groups (trains) so that the loss of any one group does not prevent the minimum safety functions from being performed. Each train has connections to two preferred offsite power sources and a single DG.

Offsite power is supplied to the unit switchyard(s) from the transmission network by two transmission lines. From the switchyard(s), two electrically and physically separated circuits provide AC power, through [step down station auxiliary transformers], to the 4.16 kV ESF buses. A detailed description of the offsite power network and the circuits to the Class 1E ESF buses is found in the FSAR, Chapter [8] (Ref. 2).

An offsite circuit consists of all breakers, transformers, switches, interrupting devices, cabling, and controls required to transmit power from the offsite transmission network to the onsite Class 1E ESF bus(es).

Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the transformer supplying offsite power to the onsite Class 1E Distribution System. Within [1] minute after the initiating signal is received, all automatic and permanently connected loads needed to recover the unit or maintain it in a safe condition are returned to service via the load sequencer.

The onsite standby power source for each 4.16 kV ESF bus is a dedicated DG. DGs 11 and 12 are dedicated to ESF buses 11 and 12 respectively. A DG starts

(continued)

Insert B3.8.1-1

The 480 V ESF bus E2 is normally powered from the 115 kV switchyard through the startup transformer, 4.160 kV bus 3 and station service transformer 2G. The 480 V ESF bus E1 is normally powered from the turbine generator through the unit auxiliary transformer, 4.160 kV buses 1 and 2 and station service transformer 2F. A main generator lockout causes 4.160 kV buses 1 and 2 to be automatically transferred to the startup transformer which results in 480 V ESF bus E1 being supplied from the startup transformer.

Should a failure of the startup transformer occur, a spare startup transformer located onsite can be jumpered into service. During the time that the startup transformer is out of service, the unit auxiliary transformer is capable of supplying power to the onsite distribution system while powered from the turbine generator or by back-feeding the main transformer from the 230 kV switchyard. The unit auxiliary transformer powered from the turbine generator is not a qualified offsite circuit. Prior to back-feeding the main transformer from the 230 kV switchyard, the generator must be disconnected from the main transformer by removing the connecting straps. The main transformer backfeeding will only be done during MODES 5 or 6 unless nuclear safety considerations require it to be done during MODES 2 or 3 (in accordance with applicable Required Actions) when no other offsite power sources are available.

BASES

① ②

e.g.

BACKGROUND (continued)

automatically on a safety injection (SI) signal (i.e., low pressurizer pressure or high containment pressure signals) or on an [ESF bus degraded voltage or undervoltage signal] (refer to LCO 3.3.5, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation"). After the DG has started, it will automatically tie to its respective bus after offsite power is tripped as a consequence of ESF bus undervoltage or degraded voltage, independent of or coincident with an SI signal. The DGs will also start and operate in the standby mode without tying to the ESF bus on an SI signal alone. Following the trip of offsite power, [a sequencer] an undervoltage signal strips nonpermanent loads from the ESF bus. When the DG is tied to the ESF bus, loads are then sequentially connected to its respective ESF bus by the automatic load sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading the DG by automatic load application.

In the event of a the loss of preferred power, the ESF electrical loads are automatically connected to the DGs in sufficient time to provide for safe reactor shutdown and to mitigate the consequences of a Design Basis Accident (DBA) such as a loss of coolant accident (LOCA).

Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the DG in the process. Within [1] minute after the initiating signal is received, all loads needed to recover the unit or maintain it in a safe condition are returned to service.

⑦

~~Ratings for Train A and Train B DGs satisfy the requirements of Regulatory Guide 1.9 (Ref. 3).~~ The continuous service rating of each DG is [7000] kW with [10]% overload permissible for up to 2 hours in any 24 hour period. The ESF loads that are powered from the [4.16] kV ESF buses are listed in Reference 2.

2500

480

⑥

① Operation above the continuous service rating for longer than that time period is not allowed. Additionally, operation above the short term overload limit (2575 KW) is not allowed.

APPLICABLE SAFETY ANALYSES

④

The initial conditions of DBA and transient analyses in the FSAR, Chapter [6] (Ref. 4) and Chapter [15] (Ref. 5), assume ESF systems are OPERABLE. The AC electrical power sources are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System (RCS), and containment design limits are not

(continued)

Supplement 4

①

BASES

LCO (continued)

• Bus A, and is fed through breaker PA 0201, powering the ESF transformer, which, in turn, powers the #2 ESF bus through its normal feeder breaker.

Each emergency DG must be capable of starting, accelerating to rated speed and voltage within the tolerances specified in the associated surveillances and connecting to its respective ESF bus on detection of bus undervoltage. This will be accomplished within [10] seconds. Each DG must also be capable of accepting required loads within the assumed loading sequence intervals, and continue to operate until offsite power can be restored to the ESF buses. These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot and DG in standby with the engine at ambient conditions. Additional DG capabilities must be demonstrated to meet required Surveillance, e.g., capability of the DG to revert to standby status on an ECCS signal while operating in parallel test mode. ⑨

Insert B3.8.1-12 ①

Proper sequencing of loads, [including tripping of nonessential loads,] is a required function for DG OPERABILITY.

The AC sources in one train must be are separate and independent (to the extent possible) of the AC sources in the other train. For the DGs, separation and independence are complete.

③

For the offsite AC sources, separation and independence are to the extent practical. A circuit may be connected to more than one ESF bus, with fast transfer capability to the other circuit OPERABLE, and not violate separation criteria. A circuit that is not connected to an ESF bus is required to have OPERABLE fast transfer interlock mechanisms to at least two ESF buses to support OPERABILITY of that circuit.

APPLICABILITY

The AC sources [and sequencers] are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that: ⑩

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

(continued)

Supplement 4

Insert B3.8.1-12

Additionally, for a DG to be considered OPERABLE, the following protective trips must be bypassed to prevent a governor shutdown:

a. Low lube oil pressure,
b. Low coolant pressure,
c. High coolant temperature,
d. High crankcase pressure, and
e. Start failure - governor shutdown.

(1)

BASES

APPLICABILITY (continued)

b. Adequate core cooling is provided and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

The AC power requirements for MODES 5 and 6 are covered in LCO 3.8.2, "AC Sources - Shutdown." and During Movement of Irradiated Fuel Assemblies (10)

ACTIONS

A.1 (10)

To ensure a highly reliable power source remains with one offsite circuit inoperable, it is necessary to verify the OPERABILITY of the remaining required offsite circuit on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action not met. However, if a second required circuit fails SR 3.8.1.1, the second offsite circuit is inoperable, and Condition C, for two offsite circuits inoperable, is entered.

[Reviewer's Note: The turbine driven auxiliary feedwater pump is only required to be considered a redundant required feature, and, therefore, required to be determined OPERABLE by this Required Action, if the design is such that the remaining OPERABLE motor or turbine driven auxiliary feedwater pump(s) is not by itself capable (without any reliance on the motor driven auxiliary feedwater pump powered by the emergency bus associated with the inoperable diesel generator) of providing 100% of the auxiliary feedwater flow assumed in the safety analysis.]

A.2 (1)

Required Action A.2 (1) which only applies if the train cannot be powered from an offsite source, is intended to provide assurance that an event coincident with a single failure of the associated DG will not result in a complete loss of safety function of critical redundant required features. These features are powered from the redundant AC electrical power train. This includes motor driven auxiliary feedwater pumps. Single train systems, such as turbine driven auxiliary feedwater pumps, may not be included.

INsert B 3.8-5A (10)

(continued)

Supplement 4

Insert B3.8-5a

The Completion Time for inoperability of the offsite source is 12 hours. The rationale for the 12 hours is that Regulatory Guide 1.93 (Ref. 10) allows a Completion Time of 24 hours for two required offsite circuits inoperable when two offsite sources are incorporated into the design, based upon the assumption that two complete safety trains are OPERABLE. When no offsite sources are OPERABLE, this assumption is not the case, and a shorter Completion Time of 12 hours is appropriate.

Insert B3.8.1-4

The minimum voltage and frequency stated in the SR are those necessary to ensure the DG can accept DBA loading while maintaining acceptable voltage and frequency levels. Stable operation at the nominal voltage and frequency values is also essential to establishing DG OPERABILITY, but a time constraint is not imposed. This is because a typical DG will experience a period of voltage and frequency oscillations prior to reaching steady state operation if these oscillations are not damped out by load application. This period may extend beyond the 10 second acceptance criteria and could be a cause for failing the SR. In lieu of a time constraint in the SR. HBRSEP Unit No. 2 will monitor and trend the actual time to reach steady state operation as a means of assuring there is no voltage regulator or governor degradation which could cause a DG to become inoperable.

(1)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.6 (continued) The Frequency of 31 days for this SR is based on

[Section XI (Ref. 11); however, the design of fuel transfer systems is such that pumps operate automatically or must be started manually in order to maintain an adequate volume of fuel oil in the day [and engine mounted] tanks during or following DG testing. In such a case, a 31 day Frequency is appropriate. Since proper operation of fuel transfer systems is an inherent part of DG OPERABILITY, the Frequency of this SR should be modified to reflect individual designs.]

SR 3.8.1.7

See SR 3.8.1.2.

(10)

[SR 3.8.1.8

Transfer of each [4.16 kV ESF bus] power supply from the normal offsite circuit to the alternate offsite circuit demonstrates the OPERABILITY of the alternate circuit distribution network to power the shutdown loads. The [18 month] Frequency of the Surveillance is based on engineering judgment, taking into consideration the unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the [18 month] Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by a Note. The reason for the Note is that, during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. Credit may be taken for unplanned events that satisfy this SR.]

SR 3.8.1.9 (8)

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine

(continued)

Supplement 4

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the DG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency and while maintaining a specified margin to the overspeed trip. [For this unit, the single load for each DG and its horsepower rating is as follows:] This Surveillance may be accomplished by:

is a Safety Injection pump rated at 380 Brake Horsepower.

a. Tripping the DG output breaker with the DG carrying greater than or equal to its associated single largest post-accident load while paralleled to offsite power, or while solely supplying the bus; or

b. Tripping its associated single largest post-accident load with the DG solely supplying the bus.

As required by IEEE-308 (Ref. 9), the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint, or 15% above synchronous speed, whichever is lower.

The time, voltage, and frequency tolerances specified in this SR are derived from Regulatory Guide 1.9 (Ref. 7) recommendations for response during load sequence intervals. The 3 seconds specified is equal to 60% of a typical 5 second load sequence interval associated with sequencing of the largest load. The voltage and frequency specified are consistent with the design range of the equipment powered by the DG. SR 3.8.1.9.a corresponds to the maximum frequency excursion, while SR 3.8.1.9.b and SR 3.8.1.9.c are steady state voltage and frequency values to which the system must recover following load rejection. The [18 month] Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 8).

This SR is modified by two Notes. The reason for Note 1 is that during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. Credit may be taken for unplanned events that satisfy this SR. In order to ensure that the DG is tested under load

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(continued)

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BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

conditions that are as close to design basis conditions as possible. Note 2 requires that, if synchronized to offsite power, testing must be performed using a power factor ≤ [0.9]. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience.

Reviewer's Note: The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:

a. Performance of the SR will not render any safety system or component inoperable;

b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems; and

c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.

SR 3.8.1.10

This Surveillance demonstrates the DG capability to reject a full load without overspeed tripping or exceeding the predetermined voltage limits. The DG full load rejection may occur because of a system fault or inadvertent breaker tripping. This Surveillance ensures proper engine generator load response under the simulated test conditions. This test simulates the loss of the total connected load that the DG experiences following a full load rejection and verifies that the DG does not trip upon loss of the load. These acceptance criteria provide for DG damage protection. While the DG is not expected to experience this transient during an event and continues to be available, this response ensures that the DG is not degraded for future application, including reconnection to the bus if the trip initiator can be corrected or isolated.

(continued)

Supplement 4

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.10 (continued)

In order to ensure that the DG is tested under load conditions that are as close to design basis conditions as possible, testing must be performed using a power factor ≤ [0.9]. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience.

The [18 month] Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 9) and is intended to be consistent with expected fuel cycle lengths.

This SR has been modified by a Note. The reason for the Note is that during operation with the reactor critical, performance of this SR could cause perturbation to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. Credit may be taken for unplanned events that satisfy this SR.

[Reviewer's Note: The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:

a. Performance of the SR will not render any safety system or component inoperable;

b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems; and

c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.]

SR 3.8.1.11

As required by Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(1), this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions

(continued)

Supplement 4

(1)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.(N) (9) (continued)

encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time.

The DG autostart time of [10] seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability is achieved.

The requirement to verify the connection and power supply of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, Emergency Core Cooling Systems (ECCS) injection valves are not desired (required) to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or residual heat removal (RHR) systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG systems to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of [18 months] ~~is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(1),~~ (14) takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. (15)

This SR is modified by ~~two~~ (three) Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained

(continued

Supplement 4

1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.11 9 (continued)

consistent with manufacturer recommendations. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. ~~Credit may be taken for unplanned events that satisfy this SR.~~ Insert B3.8.1-6 10 TSTF-8, Rev. 2

SR 3.8.1.12 10

This Surveillance demonstrates that the DG automatically starts and achieves the required voltage and frequency within the specified time [10] seconds) from the design basis actuation signal (LOCA signal) and operates for ≥ 5 minutes. The 5 minute period provides sufficient time to demonstrate stability. SR 3.8.1.12.d and SR 3.8.1.12.e ensure that permanently connected loads and emergency loads are energized from the offsite electrical power system on an ESF signal without loss of offsite power. Insert B3.8.1-6A 10

The requirement to verify the connection of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, ECCS injection valves are not ~~desired~~ required to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or RHR systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of [18 months] takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with the expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the [18 month] Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

(continued)

Insert B3.8.1-6

Note 3 to this SR permits removal of the bypass for protective trips after the DG has properly assumed its loads on the bus. This reduces exposure of the DG to undue risk of damage that might render it inoperable.

Insert B3.8.1-6A

Stable operation at the nominal voltage and frequency values is also essential to establishing DG OPERABILITY, but a time constraint is not imposed. This is because a typical DG will experience a period of voltage and frequency oscillations prior to reaching steady state operation if these oscillations are not damped out by load application. This period may extend beyond the 10 second acceptance criteria and could be a cause for failing the SR. In lieu of a time constraint in the SR. HBRSEP Unit No. 2 will monitor and trend the actual time to reach steady state operation as a means of assuring there is no voltage regulator or governor degradation which could cause a DG to become inoperable.

(1)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.12 (continued) 10

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 is that during operation with the reactor critical, performance of this Surveillance could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. Credit may be taken for unplanned events that satisfy this SR.

TSTF-8, Rev. 2

Insert B 3.8.1-7 (9)

SR 3.8.1.13 (11)

This Surveillance demonstrates that DG noncritical protective functions (e.g., high jacket water temperature) are bypassed on a loss of voltage signal concurrent with an ESF actuation test signal, and critical protective functions (engine overspeed, generator differential current, low lube oil pressure, high crankcase pressure, and start failure relay) trip the DG to avert substantial damage to the DG unit. The noncritical trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG.

(15) coolant (10) (15) Normally

A manual switch is provided which bypasses the non-critical trips.

(26)

The [18 month] Frequency is based on engineering judgment, taking into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the [18 month] Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

(10)

The SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required DG from service. Credit may be taken for unplanned events that satisfy this SR.

This SR is satisfied by simulating a trip signal to each of the noncritical trip devices + observing the DG does not receive a trip signal.

(1)

(continued)

Supplement 1

Supplement 4

1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.13 11 (continued)

[Reviewer's Note: The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:

a. Performance of the SR will not render any safety system or component inoperable;

b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems; and

c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.]

SR 3.8.1.14 12

1 The DG start shall be a manually initiated start followed by manual synchronization with other power sources. Additionally

This SR 14

Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(3), requires demonstration once per 18 months that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours, ≥ [2] 1.75 hours of which is at a load equivalent to 110% of the continuous duty rating and the remainder of the time at a load equivalent to the continuous duty rating of the DG. The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelubricating and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR.

In order to ensure that the DG is tested under load conditions that are as close to design conditions as possible, testing must be performed using a power factor of ≤ [0.9]. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

(continued)

Supplement 4

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.12 (continued)

The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(5), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This Surveillance is modified by three Notes. Note 1 states that momentary transients due to changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the power factor limit will not invalidate the test. The reason for Note 2 is that during operation with the reactor critical, performance of this Surveillance could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. Credit may be taken for unplanned events that satisfy this SR. [Insert B 3.8.1-8A] [TSTF-8, Rev. 2]

SR 3.8.1.13

This Surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve the required voltage and frequency within 10 seconds. The 10 second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA. The 18 month Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(5). [based on engineering judgment & is intended to be consistent with expected fuel cycle lengths.]

This SR is modified by two Notes. Note 1 ensures that the test is performed with the diesel sufficiently hot. The load band is provided to avoid routine overloading of the DG. Routine overloads may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. The requirement that the diesel has operated for at least 2 hours at full load conditions prior to performance of this Surveillance is based on manufacturer recommendations for achieving hot conditions. Momentary transients due to changing bus loads do not invalidate this test. Note 2 allows all DG starts to be preceded by an engine prelube period to minimize wear and tear on the diesel during testing.

(continued)

Supplement 1

Supplement 4

Insert B3.8.1-8A

Note 3 to this SR permits removal of the bypass for protective trips after the DG has properly assumed its load on the bus. This reduces exposure of the DG to undue risk of damage that might render in inoperable.

Insert B3.8.1-8

Stable operation at the nominal voltage and frequency values is also essential to establishing DG OPERABILITY, but a time constraint is not imposed. This is because a typical DG will experience a period of voltage and frequency oscillations prior to reaching steady state operation if these oscillations are not damped out by load application. This period may extend beyond the 10 second acceptance criteria and could be a cause for failing the SR. HBRSEP Unit No. 2 will monitor and trend the actual time to reach steady state operation as a means of assuring there is no voltage regulator or governor degradation which could cause a DG to become inoperable.

1 10

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.17 (continued)

This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(8), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.18 14

Under accident [and loss of offsite power] conditions loads are sequentially connected to the bus by the [automatic load sequencer]. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. The [10%] load sequence time interval tolerance ensures that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated. Reference 2 provides a summary of the automatic loading of ESF buses.

0.4 second

The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(2), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

14

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. Credit may be taken for unplanned events that satisfy this SR.

TSTF-8, Rev. 2

(continued)

Supplement 4

1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.18 (continued)

[Reviewer's Note: The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:

a. Performance of the SR will not render any safety system or component inoperable;

b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems; and

c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.]

SR 3.8.1.19 15

In the event of a DBA coincident with a loss of offsite power, the DGs are required to supply the necessary power to ESF systems so that the fuel, RCS, and containment design limits are not exceeded.

This Surveillance demonstrates the DG operation, as discussed in the Bases for SR 3.8.1.11 during a loss of offsite power actuation test signal in conjunction with an ESF actuation signal. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of [18 months] takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with an expected fuel cycle length of [18 months]. 10

This SR is modified by two three Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For

(continued)

Supplement 4

(1)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.19 (15) (continued)

the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations for DGs. The reason for Note 2 is that the performance of the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. Credit may be taken for unplanned events that satisfy this SR.

TSTF-8, Rev 2

(10) Insert B3.8.1-9

SR 3.8.1.20 (17)

(10) Insert B3.8.1-10

This Surveillance demonstrates that the DG starting independence has not been compromised. Also, this Surveillance demonstrates that each engine can achieve proper speed within the specified time when the DGs are started simultaneously.

(10) Insert B3.8.1-10A

(14) based on engineering judgement

The 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9).

This SR is modified by a Note. The reason for the Note is to minimize wear on the DG during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations.

(10)

Diesel Generator Test Schedule

The DG test schedule (Table 3.8.1-1) implements the recommendations of Revision 3 to Regulatory Guide 1.9 (Ref. 3). The purpose of this test schedule is to provide timely test data to establish a confidence level associated with the goal to maintain DG reliability > 0.95 per demand.

According to Regulatory Guide 1.9, Revision 3 (Ref. 3), each DG should be tested at least once every 31 days. Whenever a DG has experienced 4 or more valid failures in the last 25 valid tests, the maximum time between tests is reduced to 7 days. Four failures in 25 valid tests is a failure rate of 0.16, or the threshold of acceptable DG performance, and

(continued)

Supplement 1

Supplement 4

Insert B3.8.1-9

Note 3 to this SR permits removal of the bypass for protective trips after the DG has properly assumed its loads on the bus. This reduces exposure of the DG to undue risk of damage that might render it inoperable.

Insert B3.8.1.10

SR 3.8.1.16

Transfer of the 4.160 kV bus 2 power supply from the auxiliary transformer to the start up transformer demonstrates the OPERABILITY of the offsite circuit network to power the shutdown loads. In lieu of actually initiating a circuit transfer, testing that adequately shows the capability of the transfer is acceptable. This transfer testing may include any sequence of sequential, overlapping, or total steps so that the entire transfer sequence is verified. The 18 month Frequency is based on engineering judgement taking into consideration the plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle length.

This SR is modified by two Notes. The reason for Note 1 is that, during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. Credit may be taken for unplanned events that satisfy this SR. As stated in Note 2, automatic transfer capability to the SUT is not required to be met when the associated 4.160 kV bus and Emergency Bus are powered from the SAT. This is acceptable since the automatic transfer capability function has been satisfied in this condition.

TSTF-8 Rev. 2

Insert B3.8.1-10A

Stable operation at the nominal voltage and frequency values is also essential to establishing DG OPERABILITY, but a time constraint is not imposed. This is because a typical DG will experience a period of voltage and frequency oscillations prior to reaching steady state operation if these oscillations are not damped out by load application. This period may extend beyond the 10 second acceptance criteria and could be a cause for failing the SR. HBRSEP Unit No. 2 will monitor and trend the actual time to reach steady state operation as a means of assuring there is no voltage regulator or governor degradation which could cause a DG to become inoperable.

(1)

BASES

REFERENCES (continued)

8. Regulatory Guide 1.108, Rev. 1, August 1977.
10. 6. Regulatory Guide 1.137, Rev. ~~[1]~~ 1, ~~[date]~~ October 1979.
11. 7. ~~ASME, Boiler and Pressure Vessel Code, Section XI.~~ Regulatory Guide 1.9, Rev. 3, July 1993.
12. 9. IEEE Standard 308-1978.

10. Regulatory Guide 1.93, Rev. 0, December, 1974

Supplement 4

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.2 AC Sources – Shutdown

BASES

BACKGROUND

A description of the AC sources is provided in the Bases for LCO 3.8.1, "AC Sources – Operating."

APPLICABLE SAFETY ANALYSES

The OPERABILITY of the minimum AC sources during MODES 5 and 6 and during movement of irradiated fuel assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate AC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many Design Basis Accidents (DBAs) that are analyzed in MODES 1, 2, 3, and 4 have no specific analyses in MODES 5 and 6. Worst case bounding events are deemed not credible in MODES 5 and 6 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

During MODES 1, 2, 3, and 4, various deviations from the analysis assumptions and design requirements are allowed

(continued)

Supplement 4

1

BASES

APPLICABLE SAFETY ANALYSES (continued)

within the Required Actions. This allowance is in recognition that certain testing and maintenance activities must be conducted provided an acceptable level of risk is not exceeded. During MODES 5 and 6, performance of a significant number of required testing and maintenance activities is also required. In MODES 5 and 6, the activities are generally planned and administratively controlled. Relaxations from MODE 1, 2, 3, and 4 LCO requirements are acceptable during shutdown modes based on:

a. The fact that time in an outage is limited. This is a risk prudent goal as well as a utility economic consideration.

b. Requiring appropriate compensatory measures for certain conditions. These may include administrative controls, reliance on systems that do not necessarily meet typical design requirements applied to systems credited in operating MODE analyses, or both.

c. Prudent utility consideration of the risk associated with multiple activities that could affect multiple systems.

d. Maintaining, to the extent practical, the ability to perform required functions (even if not meeting MODE 1, 2, 3, and 4 OPERABILITY requirements) with systems assumed to function during an event.

In the event of an accident during shutdown, this LCO ensures the capability to support systems necessary to avoid immediate difficulty, assuming either a loss of all offsite power or a loss of all onsite diesel generator (DG) power.

The AC sources satisfy Criterion 3 of the NRC Policy Statement.

LCO

2

One offsite circuit capable of supplying the onsite Class 1E power distribution subsystem(s) of LCO 3.8.10, "Distribution Systems – Shutdown," ensures that all required loads are powered from offsite power. An OPERABLE DG, associated with the distribution system train required to be OPERABLE by LCO 3.8.10, ensures a diverse power source is available to

(continued

Supplement 4

1

BASES

53

LCO (continued)

provide electrical power support, assuming a loss of the offsite circuit. Together, OPERABILITY of the required offsite circuit and DG ensures the availability of sufficient AC sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

The qualified offsite circuit must be capable of maintaining rated frequency and voltage within limits and accepting required loads during an accident, while connected to the Engineered Safety Feature (ESF) bus(es). Qualified offsite circuits are those that are described in the USAR FSAR and are part of the licensing basis for the unit.

In MODES 5+6, the Unit Auxiliary transformer backfed through the unit main transformer can be utilized as a portion of the qualified offsite circuit.

[Offsite circuit #1 consists of Safeguards Transformer B, which is supplied from Switchyard Bus B, and is fed through breaker 52-3 powering the ESF transformer XNB01, which, in turn, powers the #1 ESF bus through its normal feeder breaker. The second offsite circuit consists of the Startup Transformer, which is normally fed from the Switchyard Bus A, and is fed through breaker PA 0201 powering the ESF transformer, which, in turn, powers the #2 ESF bus through its normal feeder breaker.]

The DG must be capable of starting, accelerating to rated speed and voltage, and connecting to its respective ESF bus on detection of bus undervoltage. This sequence must be accomplished within [10] seconds. The DG must be capable of accepting required loads within the assumed loading sequence intervals, and continue to operate until offsite power can be restored to the ESF buses. These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot and DG in standby at ambient conditions.

Proper sequencing of loads, including tripping of nonessential loads, is a required function for DG OPERABILITY.

[In addition, proper sequencer operation is an integral part of offsite circuit OPERABILITY since its inoperability impacts on the ability to start and maintain energized loads required OPERABLE by LCO 3.8.10.]

(continued)

Supplement 4

1

BASES

LCO (continued)

It is acceptable for trains to be cross tied during shutdown conditions, allowing a single offsite power circuit to supply all required trains.

3

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.1.

ACTIONS

Insert B 3.8.2-1 10

A.1

An offsite circuit would be considered inoperable if it were not available to one required ESF train. Although two trains are required by LCO 3.8.10, the one train with offsite power available may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and fuel movement. By the allowance of the option to declare required features inoperable, with no offsite power available, appropriate restrictions will be implemented in accordance with the affected required features LCO's ACTIONS.

(continued)

Supplement L

BASES

ACTIONS (continued)

A.2.1, A.2.2, A.2.3, A.2.4, B.1, B.2, B.3, and B.4

With the offsite circuit not available to all required trains, the option would still exist to declare all required features inoperable. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made. With the required DG inoperable, the minimum required diversity of AC power sources is not available. It is, therefore, required to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions. The Required Action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory provided the required SDM is maintained.

Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability or the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC sources and to continue this action until restoration is accomplished in order to provide the necessary AC power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required AC electrical power sources should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

Pursuant to LCO 3.0.6, the Distribution System's ACTIONS would not be entered even if all AC sources to it are inoperable, resulting in de-energization. Therefore, the Required Actions of Condition A are modified by a Note to indicate that when Condition A is entered with no AC power to any required ESF bus, the ACTIONS for LCO 3.8.10 must be immediately entered. This Note allows Condition A to provide requirements for the loss of the offsite circuit, whether or not a train is de-energized. LCO 3.8.10 would provide the appropriate restrictions for the situation involving a de-energized train.

(continued)

Supplement 4

(1)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.2.1

(15)

SR 3.8.2.1 requires the SRs from LCO 3.8.1 that are necessary for ensuring the OPERABILITY of the AC sources in other than MODES 1, 2, 3, and 4. SR 3.8.1.8 is not required to be met since only one offsite circuit is required to be OPERABLE. SR 3.8.1.17 is not required to be met because the required OPERABLE DG(s) is not required to undergo periods of being synchronized to the offsite circuit. SR 3.8.1.20 is excepted because starting independence is not required with the DG(s) that is not required to be operable. (10) (16)

This SR is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DG(s) from being paralleled with the offsite power network or otherwise rendered inoperable during performance of SRs, and to preclude deenergizing a required 4160 V ESF bus or disconnecting a required offsite circuit during performance of SRs. With limited AC sources available, a single event could compromise both the required circuit and the DG. It is the intent that these SRs must still be capable of being met, but actual performance is not required during periods when the DG and offsite circuit is required to be OPERABLE. Refer to the corresponding Bases for LCO 3.8.1 for a discussion of each SR.

minimize the frequency of

480

REFERENCES

None.

Supplement 4

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.3 Diesel Fuel Oil, Lube Oil, and Starting Air

BASES

BACKGROUND

Each diesel generator (DG) is provided with a storage tank having a fuel oil capacity sufficient to operate that diesel for a period of 7 days while the DG is supplying maximum post loss of coolant accident load demand discussed in the FSAR, Section [9.5.4.2] (Ref. 1). The maximum load demand is calculated using the assumption that a minimum of any two DGs is available. This onsite fuel oil capacity is sufficient to operate the DGs for longer than the time to replenish the onsite supply from outside sources.

Fuel oil is transferred from storage tank to day tank by either of two transfer pumps associated with each storage tank. Redundancy of pumps and piping precludes the failure of one pump, or the rupture of any pipe, valve or tank to result in the loss of more than one DG. All outside tanks, pumps, and piping are located underground.

For proper operation of the standby DGs, it is necessary to ensure the proper quality of the fuel oil. Regulatory Guide 1.137 (Ref. 2) addresses the recommended fuel oil practices as supplemented by ANSI N195 (Ref. 3). The fuel oil properties governed by these SRs are the water and sediment content, the kinematic viscosity, specific gravity (or API gravity), and impurity level.

The DG lubrication system is designed to provide sufficient lubrication to permit proper operation of its associated DG under all loading conditions. The system is required to circulate the lube oil to the diesel engine working surfaces and to remove excess heat generated by friction during operation. Each engine oil sump contains an inventory capable of supporting a minimum of [7] days of operation. [The onsite storage in addition to the engine oil sump is sufficient to ensure 7 days of continuous operation.] This supply is sufficient to allow the operator to replenish lube oil from outside sources.

Each DG has an air start system with adequate capacity for five successive start attempts on the DG without recharging the air start receiver(s).

(continued)

BASES

ACTIONS

B.1 (continued)

restoration of the required volume prior to declaring the DG inoperable. This period is acceptable based on the remaining capacity (> 6 days), the low rate of usage, the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period.

C.1

This Condition is entered as a result of a failure to meet the acceptance criterion of SR 3.8.3.5. Normally, trending of particulate levels allows sufficient time to correct high particulate levels prior to reaching the limit of acceptability. Poor sample procedures (bottom sampling), contaminated sampling equipment, and errors in laboratory analysis can produce failures that do not follow a trend. Since the presence of particulates does not mean failure of the fuel oil to burn properly in the diesel engine, and particulate concentration is unlikely to change significantly between Surveillance Frequency intervals, and proper engine performance has been recently demonstrated (within 31 days), it is prudent to allow a brief period prior to declaring the associated DG inoperable. The 7 day Completion Time allows for further evaluation, resampling and re-analysis of the DG fuel oil.

D.1

With the new fuel oil properties defined in the Bases for SR 3.8.3.3 not within the required limits, a period of 30 days is allowed for restoring the stored fuel oil properties. This period provides sufficient time to test the stored fuel oil to determine that the new fuel oil, when mixed with previously stored fuel oil, remains acceptable, or to restore the stored fuel oil properties. This restoration may involve feed and bleed procedures, filtering, or combinations of these procedures. Even if a DG start and load was required during this time interval and the fuel oil properties were outside limits, there is a high likelihood that the DG would still be capable of performing its intended function.

(continued)

Supplement 4

BASES

ACTIONS (continued)

D.1

With starting air receiver pressure < [225] psig, sufficient capacity for five successive DG start attempts does not exist. However, as long as the receiver pressure is > [125] psig, there is adequate capacity for at least one start attempt, and the DG can be considered OPERABLE while the air receiver pressure is restored to the required limit. A period of 48 hours is considered sufficient to complete restoration to the required pressure prior to declaring the DG inoperable. This period is acceptable based on the remaining air start capacity, the fact that most DG starts are accomplished on the first attempt, and the low probability of an event during this brief period.

E.1

With a Required Action and associated Completion Time not met, or one or more DG's fuel oil, lube oil, or starting air subsystem not within limits for reasons other than addressed by Conditions A through D, the associated DG may be incapable of performing its intended function and must be immediately declared inoperable.

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1

This SR provides verification that there is an adequate inventory of fuel oil in the storage tanks to support each DG's operation for 7 days at full load. The 7 day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an offsite location.

The 31 day Frequency is adequate to ensure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.

SR 3.8.3.2

This Surveillance ensures that sufficient lube oil inventory is available to support at least 7 days of full load

(continued)

Supplement 4

(1)

BASES

SURVEILLANCE REQUIREMENTS

(1)
(API or Specific Gravity, cloud point, Water and sediment, and Viscosity)

SR 3.8.3.2 (continued)

operation for each DG. The [500] gal requirement is based on the DG manufacturer consumption values for the run time of the DG. Implicit in this SR is the requirement to verify the capability to transfer the lube oil from its storage location to the DG, when the DG lube oil sump does not hold adequate inventory for 7 days of full load operation without the level reaching the manufacturer recommended minimum level.

A 31 day Frequency is adequate to ensure that a sufficient lube oil supply is onsite, since DG starts and run time are closely monitored by the unit staff.

(2) in the Diesel Fuel Oil Testing Program

SR 3.8.3.3

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. (19) These tests are to be conducted prior to adding the new fuel to the storage tank(s), but in no case is the time between receipt of new fuel and conducting the tests to exceed 31 days. The tests, limits, and applicable ASTM Standards are as follows:

is acceptable for use.

a. Sample the new fuel oil in accordance with ASTM D4057-[ ] (Ref. 6);

b. Verify in accordance with the tests specified in ASTM D975-[ ] (Ref. 6) that the sample has an absolute specific gravity at 60/60°F of ≥ 0.83 and ≤ 0.89 or an API gravity at 60°F of ≥ 27° and ≤ 39°, a kinematic viscosity at 40°C of ≥ 1.9 centistokes and ≤ 4.1 centistokes, and a flash point of ≥ 125°F; and

c. Verify that the new fuel oil has a clear and bright appearance with proper color when tested in accordance with ASTM D4176-[ ] (Ref. 6).

INSERT B 3.8.3-2 (19, 21, 22)

(continued)

Supplement 4

Insert B3.8.3-2 (SR 3.8.3.2)

New fuel oil received for storage in the Unit 1 I-C turbine fuel oil storage tank and subsequently transferred to the Unit 2 DG fuel oil storage tank is verified to meet the limits below prior to adding to the Unit 1 I-C storage tanks either by verifying the integrity of the seal on the tank truck against the certificate of compliance or by testing of the fuel oil on the truck prior to transfer. Additionally, stored fuel in the Unit 1 I-C storage tank and in the Unit 2 DG fuel oil storage tank is tested every 31 days. The sampling methodology, tests, and limits are as follows: 19

a. Sampling of three vertical IC Turbine tanks is performed as a single entity by recirculating the tanks and sampling at the Unit 1 transfer pump discharge. Sampling of the remaining vertical Unit 1 tank is performed independently from the bottom drain connection. Sampling of the Unit 2 DG fuel oil storage tank is performed from the discharge from the fuel oil storage tank transfer pump (Ref.3); and 21

b. Verify in accordance with applicable ASTM standards that the sample has an API gravity of ≥ 28, a Saybolt viscosity at 100°F of ≥ 32 SUS and ≤ 50 SUS, water and sediment ≤ 0.10%, and cloud point ≤ 23°F. 22

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BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.3.6

Draining of the fuel oil stored in the supply tanks, removal of accumulated sediment, and tank cleaning are required at 10 year intervals by Regulatory Guide 1.137 (Ref. 2), paragraph 2.f. This SR also requires the performance of the ASME Code, Section XI (Ref. 8), examinations of the tanks. To preclude the introduction of surfactants in the fuel oil system, the cleaning should be accomplished using sodium hypochlorite solutions, or their equivalent, rather than soap or detergents. This SR is for preventive maintenance. The presence of sediment does not necessarily represent a failure of this SR, provided that accumulated sediment is removed during performance of the Surveillance. (10)

REFERENCES

1. FSAR, Section [9.5.4.2].
2. Regulatory Guide 1.137.
3. ANSI N195-1976, Appendix B.
(1) → 4. [U]FSAR, Chapter [6].
(2) → 5. [U]FSAR, Chapter [15].
(3) → 6. ASTM Standards: D4057-[ ]; D975-[ ]; D4176-[ ]; D1552-[ ]; D2622-[ ]; D2276, Method A.
7. ASTM Standards, D975, Table 1.
8. ASME, Boiler and Presser Vessel Code, Section XI.

(54)

(4) CP&L Letter to NRC dated November 20, 1981, "Quality Assurance Requirements Regarding Diesel Generator Fuel Oil."

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.4 DC Sources - Operating

BASES

BACKGROUND

The station DC electrical power system provides the AC emergency power system with control power. It also provides both motive and control power to selected safety related equipment and preferred AC vital bus power (via inverters). As required by 10 CFR 50, Appendix A, GDC 17 (Ref. 1), the DC electrical power system is designed to have sufficient independence, redundancy, and testability to perform its safety functions, assuming a single failure. The DC electrical power system also conforms to the recommendations of Regulatory Guide 1.6 (Ref. 2) and IEEE-308 (Ref. 3).

The [125/250] VDC electrical power system consists of two independent and redundant safety related Class 1E DC electrical power subsystems ([Train A and Train B]). Each subsystem consists of [two] 125 VDC batteries [(each battery [50]% capacity)], the associated battery charger(s) for each battery, and all the associated control equipment and interconnecting cabling.

[The 250 VDC source is obtained by use of the two 125 VDC batteries connected in series. Additionally there is [one] spare battery charger per subsystem, which provides backup service in the event that the preferred battery charger is out of service. If the spare battery charger is substituted for one of the preferred battery chargers, then the requirements of independence and redundancy between subsystems are maintained.]

During normal operation, the [125/250] VDC load is powered from the battery chargers with the batteries floating on the system. In case of loss of normal power to the battery charger, the DC load is automatically powered from the station batteries.

The [Train A and Train B] DC electrical power subsystems provide the control power for its associated Class 1E AC power load group, [4.16] kV switchgear, and [480] V load centers. The DC electrical power subsystems also provide DC electrical power to the inverters, which in turn power the AC vital buses.

(continued)

Supplement 4

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.4.6

This SR requires that each battery charger be capable of supplying [400] amps and [125] V for ≥ [8] hours. These requirements are based on the design capacity of the chargers (Ref. 4). According to Regulatory Guide 1.32 (Ref. 10), the battery charger supply is required to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied.

Current and Voltage

Normal DC loads

The Surveillance Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these [18 month] intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

This Surveillance is required to be performed during MODES 5 and 6 since it would require the DC electrical power subsystem to be inoperable during performance of the test.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would perturb the electrical distribution system and challenge safety systems. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.4.7

A battery service test is a special test of battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements as specified in Reference 4.

The Surveillance Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 10) and Regulatory Guide 1.129 (Ref. 11), which state that the battery service test should be performed during refueling operations or at some other outage, with intervals between tests, not to exceed [18 months].

(continued)

1

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.5 DC Sources - Shutdown

BASES

BACKGROUND	A description of the DC sources is provided in the Bases for LCO 3.8.4, "DC Sources - Operating."
APPLICABLE SAFETY ANALYSES	The initial conditions of Design Basis Accident and transient analyses in the FSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume that Engineered Safety Feature systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the diesel generators, emergency auxiliaries, and control and switching during all MODES of operation. The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY. The OPERABILITY of the minimum DC electrical power sources during MODES 5 and 6 and during movement of irradiated fuel assemblies ensures that: a. The unit can be maintained in the shutdown or refueling condition for extended periods; b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and c. Adequate DC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident. The DC sources satisfy Criterion 3 of the NRC Policy Statement.
LCO	The DC electrical power subsystems, each subsystem consisting of two batteries, one battery charger one battery, and the corresponding control equipment and

(continued)

Supplement 4

①

BASES

LCO (continued)

interconnecting cabling within the train, are required to be OPERABLE to support required trains of the distribution systems required OPERABLE by LCO 3.8.10, "Distribution Systems - Shutdown." This ensures the availability of sufficient DC electrical power sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

APPLICABILITY

The DC electrical power sources required to be OPERABLE in MODES 5 and 6, and during movement of irradiated fuel assemblies, provide assurance that:

a. Required features to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core;

b. Required features needed to mitigate a fuel handling accident are available;

c. Required features necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The DC electrical power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.4.

Insert B3.8.5-1 ⑩

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, and A.2.4

If two trains are required by LCO 3.8.10, the remaining train with DC power available may be capable of supporting sufficient systems to allow continuation of CORE ALTERATIONS and fuel movement. By allowing the option to declare required features inoperable with the associated DC power source(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCO ACTIONS. In many instances, this option may involve undesired administrative efforts. Therefore, the

(continued)

Supplement 4

(1)

BASES

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, and A.2.4 (continued)

allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions). The Required Action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory, provided the required SDM is maintained.

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required DC electrical power subsystems and to continue this action until restoration is accomplished in order to provide the necessary DC electrical power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required DC electrical power subsystems should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

SURVEILLANCE REQUIREMENTS

SR 3.8.5.1

(6) (10)

SR 3.8.5.1 requires performance of all Surveillances required by SR 3.8.4.1 through SR 3.8.4.8. Therefore, see the corresponding Bases for LCO 3.8.4 for a discussion of each SR.

This SR is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DC sources from being discharged below their capability to provide the required power supply or otherwise rendered inoperable during the performance of SRs. It is the intent that these SRs must still be capable of being met, but actual performance is not required.

(continued)

Supplement 4

(1)

BASES (continued)

REFERENCES	1.	(4) FSAR, Chapter [6].
	2.	(4) FSAR, Chapter [15].

Supplement 4

BASES

ACTIONS

A.1, A.2, and A.3 (continued)

Continued operation is only permitted for 31 days before battery cell parameters must be restored to within Category A and B limits. With the consideration that, while battery capacity is degraded, sufficient capacity exists to perform the intended function and to allow time to fully restore the battery cell parameters to normal limits, this time is acceptable prior to declaring the battery inoperable.

B.1

With one or more batteries with one or more battery cell parameters outside the Category C limit for any connected cell, sufficient capacity to supply the maximum expected load requirement is not assured and the corresponding DC electrical power subsystem must be declared inoperable. Additionally, other potentially extreme conditions, such as not completing the Required Actions of Condition A within the required Completion Time or average electrolyte temperature of representative cells falling below 60°F, are also cause for immediately declaring the associated DC electrical power subsystem inoperable.

(10) 55°F for the "A" battery and 67°F for the "B" battery

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

This SR verifies that Category A battery cell parameters are consistent with IEEE-450 (Ref. 3), which recommends regular battery inspections (at least one per month) including voltage, specific gravity, and electrolyte temperature of pilot cells.

(1) (Measured to the nearest 0.01 Volts)

(1) In addition, if water is added to any pilot cell, the amount must be recorded.

SR 3.8.6.2

The quarterly inspection of specific gravity and voltage is consistent with IEEE-450 (Ref. 3). In addition, within 24 hours of a battery discharge < 110 V or a battery overcharge > 150 V, the battery must be demonstrated to meet Category B limits. Transients, ~~such as motor starting transients,~~ which may momentarily cause battery voltage to drop to ≤ 110 V, do not constitute a battery discharge

(49)

(1) Data obtained must be compared to the data from the previous SR to detect signs of abuse or deterioration.

(continued)

Supplement 4

If water is added to any battery cell, the amount must be recorded. Data obtained must be compared to the data from the previous SR to detect signs of abuse or deterioration.

(1)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.6.2 (continued)

provided the battery terminal voltage and float current return to pre-transient values. This inspection is also consistent with IEEE-450 (Ref. 3), which recommends special inspections following a severe discharge or overcharge, to ensure that no significant degradation of the battery occurs as a consequence of such discharge or overcharge.

(1) Data obtained must be compared to the data from the previous SR to detect signs of abuse or deterioration.

SR 3.8.6.3

55°F for the "A" battery + 67°F for the "B" battery (10)

This Surveillance verification that the average temperature of representative cells is ≥ 60°F is consistent with a recommendation of IEEE-450 (Ref. 3), that states that the temperature of electrolytes in representative cells should be determined on a quarterly basis.

Lower than normal temperatures act to inhibit or reduce battery capacity. This SR ensures that the operating temperatures remain within an acceptable operating range. This limit is based on manufacturer recommendations.

Table 3.8.6-1

This table delineates the limits on electrolyte level, float voltage, and specific gravity for three different categories. The meaning of each category is discussed below.

Category A defines the normal parameter limit for each designated pilot cell in each battery. The cells selected as pilot cells are those whose temperature, voltage, and electrolyte specific gravity approximate the state of charge of the entire battery.

The Category A limits specified for electrolyte level are based on manufacturer recommendations and are consistent with the guidance in IEEE-450 (Ref. 3), with the extra ¼ inch allowance above the high water level indication for operating margin to account for temperatures and charge effects. In addition to this allowance, footnote a to Table 3.8.6-1 permits the electrolyte level to be above the specified maximum level during equalizing charge, provided it is not overflowing. These limits ensure that the plates

(continued)

Supplement 4

Insert B3.8.7-2

SR 3.8.7.2

This surveillance verifies that the required circuit breakers are closed and the associated instrument buses are energized from the CVTs. Actual measurement of voltage is not required. Confirmation that the buses are energized by observing status lights, instrument displays, etc. is sufficient to confirm the instrument buses are energized. The 7 day frequency takes into account the redundant capability of the AC instrument bus sources and administrative requirements governing alignment of electrical equipment.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.8 Inverters - Shutdown

AC Instrument Bus Sources

1

10

BASES

BACKGROUND	A description of the Inverters is provided in the Bases for LCO 3.8.7, "Inverters - Operating."
APPLICABLE SAFETY ANALYSES	The initial conditions of Design Basis Accident (DBA) and transient analyses in the FSAR, Chapter [6] (Ref. 1) and Chapter [15] (Ref. 2), assume Engineered Safety Feature systems are OPERABLE. The DC to AC inverters are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to the Reactor Protective System and Engineered Safety Features Actuation System instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.
	The OPERABILITY of the inverters is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.
	The OPERABILITY of the minimum inverters to each AC vital bus during MODES 5 and 6 ensures that:
	a. The unit can be maintained in the shutdown or refueling condition for extended periods;
	b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and
	c. Adequate power is available to mitigate events postulated during shutdown, such as a fuel handling accident.
	The inverters were previously identified as part of the distribution system and, as such, satisfy Criterion 3 of the NRC Policy Statement.

Handwritten annotations: U; 10 — AC Instrument Bus Sources; 10 — AC Instrument Bus Sources; 27 — instrument; AC Instrument Bus Sources; 10 — AC Instrument Bus Sources

(continued)

Supplement 4

BASES (continued)

LCO

The inverters ensure the availability of electrical power for the instrumentation for systems required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated DBA. The battery powered inverters provide uninterruptible supply of AC electrical power to the AC vital buses even if the 4.16 kV safety buses are de-energized. OPERABILITY of the inverters requires that the AC vital bus be powered by the inverter. This ensures the availability of sufficient inverter power sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

APPLICABILITY

The inverters required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel in the core;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

Inverter requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.7.

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, and A.2.4

If two trains are required by LCO 3.8.10, "Distribution Systems - Shutdown," the remaining OPERABLE Inverters may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS, fuel movement, and operations with a potential for positive reactivity additions. By the allowance of the option to declare

(continued)

Supplement 4

BASES

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, and A.2.4 (continued)

required features inoperable with the associated ~~inverter(s)~~ inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCOs' Required Actions. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions). The Required Action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory, provided the required SDM is maintained.

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required ~~inverters~~ and to continue this action until restoration is accomplished in order to provide the necessary ~~inverter~~ power to the ~~unit~~ safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required ~~inverters~~ should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power or powered from a ~~constant voltage source transformer~~.

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and AC ~~vital~~ buses energized from the inverter. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation connected to the AC ~~vital~~ buses. The 7 day Frequency takes into account the redundant capability of the ~~inverters~~ and other indications available in the control room that alert the operator to inverter malfunctions.

(continued)

Insert B3.8.8-2

SR 3.8.8.2

This surveillance verifies that the required circuit breakers are closed and the associated instrument buses energized from the CVTs. Actual measurement of voltage is not required. Confirmation that the buses are energized by observing status lights, instrument displays, etc. is sufficient to confirm the instrument buses are energized. The 7 day frequency takes into account the redundant capability of the AC instrument bus sources and administrative requirements governing alignment of electrical equipment.

BASES (continued)

REFERENCES

1. (4) FSAR, Chapter [6]
2. (4) FSAR, Chapter [15]

Supplement 4

Insert B3.8.9-4

The trip elements of the molded case circuit breakers for the Auxiliary Feedwater (AFW) Header Discharge Valve to S/G "A", V2-16A and the Service Water System (SWS) Turbine Building Supply Valve (emergency supply), V16-16C are required to function to prevent transferring a fault from one train of the AC distribution System to the other train of the AC distribution System (Ref. 3). For this to occur, a trip element for both of the breakers associated with one valve (one connected to each train of the AC Distribution System) would have to fail.

Insert B3.8.9-5

Based on the number of safety significant electrical loads associated with each bus listed in Table B 3.8.9-1, if one or more of the buses becomes inoperable, entry into the appropriate Conditions and Required Actions of LCO 3.8.9 is required. Other buses, such as motor control centers (MCC) and distribution panels, which help comprise the AC and DC distribution systems are not listed in Table B 3.8.9-1. The loss of electrical loads associated with these buses may not result in a complete loss of a redundant safety function necessary to shut down the reactor and maintain it in a safe condition. Therefore, should one or more of these buses become inoperable due to a failure not affecting the OPERABILITY of a bus listed in Table B 3.8.9-1 (e.g., a breaker supplying a single MCC fails open), the individual loads on the bus would be considered inoperable, and the appropriate Conditions and Required Actions of the LCOs governing the individual loads would be entered. However, if one or more of these buses is inoperable due to a failure also affecting the OPERABILITY of a bus listed in Table B 3.8.9-1 (e.g., loss of a 480 V emergency bus, which results in de-energization of all buses powered from the 480 V emergency bus), then although the individual loads are still considered inoperable, the Conditions and Required Actions of the LCO for the individual loads are not required to be entered, since LCO 3.0.6 allows this exception (i.e., the loads are inoperable due to the inoperability of a support system governed by a Technical Specification; the 480 V emergency bus).

The trip elements of the two molded case circuit breakers for both the Auxiliary Feedwater (AFW) Header Discharge Valve to S/G "A", V2-16A and the Service Water System (SWS) Turbine Building Supply Valve (emergency supply), V16-16C are required to be OPERABLE to provide isolation between the separate AC distribution subsystems.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1 Instrument (27)

This Surveillance verifies that the [required] AC, DC, and AC [vital] bus electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence of the electrical divisions is maintained, and the appropriate voltage is available to each required bus. ~~The verification of proper voltage availability on the buses ensures that the required voltage is readily available for motive as well as control functions for critical system loads connected to these buses.~~ (10) (27) The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC [vital] instrument bus electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.

Insert B.3.8.9-7 (41)

REFERENCES

1. (U) [F]SAR, Chapter [6].
2. (U) [F]SAR, Chapter [15].
(3) (4) Regulatory Guide 1.93, December 1974.

3. SER for HBRSEP Unit No. 2 Amendment 123 dated Sept. 5, 1989

(10) This SR is modified by a Note which states that voltage measurement is not required for the AC Instrument buses supplied from constant voltage transformers (CVTs). For these buses confirmation the buses are energized by observing status lights, instrument displays, etc. is sufficient to confirm the buses are energized.

Supplement 4

Insert B3.8.9-7

SR 3.8.9.2 and SR 3.8.9.3

These surveillances verify the two breakers associated with each ABT will trip on overcurrent as required to prevent a fault from affecting both trains of the AC distribution system. The 18 month Frequency of the Surveillance is based on engineering judgement, taking into consideration the unit conditions desirable for performing the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore the Frequency was concluded to be acceptable from a reliability standpoint.

Insert B3.8.9-8

TYPE	VOLTAGE	TRAIN A*	TRAIN B*
AC buses	4160 V 480 V	4.16 kV Bus 2 480 V Bus E1	4.16 kV Bus 3 480 V Bus E2
DC buses	125 V	MCC A Distribution Panel A	MCC B Distribution Panel B
AC instrument buses (IB)	120V	IB 1 IB 2 IB 6 IB 7 (A & B)	IB 3 IB 4 IB 8 IB 9 (A & B)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.10 Distribution Systems – Shutdown

BASES

BACKGROUND

A description of the AC, DC, and AC vital bus electrical power distribution systems is provided in the Bases for LCO 3.8.9, "Distribution Systems – Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident and transient analyses in the FSAR, Chapter [6] (Ref. 1) and Chapter [15] (Ref. 2), assume Engineered Safety Feature (ESF) systems are OPERABLE. The AC, DC, and AC vital bus electrical power distribution systems are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the AC, DC, and AC vital bus electrical power distribution system is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum AC, DC, and AC [redacted] bus electrical power distribution subsystems during MODES 5 and 6, and during movement of irradiated fuel assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

The AC and DC electrical power distribution systems satisfy Criterion 3 of the NRC Policy Statement.

(continued)

Supplement 4

BASES (continued)

LCO

Various combinations of subsystems, equipment, and components are required OPERABLE by other LCOs, depending on the specific plant condition. Implicit in those requirements is the required OPERABILITY of necessary support required features. This LCO explicitly requires energization of the portions of the electrical distribution system necessary to support OPERABILITY of required systems, equipment, and components – all specifically addressed in each LCO and implicitly required via the definition of OPERABILITY.

Maintaining these portions of the distribution system energized ensures the availability of sufficient power to operate the unit in a safe manner to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

APPLICABILITY

The AC and DC electrical power distribution subsystems required to be OPERABLE in MODES 5 and 6, and during movement of irradiated fuel assemblies, provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel in the core;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition and refueling condition.

27 instrument

The AC, DC, and AC vital bus electrical power distribution subsystems requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.9.

10

Insert B 3.8.10-1

BASES (continued)

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, A.2.4, and A.2.5

Although redundant required features may require redundant trains of electrical power distribution subsystems to be OPERABLE, one OPERABLE distribution subsystem train may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and fuel movement. By allowing the option to declare required features associated with an inoperable distribution subsystem inoperable, appropriate restrictions are implemented in accordance with the affected distribution subsystem LCO's Required Actions. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions).

Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC and DC electrical power distribution subsystems and to continue this action until restoration is accomplished in order to provide the necessary power to the unit safety systems.

Notwithstanding performance of the above conservative Required Actions, a required residual heat removal (RHR) subsystem may be inoperable. In this case, Required Actions A.2.1 through A.2.4 do not adequately address the concerns relating to coolant circulation and heat removal. Pursuant to LCO 3.0.6, the RHR ACTIONS would not be entered. Therefore, Required Action A.2.5 is provided to direct declaring RHR inoperable, which results in taking the appropriate RHR actions.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required distribution subsystems should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power.

(continued)

Supplement 4

(1) (27)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1

This Surveillance verifies that the AC, DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems are functioning properly, with all the buses energized. ~~The verification of proper voltage availability on the buses ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses.~~ (10) The 7 day Frequency takes into account the capability of the electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.

This SR is modified by a Note which states that voltage measurement is not required for the AC Instrument buses supplied from constant voltage transformers (CVTs). For these buses confirmation that the buses are energized by observing status lights, instrument displays, etc. is sufficient to confirm the buses are energized. (10)

REFERENCES

1. (U)FSAR, Chapter ~~6~~
2. (U)FSAR, Chapter ~~15~~

Supplement 4

1 In the conversion of the HBRSEP current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes which involve the insertion of plant specific terms or parameters are used to preserve consistency with the CTS and licensing basis.

2 The HBRSEP design preceded the finalization of contemporary electrical design standards. Consequentially the term Class 1E is not applied to HBRSEP.

3 The HBRSEP design provides one circuit normally available between the offsite transmission network and the onsite AC Electrical Power Distribution System.

4 HBRSEP was designed and licensed to the proposed Appendix A to 10 CFR 50, which was published in the Federal Register on July 11, 1967 (FR 32FR10213). Appendix A to 10 CFR 50 effective in 1971 and subsequently amended, is somewhat different from the proposed 1967 criteria. UFSAR section 3.1 includes an evaluation of HBRSEP with respect to the proposed 1967 criteria. The ISTS statement concerning the GDC criteria is modified in the ITS to reference the current licensing basis description in the UFSAR.

5 The HBRSEP design is not the same as the ISTS reference plant. A summary description of the plant offsite circuits and normal plant alignment is substituted.

6 The HBRSEP design provides 480 V Diesel Generators (DG) and 480 V ESF Emergency Buses.

7 HBRSEP is not committed to RG 1.9.

8 The HBRSEP design does not include protection from loss of onsite power and an additional single failure.

9 The example listed is not applicable to the HBRSEP design. The HBRSEP DG is inoperable while operating in parallel test mode.

10 The Bases are modified to be consistent with the scope and content of the associated specification.

11 HBRSEP is not committed to RG 1.93.

12 HBRSEP is not committed to ANSI C84.1.

13 The bases for SR 3.8.1.4 is modified to reflect the HBRSEP plant design. The HBRSEP design provides DG fuel oil day tanks which begin to refill

when the tank is 1/2 full. This corresponds to approximately 137.5 gallons. The specified 140 gallons is sufficient for 35 minutes of DG operation at full load with a 10% margin.

14 HBRSEP is not committed to RG 1.108.

15 The HBRSEP design provides a manual bypass of the DG protective trips. The bypass of the protective trips is the normal condition.

16 Consistent with the current licensing basis (CLB) diesel fuel oil for both DGs is stored in a combination of the Unit 2 DG fuel oil storage tank and the Unit 1 IC fuel oil storage tanks.

17 Consistent with the CLB, the required DG fuel oil quantity is sufficient for operation of one DG at full load for seven days.

18 The HBRSEP design is not the same as the ISTS reference plant. A summary description of the plant DG Fuel Oil System is substituted.

19 HBRSEP commitments to RG 1.137 recommendations are limited as discussed in the current licensing basis. The DG Fuel Oil Testing Program includes applicable requirements. Upon implementation of ITS, surveillance requirements for fuel oil will be applied to fuel oil stored in Unit 1 storage tanks as well as the Unit 2 DG fuel oil storage tank.

20 The DG air start subsystem can provide eight starts without being refilled.

21 Consistent with the CLB sampling is not performed in accordance with ASTM standards. Refer to CP&L letter to NRC dated May 15, 1992.

22 ISTS bases discussion for SR 3.8.3.3 is not applicable based on the CLB. The CLB for HBRSEP does not include sampling to any specific standard and requires fuel oil to meet diesel generator manuafacturer's requirements. Amendment No. 174 involving DG requirements was recently approved (9/11/96) without imposing any fuel oil sampling standards. Operating experience coupled with CLB demonstrate the adequacy of current practice to maintain fuel oil quality.

23 Not Used.

24 Flash point is not a characteristic included in the DG Fuel Oil Testing Program.

25 Details of the offsite circuit as well as an additional description provided for completeness are relocated from the CTS.

26 The HBRSEP design provides a manual, not automatic, bypass of the noncritical DG trip functions.

27 The term instrument bus is used in lieu of vital bus.

28 The HBRSEP design provides for protection from a single active failure.

29 HBRSEP is not committed to RG 1.6 nor IEEE-308.

30 The HBRSEP design provides for separate but not totally independent AC and DC systems.

31 The HBRSEP design provides power for four of the eight instrument buses from the DC supplied inverters. The remaining four instrument buses are powered from constant voltage transformers (CVT).

32 The HBRSEP battery design is adequate to carry the required load continuously for one hour. Intermittent loading is not within the CLB.

33 Consistent with the CLB a battery charger is capable of recharging a partially discharged battery within 24 hours while carrying its normal load.

34 Not used.

35 The HBRSEP design provides one 125 Vdc battery for each subsystem.

36 The design capability of the charger does not limit the test duration.

37 HBRSEP is not committed to RG 1.32 or RG 1.129.

38 The HBRSEP does not specify the desing load profile for the batteries. |

39 The 18 month surveillance interval is not specifically addressed in the 1980 revision of IEEE-450.

40 The HBRSEP design utilizes inverters to provide AC power for four of the eight 120 V instrument buses. The remaining four 120 V instrument buses are supplied from constant voltage transformers (CVT). Appropriate discussion is provided in the Bases to address the modifications to the ISTS developed to incorporate the CVTs into the ISTS Inverters specification. Appropriate discussion is provided in the Bases to the ISTS specification for Distribution Systems to properly describe the HBRSEP design.

41 The HBRSEP design includes specified components which are powered from both AC power trains by utilization of an Automatic Bus Transfer (ABT) scheme. An appropriate bases discussion is included to describe plant

features involving the Automatic Bus Transfer function for specified plant equipment.

42 Modified to include plant specific information.

43 The HBRSEP design does not provide an AC backup source within the inverters.

44 HBRSEP is not committed to IEEE-485.

45 Appropriate discussion is provided in the bases to the ISTS specification to describe the battery "B" acceptance criterion.

46 Not used.

47 The testing specified by ITS SR 3.8.1.3 specifies the DGs be operated at or near but no greater than the DGs continuous rating. The maximum expected DG loading for a DBA is slightly greater than the continuous rating of the DGs.

48 The HBRSEP design provides two battery chargers for each battery. Consequently, ITS 3.8.4.4 can be performed on one charger while the other charger remains connected to the battery.

49 The HBRSEP design does not utilize the batteries to power motor loads.

50 The "B" battery is sized based on a different criteria than the "A" battery. Specific information regarding the basis for the sizing of the "B" battery is provided.

51 The HBRSEP 480 V subsystem design provides motors rated (nominally) at 440 V and 460 V. The bases section is revised to reflect this plant specific information.

52 The STS states that the accident analysis assumes loss of either offsite or onsite AC power combined with a worst case single failure. This condition is not an analyzed event for HBRSEP. Loss of onsite power with an additional single failure results in a unit blackout, which is not an analyzed event considered in the design bases of the plant. The change is necessary to ensure the accuracy of the Bases statement relative to the HBRSEP design.

The addition of the term "active" to the STS wording of single failure is necessary to reflect the current licensing basis for HBRSEP, Unit No. 2. The HBRSEP, Unit No. 2 design is based on consideration of "single active failures." Although consideration of passive failures were considered on a few systems (i.e., Service Water System), consideration of passive failures was not extended to the electrical

systems. Therefore to ensure accuracy as well as consistency with other ITS sections, the term "single active failure" is used.

53 Provided clarification that in MODES 5 and 6 the unit auxiliary transformer backfed through the unit main transformer can be used as part of the qualified offsite circuit. This is CLB for HBRSEP Unit No. 2. The use of back charged unit auxiliary transformer when unit is shutdown is described in UFSAR Sections 8.2 and 8.3. This capability was reviewed and approved by NRC by issuance of Amendment No. 88 dated 1/2/85.

54 The references are modified based upon either plant specific utilization in the associated Bases or specific applicability to the facility.

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources – Operating

LCO 3.8.1 The following AC electrical sources shall be OPERABLE:

a. The qualified circuit between the offsite transmission network and the onsite emergency AC Electrical Power Distribution System; and

b. Two diesel generators (DGs) capable of supplying the onsite emergency power distribution subsystem(s)

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The qualified offsite circuit inoperable.	A.1 Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable.	12 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s).
	<u>AND</u>	
	A.2 Restore offsite circuit to OPERABLE status.	24 hours <u>AND</u> 8 days from discovery of failure to meet LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. One DG inoperable.	B.1	Perform SR 3.8.1.1 for the offsite circuit.	1 hour AND Once per 12 hours thereafter
	AND		
	B.2	Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)
	AND		
	B.3.1	Perform SR 3.8.1.2 for OPERABLE DG	24 hours
	OR		
	B.3.2.1	Determine OPERABLE DG is not inoperable due to common cause failure.	24 hours
		AND	
	B.3.2.2	Perform SR 3.8.1.2 for OPERABLE DG.	96 hours
	AND		
			(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.4 Restore DG to OPERABLE status.	7 days <u>AND</u> 8 days from discovery of failure to meet LCO
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 5.	6 hours 36 hours
D. Two or more AC sources inoperable.	-----------NOTE----------- Entry into this Required Action may be delayed for no greater than 2 hours during performance of Required Action B.3.1 and Required Action B.3.2.2. ---------------------------- D.1 Enter LCO 3.0.3.	 Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for the offsite circuit.	7 days
SR 3.8.1.2	------------------NOTES------------------ 1. Performance of SR 3.8.1.7 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met. --- Verify each DG starts from standby conditions and achieves steady state voltage ≥ 467 V and ≤ 493 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.3	-------------------NOTES------------------ 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 4. This SR shall be preceded by and immediately follow without shutdown a successful performance of SR 3.8.1.2 or SR 3.8.1.7. 5. During periods when a diesel generator is being operated for testing purposes, its protective trips need not be bypassed after the diesel generator has properly assumed the load on its bus. -- Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 2350 kW and ≤ 2500 kW.	31 days
SR 3.8.1.4	Verify each day tank contains ≥ 140 gallons of fuel oil.	31 days
SR 3.8.1.5	Check for and remove accumulated water from each day tank.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.6	Verify the fuel oil transfer system operates to automatically transfer fuel oil from storage tank to the day tank.	31 days
SR 3.8.1.7	-----NOTES----- All DG starts may be preceded by an engine prelube period. -----	
	Verify each DG starts from standby condition and achieves in ≤ 10 seconds, voltage ≥ 467 V and frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains voltage ≥ 467 V and ≤ 493 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	184 days
SR 3.8.1.8	-----NOTES----- 1. This Surveillance shall not be performed in MODE 1 or 2. 2. If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9. -----	
	[Verify each DG rejects a load geater than or equal to its associated single largest post-accident load, and: a. Following load rejection, the frequency is ≤ 68.7 Hz; b. Within 3 seconds following load rejection, the voltage is ≥ 467 V and ≤ 493 V; and c. Within 3 seconds following load rejection, the frequency is ≥ 58.8 Hz and ≤ 61.2 Hz.]	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	-----NOTES----- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. 3. During periods when a diesel generator is being operated for testing purposes, its protective trips need not be bypassed after the diesel generator has properly assumed the load on its bus. ---------- Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected shutdown loads through automatic load sequencer, 3. maintains steady state voltage ≥ 467 V and ≤ 493 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.10	-----------------NOTES----------------- 1. All DG starts may be preceded by prelube period. 2. This Surveillance shall not be performed in MODE 1 or 2. 3. During periods when a diesel generator is being operated for testing purposes, its protective trips need not be bypassed after the diesel generator has properly assumed the load on its bus. ---------------------------------------	
	Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each DG auto-starts from standby condition and: a. In ≤ 10 seconds after auto-start achieves voltage ≥ 467 V, and after steady state conditions are reached, maintains voltage ≥ 467 V and ≤ 493 V; b. In ≤ 10 seconds after auto-start achieves frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains frequency ≥ 58.8 Hz and ≤ 61.2 Hz; c. Operates for ≥ 5 minutes; d. Permanently connected loads remain energized from the offsite power system; and e. Emergency loads are energized through the automatic load sequencer from the offsite power system.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	Verify each DG's automatic trips are bypassed except engine overspeed.	18 months
SR 3.8.1.12	-----NOTES----- 1. Momentary transients outside the load and power factor ranges do not invalidate this test. 2. This Surveillance shall not be performed in MODE 1 or 2. 3. During periods when a diesel generator is being operated for testing purposes, its protective trips need not be bypassed after the diesel generator has properly assumed the load on its bus. ---------- Verify each DG operating at a power factor ≤ 0.9 operates for ≥ 24 hours: a. For ≥ 1.75 hours loaded ≥ 2650 kW and ≤ 2750 kW; and b. For the remaining hours of the test loaded ≥ 2400 kW and ≤ 2500 kW.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.13	------------------NOTES------------------ 1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 2400 kW and ≤ 2500 kW. Momentary transients outside of load range do not invalidate this test. 2. All DG starts may be preceded by an engine prelube period. -- Verify each DG starts and achieves, in ≤ 10 seconds, voltage ≥ 467 V, and frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains voltage ≥ 467 V and ≤ 493 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	18 months
SR 3.8.1.14	------------------NOTE------------------ This Surveillance shall not be performed in MODE 1, 2, 3, or 4. -- Verify interval between each sequenced load block is within ± 0.4 seconds of design interval for each emergency load sequencer.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.15	------------------NOTES------------------ 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. 3. During periods when a diesel generator is being operated for testing purposes, its protective trips need not be bypassed after the diesel generator has properly assumed the load on its bus. ---	
	Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through load sequencer, 3. achieves steady state voltage ≥ 467 V and ≤ 493 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and	18 months
		(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.15	(continued) 5. supplies permanently connected and auto connected emergency loads for ≥ 5 minutes.	
SR 3.8.1.16	------------------NOTE------------------ 1. This Surveillance shall not be perfomed in MODE 1 or 2. 2. SR 3.8.1.16 is not required to be met if 4.160 kV bus 2 and 480 V Emergency Bus 1 power supply is from the start up transformer. -- Verify automatic transfer capability of the 4.160 kV bus 2 and the 480 V Emergency bus 1 loads from the Unit auxiliary transformer to the start up transformer.	18 months
SR 3.8.1.17	------------------NOTE------------------ All DG starts may be preceded by an engine prelube period. -- Verify when started simultaneously from standby condition, each DG achieves, in ≤ 10 seconds, voltage ≥ 467 V and frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains voltage ≥ 467 V and ≤ 493 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	10 years

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources – Shutdown

LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:

a. One qualified circuit between the offsite transmission network and the onsite AC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems – Shutdown"; and

b. One diesel generator (DG) capable of supplying one train of the onsite AC electrical power distribution subsystem(s) required by LCO 3.8.10.

APPLICABILITY: MODES 5 and 6 and
During movement of irradiated fuel assemblies.

ACTIONS

------------------------------------NOTE------------------------------------

LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The required offsite circuit inoperable.	------------NOTE------------ Enter applicable Conditions and Required Actions of LCO 3.8.10, with one required train de-energized as a result of Condition A. -----------------------------	
	A.1 Declare affected required feature(s) with no offsite power available inoperable.	Immediately
	OR	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	AND	
	A.2.3 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	AND	
	A.2.4 Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately
B. The required DG inoperable.	B.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	B.2 Suspend movement of irradiated fuel assemblies.	Immediately
	AND	(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.3 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u>	
	B.4 Initiate action to restore required DG to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.2.1	------------------NOTE------------------ The following SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.8, SR 3.8.1.9, SR 3.8.1.11 through SR 3.8.1.15. ---	
	For AC sources required to be OPERABLE, the SRs of Specification 3.8.1, "AC Sources – Operating," except SR 3.8.1.16, and SR 3.8.1.17, are applicable.	In accordance with applicable SRs

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One or more DGs with new fuel oil properties not within limits.	C.1	Restore stored fuel oil properties to within limits.	30 days
D. One or more DGs with starting air receiver pressure < 210 psig and ≥ 100 psig.	D.1	Restore starting air receiver pressure to ≥ 210 psig.	48 hours
E. Required Action and associated Completion Time not met. OR Common stored DGs diesel fuel oil or starting air subsystem for each DG not within limits for reasons other than Condition A, B, C, or D.	E.1	Declare associated DG(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify ≥ 19,000 gallons of diesel fuel oil available to the DGs from the Unit 2 DG fuel oil storage tank AND ≥ 34,000 gallons available to the DGs from the combination of the Unit 1 IC turbine fuel oil storage tanks and the Unit 2 DG fuel oil storage tank.	7 days
SR 3.8.3.2	Verify fuel oil properties of stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.8.3.3	Verify each DG air start receiver pressure is ≥ 210 psig.	31 days
SR 3.8.3.4	Check for and remove accumulated water from each fuel oil storage tank.	31 days

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.4.2	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	18 months
SR 3.8.4.3	Remove visible terminal corrosion, verify battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.	18 months
SR 3.8.4.4	Verify each battery charger supplies ≥ 300 amps at ≥ 125 V for ≥ 4 hours.	18 months
SR 3.8.4.5	------------------NOTES------------------ 1. The performance discharge test in SR 3.8.4.6 may be performed in lieu of the service test in SR 3.8.4.5 once per 75 months. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. -- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	18 months

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources – Shutdown

LCO 3.8.5 DC electrical power subsystem shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems – Shutdown."

APPLICABILITY: MODES 5 and 6, and
During movement of irradiated fuel assemblies.

ACTIONS

------------------------------------NOTE------------------------------------
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required DC electrical power subsystems inoperable.	A.1.1 Declare affected required feature(s) inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	<u>AND</u>	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 Initiate action to restore required DC electrical power subsystems to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.5.1	------------------NOTE------------------ The following SRs are not required to be performed: SR 3.8.4.4, SR 3.8.4.5, and SR 3.8.4.6. --- For DC sources required to be OPERABLE, the following SRs are applicable: SR 3.8.4.1 SR 3.8.4.3 SR 3.8.4.5 SR 3.8.4.2 SR 3.8.4.4 SR 3.8.4.6	In accordance with applicable SRs

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct inverter voltage, frequency, and alignment to required AC instrument buses.	7 days
SR 3.8.7.2	Verify voltage availability and correct CVT alignment to required AC instrument buses.	7 days

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 AC Instrument Bus Sources – Shutdown

LCO 3.8.8 AC instrument bus source shall be OPERABLE to support the onsite AC instrument bus electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems – Shutdown."

APPLICABILITY: MODES 5 and 6, and
During movement of irradiated fuel assemblies.

ACTIONS

-----------------------------------NOTE-----------------------------------
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more AC instrument bus sources inoperable.	A.1 Declare affected required feature(s) inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.3 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	AND	
	A.2.4 Initiate action to restore AC instrument bus sources to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct inverter voltage, frequency, and alignments to required AC instrument buses.	7 days
SR 3.8.8.2	Verify voltage availability and correct CVT alignments to required AC instrument buses.	7 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
G. Two trains with inoperable distribution subsystems that result in a loss of safety function.	G.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.9.1	------------------NOTE------------------ Actual voltage measurement is not required for the AC vital buses supplied from the constant voltage transformers. -- Verify correct breaker alignments and voltage to AC, DC, and AC instrument bus electrical power distribution subsystems.	7 days
SR 3.8.9.2	Verify capability of the two molded case circuit breakers for AFW Header Discharge Valve to S/G "A", V2-16A to trip on overcurrent.	18 months
SR 3.8.9.3	Verify capability of the two molded case circuit breakers for Service Water System Turbine Building Supply Valve (emergency supply), V6-16C to trip on overcurrent.	18 months

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems – Shutdown

LCO 3.8.10 The necessary portion of AC, DC, and AC instrument bus electrical power distribution subsystems shall be OPERABLE to support equipment required to be OPERABLE.

APPLICABILITY: MODES 5 and 6, and
During movement of irradiated fuel assemblies.

ACTIONS

------------------------------------NOTE------------------------------------
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC, DC, or AC instrument bus electrical power distribution subsystems inoperable.	A.1 Declare associated supported required feature(s) inoperable.	Immediately
	OR	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	AND	
	A.2.3 Initiate action to suspend operations involving positive reactivity additions.	Immediately
	AND	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 Initiate actions to restore required AC, DC, and AC instrument bus electrical power distribution subsystems to OPERABLE status.	Immediately
	<u>AND</u>	
	A.2.5 Declare associated required residual heat removal subsystem(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.10.1	------------------NOTE------------------ Actual voltage measurement is not required for the AC vital buses supplied from constant voltage transformers. --- Verify correct breaker alignments and voltage to required AC, DC, and AC instrument bus electrical power distribution subsystems.	7 days

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.1 AC Sources – Operating

BASES

BACKGROUND

The unit AC Electrical Power Distribution System AC sources consist of the offsite power source (preferred power source), and the onsite standby power sources (Train A and Train B diesel generators (DGs)). As required by HBRSEP design criteria (Ref. 1), the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems.

The onsite emergency AC Distribution System is divided into redundant load groups (trains) so that the loss of any one group does not prevent the minimum safety functions from being performed. Each train has connections to the preferred offsite power source and a single DG.

Offsite power is supplied to the unit switchyard(s) from the transmission network by multiple transmission lines. The 480 V ESF bus E2 is normally powered from the 115 kV switchyard through the startup transformer, 4.160 kV bus 3 and station service transformer 2G. The 480 V ESF bus E2 is normally powered from the 115 kV switchyard through the startup transformer, 4.160 kV bus 3 and station service transformer 2G. The 480 V ESF bus E1 is normally powered from the turbine generator through the unit auxiliary transformer, 4.160 kV buses 1 and 2 and station service transformer 2F. A main generator lockout causes 4.160 kV buses 1 and 2 to be automatically transferred to the startup transformer which results in 480 V ESF bus E1 being supplied from the startup transformer.

Should a failure of the startup transformer occur, a spare startup transformer located onsite can be jumpered into service. During the time that the startup transformer is out of service, the unit auxiliary transformer is capable of supplying power to the onsite distribution system while powered from the turbine generator or by back-feeding the main transformer from the 230 kV switchyard. The unit auxiliary transformer powered from the turbine generator is not a qualified offsite circuit. Prior to back-feeding the main transformer from the 230 kV switchyard, the generator must be disconnected from the main transformer by removing

(continued)

BASES

BACKGROUND (continued)

the connecting straps. The main transformer backfeeding will only be done during cold shutdown unless nuclear safety considerations require it to be done during hot shutdown (in accordance with applicable Required Actions) when no other offsite power sources are available. A detailed description of the offsite power network and the circuits to the ESF buses is found in the UFSAR, Chapter 8 (Ref. 2).

An offsite circuit consists of all breakers, transformers, switches, interrupting devices, cabling, and controls required to transmit power from the offsite transmission network to the onsite ESF buses. In MODES 1, 2, 3, and 4, the offsite circuit is through the startup transformer.

Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the transformer supplying offsite power to the onsite Distribution System. Within 1 minute after the initiating signal is received, all automatic and permanently connected loads needed to recover the unit or maintain it in a safe condition are returned to service via the load sequencer.

The onsite standby power source for each 480 V ESF bus is a dedicated emergency DG. DGs A and B are dedicated to ESF buses E1 and E2, respectively. A DG starts automatically on a safety injection (SI) signal (e.g., low pressurizer pressure or high containment pressure signals) or on an ESF bus degraded voltage or undervoltage signal (refer to LCO 3.3.5, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation"). After the DG has started, it will automatically tie to its respective bus after offsite power is tripped as a consequence of ESF bus undervoltage or degraded voltage, independent of or coincident with an SI signal. The DGs will also start and operate in the standby mode without tying to the ESF bus on an SI signal alone. Following the trip of offsite power, an undervoltage signal strips nonpermanent loads from the ESF bus. When the DG is tied to the ESF bus, loads are then sequentially connected to its respective ESF bus by the automatic load sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading the DG by automatic load application.

In the event of the loss of preferred power, the ESF electrical loads are automatically connected to the DGs in sufficient time to provide for safe reactor shutdown and to

(continued)

BASES

BACKGROUND (continued)

mitigate the consequences of a Design Basis Accident (DBA) such as a loss of coolant accident (LOCA).

Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the DG in the process. Within 1 minute after the initiating signal is received, all loads needed to recover the unit or maintain it in a safe condition are returned to service.

The continuous service rating of each DG is 2500 kW with 10% overload permissible for up to 2 hours in any 24 hour period. Operation above the continuous service rating for longer than that time period is not allowed. Additionally, operation above the short-term overload limit (i.e., 2750KW) is not allowed. The ESF loads that are powered from the 480 V ESF buses are listed in Reference 2.

APPLICABLE SAFETY ANALYSES

The initial conditions of DBA and transient analyses in the UFSAR, Chapter 6 (Ref. 4) and Chapter 15 (Ref. 5), assume ESF systems are OPERABLE. The AC electrical power sources are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System (RCS), and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

The OPERABILITY of the AC electrical power sources is consistent with the initial assumptions of the Accident analyses and is based upon meeting the design basis of the unit. This results in maintaining at least one train of the onsite or offsite AC sources OPERABLE during Accident conditions in the event of:

a. An assumed loss of all offsite power or all onsite AC power; or

b. An assumed loss of offsite AC power and a worst case single active failure.

The AC sources satisfy Criterion 3 of NRC Policy Statement.

(continued)

BASES (continued)

LCO

The qualified circuit between the offsite transmission network and the onsite Electrical Power System and separate and independent DGs for each train ensure availability of the required power to shut down the reactor and maintain it in a safe shutdown condition after an anticipated operational occurrence (AOO) or a postulated DBA. The qualified offsite circuit is described in the UFSAR and is part of the licensing basis for the unit.

The 110 kV to 4160 V startup transformer must be in service and the 4160 V buses 2 and 3 as well as the remainder of the offsite circuit from the 4160 V buses 2 and 3 to the 480 V buses E1 and E2 must be energized.

The offsite circuit is capable of maintaining rated frequency and voltage within acceptable limits, and accepting required loads during an accident, while connected to the ESF buses.

Each emergency DG must be capable of starting, accelerating to rated speed and voltage (within the tolerances specified in the associated surveillances), and connecting to its respective ESF bus on detection of bus undervoltage. This will be accomplished within 10 seconds. Each DG must also be capable of accepting required loads within the assumed loading sequence intervals, and continue to operate until offsite power can be restored to the ESF buses. These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot and DG in standby with the engine at ambient conditions. Additional DG capabilities must be demonstrated to meet required Surveillance. Additionally, for a DG to be considered OPERABLE, the following protective trips must be bypassed to prevent a governor shutdown:

a. Low lube oil pressure

b. Low coolant pressure

c. High coolant temperature

d. High crankcase pressure

e. Start failure - governor shutdown

(continued)

BASES

LCO (continued)

Proper sequencing of loads, including tripping of nonessential loads, is a required function for DG OPERABILITY.

The AC sources in one train are separate and independent (to the extent possible) of the AC sources in the other train. For the DGs, separation and independence are complete.

APPLICABILITY

The AC sources are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

b. Adequate core cooling is provided and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

The AC power requirements for MODES 5 and 6 are covered in LCO 3.8.2, "AC Sources – Shutdown and During Movement of Irradiated Fuel Assemblies."

ACTIONS

A.1

Required Action A.1, which only applies if the train cannot be powered from an offsite source, is intended to provide assurance that an event coincident with a single failure of the associated DG will not result in a complete loss of safety function of critical redundant required features. These features are powered from the redundant AC electrical power train. This includes motor driven auxiliary feedwater pumps. Single train systems, such as turbine driven auxiliary feedwater pumps, may not be included.

The Completion Time for inoperability of the offsite source is 12 hours. The rationale for the 12 hours is that Regulatory Guide 1.93 (Ref. 10) allows a Completion Time of 24 hours for two required offsite circuits inoperable when two offsite sources are incorporated into the design, based

(continued)

BASES

ACTIONS

A.1 (continued)

upon the assumption that two complete safety trains are OPERABLE. When no offsite sources are OPERABLE, this assumption is not the case, and a shorter Completion Time of 12 hours is appropriate.

Operation may continue in Condition A for a period that should not exceed 24 hours. With the offsite circuit inoperable, the reliability of the AC system is degraded, with attendant potential for a challenge to the unit safety systems. In this Condition, however, the remaining OPERABLE DGs are adequate to supply electrical power to the onsite Distribution System.

The 24 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

The second Completion Time for Required Action A.1 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition A is entered while, for instance, a DG is inoperable and that DG is subsequently returned OPERABLE, the LCO may already have been not met for up to 7 days. This could lead to a total of 8 days, since initial failure to meet the LCO, to restore the offsite circuit. At this time, a DG could again become inoperable, the circuit restored OPERABLE, and an additional 7 days (for a total of 15 days) allowed prior to complete restoration of the LCO. The 8 day Completion Time provides a limit on the time allowed in a specified condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 24 hours and 8 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

The Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This will result in establishing the "time zero" at the time that the LCO was initially not met, instead of at the time Condition A was entered.

(continued)

BASES

ACTIONS (continued)

B.1

To ensure a highly reliable power source remains with an inoperable DG, it is necessary to verify the availability of the offsite circuit on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action being not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon offsite circuit inoperability, additional Conditions and Required Actions must then be entered.

B.2

Required Action B.2 is intended to provide assurance that a loss of offsite power, during the period that a DG is inoperable, does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps. Single train systems, such as turbine driven auxiliary feedwater pumps, are not included. Redundant required feature failures consist of inoperable features associated with a train, redundant to the train that has an inoperable DG.

The Completion Time for Required Action B.2 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. An inoperable DG exists; and

b. A required redundant feature on the other train (Train A or Train B) is inoperable.

If at any time during the existence of this Condition (one DG inoperable) a required feature subsequently becomes inoperable, this Completion Time would begin to be tracked.

Discovering one required DG inoperable coincident with one or more inoperable required support or supported features,

(continued)

BASES

ACTIONS

B.2 (continued)

or both, that are associated with the OPERABLE DG, results in starting the Completion Time for the Required Action. Four hours from the discovery of these events existing concurrently is Acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

In this Condition, the remaining OPERABLE DG and offsite circuit is adequate to supply electrical power to the onsite Distribution System. Thus, on a component basis, single failure protection for the required feature's function may have been lost; however, function has not been lost. The 4 hour Completion Time takes into account the OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 4 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

B.3.1, B.3.2.1, and B.3.2.2

Required Action B.3.1 requires performing SR 3.8.1.2 for the OPERABLE DG within 24 hours. This action is required to confirm the remaining DG remains OPERABLE.

Required Action B.3.2.1 provides an allowance to avoid unnecessary testing of the OPERABLE DG. If it can be determined that the cause of the inoperable DG does not exist on the OPERABLE DG, SR 3.8.1.2 does not have to be performed within 24 hours. If the cause of inoperability exists on the other DG, the other DG would be declared inoperable upon discovery and Condition D of LCO 3.8.1 would be entered. Once the failure is repaired, the common cause failure no longer exists, and Required Action B.3.1 is satisfied. If the cause of the initial inoperable DG cannot be confirmed not to exist on the remaining DG(s), performance of SR 3.8.1.2 suffices to provide assurance of continued OPERABILITY of that DG.

If it is verified within 24 hours that the OPERABLE DG is not inoperable due to common cause failure, SR 3.8.1.2 need not be performed within 24 hours. However, it is still necessary to verify the OPERABILIlY of the OPERABLE DG

(continued)

BASES

ACTIONS

B.3.1, B.3.2.1, and B.3.2.2 (continued)

within 96 hours. Testing the OPERABLE DG more than once during the 7 day Completion Time is not required.

In the event the inoperable DG is restored to OPERABLE status prior to completing either B.3.1 or B.3.2, the plant corrective action program will continue to evaluate the common cause possibility. This continued evaluation, however, is no longer under the 24 hour constraint imposed while in Condition B.

According to Generic Letter 84-15 (Ref. 6), 24 hours is reasonable to confirm that the OPERABLE DG(s) is not affected by the same problem as the inoperable DG.

B.4

Operation may continue in Condition B for a period that should not exceed 7 days.

In Condition B, the remaining OPERABLE DG and offsite circuit are adequate to supply electrical power to the onsite Distribution System. The 7 day Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

The second Completion Time for Required Action B.4 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an offsite circuit is inoperable and that circuit is subsequently restored OPERABLE, the LCO may already have been not met for up to 24 hours. This could lead to a total of 8 days, since initial failure to meet the LCO, to restore the DG. At this time, an offsite circuit could again become inoperable, the DG restored OPERABLE, and an additional 24 hours (for a total of 9 days) allowed prior to complete restoration of the LCO. The 8 day Completion Time provides a limit on time allowed in a specified condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND"

(continued)

BASES

ACTIONS

B.4 (continued)

connector between the 7 day and 8 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

As in Required Action B.2, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed time "clock." This will result in establishing the "time zero" at the time that the LCO was initially not met, instead of at the time Condition B was entered.

C.1 and C.2

If the inoperable AC electric power sources cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

D.1

Condition D corresponds to a level of degradation in which all redundancy in the AC electrical power supplies has been lost. At this severely degraded level, any further losses in the AC electrical power system will cause a loss of function. Therefore, no additional time is justified for continued operation. The unit is required by LCO 3.0.3 to commence a controlled shutdown.

Condition is modified by a Note which permits delaying entry into the Condition for no longer than 2 hours to permit the testing required by SR 3.8.1.2 for the OPERABLE DG since this testing renders the DG inoperable.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with HBRSEP Design Criteria (Ref. 1). Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SRs for demonstrating the OPERABILITY of the DGs are consistent with the recommendations of Regulatory Guide 1.137 (Ref. 6), as addressed in the UFSAR.

Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. The minimum steady state output voltage of 467 V is 97% of the nominal 480 V output voltage. It allows for voltage drops to motors and other equipment down through the 120 V level where minimum operating voltage is also usually specified as 90% of name plate rating. The specified maximum steady state output voltage of 493 V is within the maximum operating voltage specified for the motors supplied by the 480 V subsystem. It ensures that for a lightly loaded distribution system, the voltage at the terminals of motors is no more than the maximum rated operating voltages. The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to ± 2% of the 60 Hz nominal frequency and are consistent with the recommendations given in Regulatory Guide 1.9 (Ref. 7).

SR 3.8.1.1

This SR ensures proper circuit continuity for the offsite AC electrical power supply to the onsite distribution network and availability of offsite AC electrical power. The breaker alignment verifies that each breaker is in its correct position to ensure that distribution buses and loads are connected to their preferred power source. The 7 day Frequency is adequate since breaker position is not likely to change without the operator being aware of it and because its status is displayed in the control room.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.2 and SR 3.8.1.7

These SRs help to ensure the availability of the standby electrical power supply to mitigate DBAs and transients and to maintain the unit in a safe shutdown condition.

To minimize the wear on moving parts that do not get lubricated when the engine is not running, these SRs are modified by a Note (Note 2 for SR 3.8.1.2) to indicate that all DG starts for these Surveillances may be preceded by an engine prelube period and followed by a warmup period prior to loading.

For the purposes of SR 3.8.1.2 and SR 3.8.1.7 testing, the DGs are started from standby conditions. Standby conditions for a DG mean that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

In order to reduce stress and wear on diesel engines, the manufacturer recommends a modified start in which the starting speed of DGs is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to synchronous speed prior to loading. These start procedures are the intent of Note 3, which is only applicable when such modified start procedures are recommended by the manufacturer.

SR 3.8.1.7 requires that, at a 184 day Frequency, the DG starts from standby conditions and achieves required voltage and frequency within 10 seconds. The minimum voltage and frequency stated in the SR are those necessary to ensure the DG can accept DBA loading while maintaining acceptable voltage and frequency levels. Stable operation at the nominal voltage and frequency values is also essential to establishing DG OPERABILITY, but a time constraint is not imposed. This is because a typical DG will experience a period of voltage and frequency oscillations prior to reaching steady state operation if these oscillations are not damped out by load application. This period may extend beyond the 10 second acceptance criteria and could be a cause for failing the SR. In lieu of a time constraint in the SR, HBRSEP Unit No. 2 will monitor and trend the actual time to reach steady state operation as a means of assuring there is no voltage regulator or governor degradation

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.2 and SR 3.8.1.7 (continued)

which could cause a DG to become inoperable. The 10 second start requirement supports the assumptions of the design basis LOCA analysis in the UFSAR, Chapter 15 (Ref. 4).

The 10 second start requirement is not applicable to SR 3.8.1.2 (see Note 3) when a modified start procedure as described above is used. If a modified start is not used, the 10 second start requirement of SR 3.8.1.7 applies.

Since SR 3.8.1.7 requires a 10 second start, it is more restrictive than SR 3.8.1.2, and it may be performed in lieu of SR 3.8.1.2. This is the intent of Note 1 of SR 3.8.1.2.

The 31 day Frequency for SR 3.8.1.2 is consistent with Regulatory Guide 1.9 (Ref. 7). The 184 day Frequency for SR 3.8.1.7 is a reduction in cold testing consistent with Generic Letter 84-15 (Ref. 5). These Frequencies provide adequate assurance of DG OPERABILITY, while minimizing degradation resulting from testing.

SR 3.8.1.3

This Surveillance verifies that the DGs are capable of synchronizing with the offsite electrical system and accepting loads approximating the design rating of the DGs. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the DG is connected to the offsite source.

Although no power factor requirements are established by this SR, the DG is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while the 1.0 is a physical limitation. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

The 31 day Frequency for this Surveillance is consistent with Regulatory Guide 1.9 (Ref. 7).

This SR is modified by five Notes. Note 1 indicates that diesel engine runs for this Surveillance may include gradual

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.3 (continued)

loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary transients, because of changing bus loads, do not invalidate this test. Similarly, momentary power factor transients above the limit do not invalidate the test. Note 3 indicates that this Surveillance should be conducted on only one DG at a time in order to avoid common cause failures that might result from offsite circuit or grid perturbations. Note 4 stipulates a prerequisite requirement for performance of this SR. A successful DG start must precede this test to credit satisfactory performance. Note 5 to this SR permits removal of the bypass for protective trips after the DG has properly assumed its loads on the bus. This reduces exposure of the DG to undue risk of damage that might render it inoperable.

SR 3.8.1.4

This SR provides verification that the level of fuel oil in the day tank is at or above the level at which fuel oil is automatically added. The level specified is 140 gallons, which is approximately equal to 1/2 full, and is selected to ensure adequate fuel oil for a minimum of 35 minutes of DG operation at full load plus 10%.

The 31 day Frequency is adequate to assure that a sufficient supply of fuel oil is available, since low level alarms are provided and facility operators would be aware of any large uses of fuel oil during this period.

SR 3.8.1.5

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the fuel oil day tanks once every 31 days eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, contaminated fuel oil, and

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.5 (continued)

breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. The Surveillance Frequencies are established by Regulatory Guide 1.137 (Ref. 6). This SR is for preventative maintenance. The presence of water does not necessarily represent failure of this SR, provided the accumulated water is removed during the performance of this Surveillance.

SR 3.8.1.6

This Surveillance demonstrates that each required fuel oil transfer pump operates and transfers fuel oil from the storage tank to its associated day tank. This is required to support continuous operation of standby power sources. This Surveillance provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control systems for automatic fuel transfer systems are OPERABLE.

The frequency of 31 days is based on the design of fuel transfer system. The pumps operate automatically in order to maintain an adequate volume of fuel oil in the day tanks during or following DG testing.

SR 3.8.1.7

See SR 3.8.1.2.

SR 3.8.1.8

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the DG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency and while maintaining a specified margin to

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.8 (continued)

the overspeed trip. For this unit, the single load for each DG is a safety injection pump rated at 380 Brake Horsepower. This Surveillance may be accomplished by:

a. Tripping the DG output breaker with the DG carrying greater than or equal to its associated single largest post-accident load while paralleled to offsite power, or while solely supplying the bus; or

b. Tripping its associated single largest post-accident load with the DG solely supplying the bus.

As required by IEEE-308 (Ref. 9, the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint, or 15% above synchronous speed, whichever is lower.

The time, voltage, and frequency tolerances specified in this SR are derived from Regulatory Guide 1.9 (Ref. 7) recommendations for response during load sequence intervals. The 3 seconds specified is equal to 60% of a typical 5 second load sequence interval associated with sequencing of the largest load. The voltage and frequency specified are consistent with the design range of the equipment powered by the DG. SR 3.8.1.8.a corresponds to the maximum frequency excursion, while SR 3.8.1.8.b and SR 3.8.1.8.c are steady state voltage and fequency values to which the system must recover following load rejection. The 18 month Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 8).

This SR is modified by two Notes. The reason for Note 1 is that during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. In order to ensure that the DG is tested under load conditions that are as close to design basis conditions as possible, Note 2 requires that, if synchronized to offsite power, testing must be performed using a power factor ≤ 0.9. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.9

This Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time.

The DG autostart time of 10 seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability is achieved.

The requirement to verify the connection and power supply of permanent and auto connected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, emergency Core Cooling Systems (ECCS) injection valves are not required to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or residual heat removal (RHR) systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG systems to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

This SR is modified by three Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

systems. Note 3 to this SR permits removal of the bypass for protective trips after the DG has properly assumed its loads on the bus. This reduces exposure of the DG to undue risk of damage that might render it inoperable.

SR 3.8.1.10

This Surveillance demonstrates that the DG automatically starts and achieves the required voltage and frequency within the specified time (10 seconds) from the design basis actuation signal (LOCA signal) and operates for ≥ 5 minutes. Stable operation at the nominal voltage and frequency values is also essential to establishing DG OPERABILITY, but a time constraint is not imposed. This is because a typical DG will experience a period of voltage and frequency oscillations prior to reaching steady state operation if these oscillations are not damped out by load application. This period may extend beyond the 10 second acceptance criteria and could be a cause for failing the SR. In lieu of a time constraint in the SR, HBRSEP Unit No. 2 will monitor and trend the actual time to reach steady state operation as a means of assuring there is no voltage regulator or governor degradation which could cause a DG to become inoperable. The 5 minute period provides sufficient time to demonstrate stability. SR 3.8.1.10.d and SR 3.8.1.10.e ensure that permanently connected loads and emergency loads are energized from the offsite electrical power system on an ESF signal without loss of offsite power.

The requirement to verify the connection of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, ECCS injection valves are not required to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or RHR systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.10 (continued)

series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of 18 months takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with the expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by three Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 is that during operation with the reactor critical, performance of this Surveillance could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. Note 3 to this SR permits removal of the bypass for protective trips after the DG has properly assumed its loads on the bus. This reduces exposure of the DG to undue risk of damage that might render it inoperable.

SR 3.8.1.11

This Surveillance demonstrates that DG noncritical protective functions (e.g., high coolant water temperature) are bypassed and critical protective functions (engine overspeed) trip the DG to avert substantial damage to the DG unit. A manual switch is provided which bypasses the non-critical trips. The noncritical trips are normally bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG. This SR is satisfied by simulating a trip signal to each of the

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.11 (continued)

non-critical trip devices and observing the DG does not receive a trip signal.

The 18 month Frequency is based on engineering judgment, taking into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.8.1.12

This SR requires demonstration once per 18 months that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours, ≥ 1.75 hours of which is at a load equivalent to 110% of the continuous duty rating and the remainder of the time at a load equivalent to the continuous duty rating of the DG. The DG start shall be a manually initiated start followed by manual syncronization with other power sources. Additionally, the DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelubricating and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR.

In order to ensure that the DG is tested under load conditions that are as close to design conditions as possible, testing must be performed using a power factor of ≤ 0.9. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. The 18 month Frequency takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This Surveillance is modified by three Notes. Note 1 states that momentary transients due to changing bus loads do not invalidate this test. Similarly, momentary power factor

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.12 (continued)

transients above the power factor limit will not invalidate the test. The reason for Note 2 is that during operation with the reactor critical, performance of this Surveillance could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. Note 3 to this SR permits removal of the bypass for protective trips after the DG has properly assumed its loads on the bus. This reduces exposure of the DG to undue risk of damage that might render it inoperable.

SR 3.8.1.13

This Surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve the required voltage and frequency within 10 seconds. The 10 second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA. Stable operation at the nominal voltage and frequency values is also essential to establishing DG OPERABILITY, but a time constraint is not imposed. This is because a typical DG will experience a period of voltage and frequency oscillations prior to reaching steady state operation if these oscillations are not damped out by load application. This period may extend beyond the 10 second acceptance criteria and could be a cause for failing the SR. In lieu of a time constraint in the SR, HBRSEP Unit No. 2 will monitor and trend the actual time to reach steady state operation as a means of assuring there is no voltage regulator or governor degradation which could cause a DG to become inoperable. The 18 month Frequency is based on engineering judgement and is intended to be consistent with expected fuel cycle lengths.

This SR is modified by two Notes. Note 1 ensures that the test is performed with the diesel sufficiently hot. The load band is provided to avoid routine overloading of the DG. Routine overloads may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. The requirement that the diesel has operated for at least 2 hours at full load conditions prior to performance of this Surveillance is

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.13 (continued)

based on manufacturer recommendations for achieving hot conditions. Momentary transients due to changing bus loads do not invalidate this test. Note 2 allows all DG starts to be preceded by an engine prelube period to minimize wear and tear on the diesel during testing.

SR 3.8.1.14

Under accident and loss of offsite power conditions, loads are sequentially connected to the bus by the automatic load sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. The 0.4 seconds load sequence time interval tolerance ensures that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated. Reference 2 provides a summary of the automatic loading of ESF buses.

The Frequency of 18 months takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems.

SR 3.8.1.15

In the event of a DBA coincident with a loss of offsite power, the DGs are required to supply the necessary power to ESF systems so that the fuel, RCS, and containment design limits are not exceeded.

This Surveillance demonstrates the DG operation, as discussed in the Bases for SR 3.8.1.9, during a loss of offsite power actuation test signal in conjunction with an ESF actuation signal. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.15 (continued)

functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of 18 months takes into consideration unit conditions required to perform the Surveillance and is intended to be consistent with an expected fuel cycle length of 18 months.

This SR is modified by three Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations for DGs. The reason for Note 2 is that the performance of the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. Note 3 to this SR permits removal of the bypass for protective trips after the DG has properly assumed its loads on the bus. This reduces exposure of the DG to undue risk of damage that might render it inoperable.

SR 3.8.1.16

Transfer of the 4.160 kV bus 2 power supply from the auxiliary transformer to the start up transformer demonstrates the OPERABILITY of the offsite circuit network to power the shutdown loads. In lieu of actually initiating a circuit transfer, testing that adequately shows the capability of the transfer is acceptable. This transfer testing may include any sequence of sequential, overlapping, or total steps so that the entire transfer sequence is verified. The 18 month Frequency is based on engineering judgement taking into consideration the plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle length.

This SR is modified by two Notes. The reason for Note 1 is that, during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.16 (continued)

safety systems. As stated in Note 2, automatic transfer capability to the SUT is not required to be met when the associated 4.160 kV bus and Emergency Bus are powered from the SUT. This is acceptable since the automatic transfer capability function has been satisfied in this condition.

SR 3.8.1.17

This Surveillance demonstrates that the DG starting independence has not been compromised. Also, this Surveillance demonstrates that each engine can achieve proper speed within the specified time when the DGs are started simultaneously. Stable operation at the nominal voltage and frequency values is also essential to establishing DG OPERABILITY, but a time constraint is not imposed. This is because a typical DG will experience a period of voltage and frequency oscillations prior to reaching steady state operation if these oscillations are not damped out by load application. This period may extend beyond the 10 second acceptance criteria and could be a cause for failing the SR. In lieu of a time constraint in the SR, HBRSEP Unit No. 2 will monitor and trend the actual time to reach steady state operation as a means of assuring there is no voltage regulator or governor degradation which could cause a DG to become inoperable.

The 10 year Frequency is based on engineering judgement.

This SR is modified by a Note. The reason for the Note is to minimize wear on the DG during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations.

REFERENCES

1. UFSAR, Section 3.1.

2. UFSAR, Chapter 8.

3. UFSAR, Chapter 6.

(continued)

BASES

REFERENCES (continued)

4. UFSAR, Chapter 15.

5. Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," July 2, 1984.

6. Regulatory Guide 1.137, Rev. 1, October 1979.

7. Regulatory Guide 1.9, Rev. 3, July 1993.

8. Regulatory Guide 1.108, Rev. 1, August 1977.

9. IEEE Standard 308-1978.

10. Regulatory Guide 1.93, Rev. 0, December 1974.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.2 AC Sources – Shutdown

BASES

BACKGROUND

A description of the AC sources is provided in the Bases for LCO 3.8.1, "AC Sources – Operating."

APPLICABLE SAFETY ANALYSES

The OPERABILITY of the minimum AC sources during MODES 5 and 6 and during movement of irradiated fuel assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate AC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many Design Basis Accidents (DBAs) that are analyzed in MODES 1, 2, 3, and 4 have no specific analyses in MODES 5 and 6. Worst case bounding events are deemed not credible in MODES 5 and 6 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

During MODES 1, 2, 3, and 4, various deviations from the analysis assumptions and design requirements are allowed within the Required Actions. This allowance is in

(continued)

BASES

APPLICABLE SAFETY ANALYSIS (continued)

recognition that certain testing and maintenance activities must be conducted provided an acceptable level of risk is not exceeded. During MODES 5 and 6, performance of a significant number of required testing and maintenance activities is also required. In MODES 5 and 6, the activities are generally planned and administratively controlled. Relaxations from MODE 1, 2, 3, and 4 LCO requirements are acceptable during shutdown modes based on:

a. The fact that time in an outage is limited. This is a risk prudent goal as well as a utility economic consideration.

b. Requiring appropriate compensatory measures for certain conditions. These may include administrative controls, reliance on systems that do not necessarily meet typical design requirements applied to systems credited in operating MODE analyses, or both.

c. Prudent utility consideration of the risk associated with multiple activities that could affect multiple systems.

d. Maintaining, to the extent practical, the ability to perform required functions (even if not meeting MODE 1, 2, 3, and 4 OPERABILITY requirements) with systems assumed to function during an event.

In the event of an accident during shutdown, this LCO ensures the capability to support systems necessary to avoid immediate difficulty, assuming either a loss of all offsite power or a loss of all onsite diesel generator (DG) power.

The AC sources satisfy Criterion 3 of the NRC Policy Statement.

LCO

One offsite circuit capable of supplying the onsite power distribution subsystem(s) of LCO 3.8.10, "Distribution Systems – Shutdown" ensures that all required loads are powered from offsite power. An OPERABLE DG, associated with the distribution system train required to be OPERABLE by LCO 3.8.10, ensures a diverse power source is available to provide electrical power support, assuming a loss of the offsite circuit. Together, OPERABILITY of the required

(continued)

BASES

LCO (continued)

offsite circuit and DG ensures the availability of sufficient AC sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

The qualified offsite circuit must be capable of maintaining rated frequency and voltage within limits, and accepting required loads during an accident, while connected to the Engineered Safety Feature (ESF) bus(es). Qualified offsite circuits are those that are described in the UFSAR and are part of the licensing basis for the unit.

The DG must be capable of starting, accelerating to rated speed and voltage, and connecting to its respective ESF bus on detection of bus undervoltage. This sequence must be accomplished within 10 seconds. The DG must be capable of accepting required loads within the assumed loading sequence intervals, and continue to operate until offsite power can be restored to the ESF buses. These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot and DG in standby at ambient conditions.

Proper sequencing of loads, including tripping of nonessential loads, is a required function for DG OPERABILITY.

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

(continued)

BASES

APPLICABILITY (continued)

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.1.

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4 the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving fuel assemblies while in MODE 1, 2, 3, or 4 the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of irradiated fuel assemblies would not be sufficient reason to require a reactor shutdown.

A.1

An offsite circuit would be considered inoperable if it were not available to one required ESF train. Although two trains are required by LCO 3.8.10, the one train with offsite power available may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and fuel movement. By the allowance of the option to declare required features inoperable, with the circuit inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCO's ACTIONS.

With the offsite circuit not available to all required trains, the option would still exist to declare all required features inoperable. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made. With the required DG inoperable, the minimum required diversity of AC power sources is not available. It is, therefore, required to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions. The Required Action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory provided the required SDM is maintained.

(continued)

BASES

ACTIONS

A.1 (continued)

Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability or the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC sources and to continue this action until restoration is accomplished in order to provide the necessary AC power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required AC electrical power sources should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

Pursuant to LCO 3.0.6, the Distribution System's ACTIONS would not be entered even if all AC sources to it are inoperable, resulting in de-energization. Therefore, the Required Actions of Condition A are modified by a Note to indicate that when Condition A is entered with no AC power to any required ESF bus, the ACTIONS for LCO 3.8.10 must be immediately entered. This Note allows Condition A to provide requirements for the loss of the offsite circuit, whether or not a train is de-energized. LCO 3.8.10 would provide the appropriate restrictions for the situation involving a de-energized train.

SURVEILLANCE REQUIREMENTS

SR 3.8.2.1

SR 3.8.2.1 requires the SRs from LCO 3.8.1 that are necessary for ensuring the OPERABILITY of the AC sources in other than MODES 1, 2, 3, and 4. SR 3.8.1.5 is not required to be met since only one offsite circuit is required to be OPERABLE. SR 3.8.1.6 is excepted because starting independence is not required with the DG(s) that is not required to be operable.

This SR'is modified by a Note. The reason for the Note is to minimize the frequency of requiring the OPERABLE DG(s) from being paralleled with the offsite power network or otherwise rendered inoperable during performance of SRs, and

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.2.1 (continued)

to minimize the frequency of deenergizing a required 480 V ESF bus or disconnecting a required offsite circuit during performance of SRs. With limited AC sources available, a single event could compromise both the required circuit and the DG. It is the intent that these SRs must still be capable of being met, but actual performance is not required during periods when the DG and offsite circuit is required to be OPERABLE. Refer to the corresponding Bases for LCO 3.8.1 for a discussion of each SR.

REFERENCES

None.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.3 Diesel Fuel Oil and Starting Air

BASES

BACKGROUND

The diesel generators (DG) are provided with a fuel oil storage capacity sufficient to operate one diesel for a period of 7 days while the DG is supplying full load. This onsite fuel oil capacity is sufficient to operate the DGs for longer than the time to replenish the onsite supply from outside sources.

A 275 gallon day tank is located at each of the units. The level in the day tanks is maintained by two electric motor driven transfer pumps taking suction on the 25,000 gallon storage tank. A minimum of 34,000 gallons of fuel oil is maintained on site. This is sufficient to operate one diesel at full load for seven days.

Additional supplies of diesel oil are available in the Hartsville area and from port terminals at Charleston, SC, Wilmington, NC, Fayetteville, NC and Raleigh, NC. Ample trucking facilities exist to assure deliveries to the site within eight hours. Diesel fuel is also available from the internal combustion turbine diesel fuel oil storage tanks (approximately 95,000 gallon total capacity) located at the site and connections are provided for fuel oil transferral to the Unit 2 diesel fuel oil storage tank.

For proper operation of the standby DGs, it is necessary to ensure the proper quality of the fuel oil. The Diesel Fuel Oil Testing Program provides appropriate testing requirements for DG fuel oil. The fuel oil properties governed by these SRs are the water and sediment content, the kinematic viscosity, and specific gravity (or API gravity).

Each DG has an air start system with adequate capacity for eight successive start attempts on the DG without recharging the air start receiver(s).

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 6 (Ref. 1), and in the UFSAR, Chapter 15 (Ref. 2), assume Engineered Safety Feature (ESF) systems are OPERABLE. The DGs are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that fuel, Reactor Coolant System and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

Since diesel fuel oil and the air start subsystem support the operation of the standby AC power sources, they satisfy Criterion 3 of the NRC Policy Statement.

LCO

Stored diesel fuel oil is required to have sufficient supply for 7 days of full load operation. It is also required to meet specific standards for quality. This requirement, in conjunction with an ability to obtain replacement supplies within 7 days, supports the availability of DGs required to shut down the reactor and to maintain it in a safe condition for an anticipated operational occurrence (AOO) or a postulated DBA with loss of offsite power. DG day tank fuel requirements, as well as transfer capability from the storage tank to the day tank, are addressed in LCO 3.8.1, "AC Sources - Operating," and LCO 3.8.2, "AC Sources - Shutdown and During Movement of Irradiated Fuel Assemblies."

The starting air system is required to have a minimum capacity for eight successive DG start attempts without recharging the air start receivers.

APPLICABILITY

The AC sources (LCO 3.8.1 and LCO 3.8.2) are required to ensure the availability of the required power to shut down the reactor and maintain it in a safe shutdown condition after an AOO or a postulated DBA. Since stored diesel fuel oil, and the starting air subsystem support LCO 3.8.1 and LCO 3.8.2, stored diesel fuel oil and starting air are

(continued)

BASES

APPLICABILITY (continued)

required to be within limits when the associated DG is required to be OPERABLE.

ACTIONS

The ACTIONS Table is modified by a Note indicating that separate Condition entry is allowed for each DG. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable DG subsystem. Complying with the Required Actions for one inoperable DG subsystem may allow for continued operation, and subsequent inoperable DG subsystem(s) are governed by separate Condition entry and application of associated Required Actions.

A.1 and B.1

In these Conditions, the 7 day fuel oil supply for a DG is not available. However, the Condition is restricted to fuel oil level reductions that maintain at least a 6 day supply. These circumstances may be caused by events, such as full load operation required after an inadvertent start while at minimum required level, or feed and bleed operations, which may be necessitated by increasing particulate levels or any number of other oil quality degradations. This restriction allows sufficient time for obtaining the requisite replacement volume and performing the analyses required prior to addition of fuel oil to the Unit 2 DG fuel oil tank. A period of 48 hours is considered sufficient to complete restoration of the required level prior to declaring the DGs inoperable. This period is acceptable based on the remaining capacity (> 6 days), the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period.

C.1

With the new fuel oil properties defined in the Bases for SR 3.8.3.2 not within the required limits, a period of 30 days is allowed for restoring the stored fuel oil properties. This period provides sufficient time to test the stored fuel oil to determine that the new fuel oil, when mixed with previously stored fuel oil, remains acceptable, or to restore the stored fuel oil properties. This restoration

(continued)

BASES

ACTIONS

C.1 (continued)

may involve feed and bleed procedures, filtering, or combinations of these procedures. Even if a DG start and load was required during this time interval and the fuel oil properties were outside limits, there is a high likelihood that the DG would still be capable of performing its intended function.

D.1

With starting air receiver pressure < 210 psig, sufficient capacity for eight successive DG start attempts does not exist. However, as long as the receiver pressure is > 100 psig, there is adequate capacity for at least one start attempt, and the DG can be considered OPERABLE while the air receiver pressure is restored to the required limit. A period of 48 hours is considered sufficient to complete restoration to the required pressure prior to declaring the DG inoperable. This period is acceptable based on the remaining air start capacity, the fact that most DG starts are accomplished on the first attempt, and the low probability of an event during this brief period.

E.1

With a Required Action and associated Completion Time not met, or one or more DG's fuel oil, or starting air subsystem not within limits for reasons other than addressed by Conditions A through D, the associated DGs may be incapable of performing its intended function and must be immediately declared inoperable.

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1

This SR provides verification that there is an adequate inventory of fuel oil in the storage tanks to support one DG's operation for 7 days at full load. The 7 day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an offsite location.

(continued)

BASES

SURVEILLANCE REQURIEMENTS

SR 3.8.3.1 (continued)

The 7 day Frequency is adequate to ensure that a sufficient supply of fuel oil is available, since low level alarms are provided for the U2 DG fuel oil tank and unit operators would be aware of any large uses of fuel oil during this period.

SR 3.8.3.2

The tests listed in the Diesel Fuel Oil Testing Program (API or Specific Gravity, Cloud Point, Water and Sediment, and Viscosity) are a means of determining whether fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion. If results from these tests are within acceptable limits, the fuel oil is acceptable for use. New fuel oil received for storage in the Unit 1 I-C turbine fuel oil storage tank and subsequently transferred to the Unit 2 DG fuel oil storage tank is verified to meet the limits below prior to adding to the Unit 1 I-C storage tanks either by verifying the integrity of the seal on the tank truck against the certificate of compliance or by testing of the fuel oil on the truck prior to transfer. Additionally, stored fuel in the Unit 1 I-C storage tank and in the Unit 2 DG fuel oil storage tank is tested every 31 days. The sampling methodology, tests, and limits are as follows:

a. Sampling of three vertical IC Turbine tanks is performed as a single entity by recirculating the tanks and sampling at the Unit 1 transfer pump discharge. Sampling of the remaining vertical Unit 1 tank is performed independently from the bottom drain connection. Sampling of the Unit 2 DG fuel oil storage tank is performed from the discharge from the fuel oil storage tank transfer pump (Ref.3); and

b. Verify in accordance with applicable ASTM standards that the sample has an API gravity of ≥ 28, a Saybolt viscosity at 100°F of ≥ 32 SUS and ≤ 50 SUS, water and sediment ≤ 0.10%, and cloud point ≤ 23°F.

Failure to meet any of the limits is cause for rejecting the fuel oil.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.3.3

This Surveillance ensures that, without the aid of the refill compressor, sufficient air start capacity for each DG is available. The system design requirements provide for a minimum of eight engine start cycles without recharging. The pressure specified in this SR is intended to reflect the lowest value at which the eight starts can be accomplished.

The 31 day Frequency takes into account the capacity, capability, redundancy, and diversity of the AC sources and other indications available in the control room, including alarms, to alert the operator to below normal air start pressure.

SR 3.8.3.4

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the Unit 2 DG fuel storage tank once every 31 days eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, and contaminated fuel oil, and from breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. This SR is for preventive maintenance. The presence of water does not necessarily represent failure of this SR, provided the accumulated water is removed during performance of the Surveillance.

REFERENCES

1. UFSAR, Chapter 6.

2. UFSAR, Chapter 15.

3. CP&L Letter to NRC dated November 20, 1981, "Quality Assurance Requirements Regarding Diesel Generator Fuel Oil."

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.4 DC Sources - Operating

BASES

BACKGROUND

The station DC electrical power system provides the AC emergency power system with control power. It also provides both motive and control power to selected safety related equipment and preferred AC instrument bus power (via inverters). As required by HBRSEP Design Criteria (Ref. 1), the DC electrical power system is designed to have sufficient independence, redundancy, and testability to perform its safety functions, assuming a single active failure.

The 125 VDC electrical power system consists of two separate and redundant safety related DC electrical power subsystems (Train A and Train B). Each subsystem consists of one station 125 VDC battery, the battery charger for the battery (battery charger A for A station battery and battery charger B for the B station battery), and all the associated control equipment and interconnecting cabling.

Additionally there is one spare battery charger per subsystem (A-1 for Train A and B-1 for Train B), which provides backup service in the event that the preferred battery charger is out of service. If the spare battery charger is substituted for one of the preferred battery chargers, then the requirements of redundancy between subsystems are maintained.

During normal operation, the 125 VDC load is powered from the battery chargers with the batteries floating on the system. In case of loss of normal AC power to the battery charger, the battery charger trips and the DC load is automatically powered from the station batteries. The battery charger must be manually restarted when power is restored.

The Train A and Train B DC electrical power subsystems provide the control power for its associated AC power load group, 4.16 kV switchgear, and 480 V breakers. The DC electrical power subsystems also provide DC electrical power to the inverters, which in turn power four of the eight instrument buses.

(continued)

BASES

BACKGROUND (continued)

The DC power distribution system is described in more detail in Bases for LCO 3.8.9, "Distribution System - Operating," and LCO 3.8.10, "Distribution Systems - Shutdown and During Movement of Irradiated Fuel Assemblies."

Each battery has adequate storage capacity to carry the required load continuously for at least 1 hour (Ref. 1).

There is no sharing between redundant subsystems, such as batteries, battery chargers, or distribution panels.

The battery for Train A DC electrical power subsystem is sized to produce required capacity at 80% of nameplate rating, corresponding to warranted capacity at end of life cycles and the 100% design demand. Battery size is based on 125% of required capacity and, after selection of an available commercial battery, results in a battery capacity in excess of 150% of required capacity. The battery for Train B DC electrical power subsystem is sized to produce required capacity at 91% of nameplate rating, corresponding to warranted capacity at end of life cycles and the 100% design demand. Battery size is based on 110% of required capacity and, after selection of an available commercial battery, results in a battery capacity in excess of 120% of required capacity. The voltage limit is 2.13 V per cell, which corresponds to a total minimum voltage output of 128 V per battery discussed in the UFSAR, Chapter 8 (Ref. 2).

Each Train A and Train B DC electrical power subsystem has ample power output capacity for the steady state operation of connected loads required during normal operation, while at the same time maintaining its battery bank fully charged. Each battery charger also has sufficient capacity to restore the battery from a partial discharge condition to its fully charged state within 24 hours while supplying normal steady state loads discussed in the UFSAR, Chapter 8 (Ref. 2).

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 6 (Ref. 3), and in the UFSAR, Chapter 15 (Ref. 4), assume that Engineered Safety Feature (ESF) systems are OPERABLE. The DC electrical power system provides normal and emergency DC

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation. The OPERABILITY of the DC sources is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining the DC sources OPERABLE during accident conditions in the event of:

a. An assumed loss of all offsite AC power or all onsite AC power; or

b. An assumed loss of offsite power and a worst case single active failure.

The DC sources satisfy Criterion 3 of the NRC Policy Statement.

LCO

The DC electrical power subsystems, each subsystem consisting of one battery, battery charger and the corresponding control equipment and interconnecting cabling supplying power to the associated bus within the train are required to be OPERABLE to ensure the availability of the required power to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence (AOO) or a postulated DBA. Loss of any train DC electrical power subsystem does not prevent the minimum safety function from being performed (Ref. 4).

An OPERABLE DC electrical power subsystem requires the battery and one of the two associated chargers to be operating and connected to the associated DC bus(es).

APPLICABILITY

The DC electrical power sources are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure safe unit operation and to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

b. Adequate core cooling is provided, and containment integrity and other instrument functions are

(continued)

BASES

APPLICABILITY (continued)

maintained in the event of a postulated DBA. The DC electrical power requirements for MODES 5 and 6 are addressed in the Bases for LCO 3.8.5, "DC Sources - Shutdown and During Movement of Irradiated Fuel Assemblies."

ACTIONS

A.1

Condition A represents one train with a loss of ability to completely respond to an event, and a potential loss of ability to remain energized during normal operation. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for complete loss of DC power to the affected train. The 2 hour limit is consistent with the allowed time for an inoperable DC distribution system train.

If one of the required DC electrical power subsystems is inoperable (e.g., inoperable battery, inoperable battery charger(s), or inoperable battery charger and associated inoperable battery), the remaining DC electrical power subsystem has the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst case single active failure would, however, result in the complete loss of the remaining 125 VDC electrical power subsystems with attendant loss of ESF functions, continued power operation should not exceed 2 hours. The 2 hour Completion Time reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power subsystem and, if the DC electrical power subsystem is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown.

B.1 and B.2

If the inoperable DC electrical power subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the

(continued)

BASES

ACTIONS

B.1 and B.2 (continued)

required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the charging system and the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery (or battery cell) and maintain the battery (or a battery cell) in a fully charged state. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the initial voltages assumed in the battery sizing calculations. The 7 day Frequency is consistent with manufacturer recommendations and IEEE-450 (Ref. 5).

SR 3.8.4.2

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance.

The 18 month frequency is based on engineering judgement and operational experience and is sufficient to detect battery and rack degradation on a long term basis.

SR 3.8.4.3

Visual inspection of intercell, intertier, and terminal connections provide an indication of physical damage or abnormal deterioration that could indicate degraded battery condition. The anticorrosion material is used to help ensure good electrical connections and to reduce terminal deterioration. The visual inspection for corrosion is not intended to require removal of and inspection under each

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.3 (continued)

terminal connection. The removal of visible corrosion is a preventive maintenance SR. The presence of visible corrosion does not necessarily represent a failure of this SR provided visible corrosion is removed during performance of SR 3.8.4.3.

The 18 month frequency is based on engineering judgement taking into consideration the likelihood of a change in component or system status.

SR 3.8.4.4

This SR requires that each battery charger be capable of supplying 300 amps and 125 V for ≥ 4 hours. These current and voltage requirements are based on the design capacity of the chargers. The battery charger supply is based on normal DC loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state. The minimum required amperes and duration ensures that these requirements can be satisfied.

The Surveillance Frequency is acceptable, given the other administrative controls existing to ensure adequate charger performance during these 18 month intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

SR 3.8.4.5

A battery service test is a special test of battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements.

This SR is modified by two Notes. Note 1 allows the performance of a performance discharge test in lieu of a service test once per 75 months.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.5 (continued)

The reason for Note 2 is that performing the Surveillance would perturb the electrical distribution system and challenge safety systems.

SR 3.8.4.6

A battery performance discharge test is a test of constant current capacity of a battery, normally done in the as found condition, after having been in service, to detect any change in the capacity determined by the acceptance test. The test is intended to determine overall battery degradation due to age and usage.

The performance discharge test may be used to satisfy SR 3.8.4.6 while satisfying the requirements of SR 3.8.4.5 at the same time.

The acceptance criteria for this Surveillance are consistent with IEEE-450 (Ref. 5). These references recommend that the battery be replaced if its capacity is below 80% of the manufacturer's rating. A capacity of 80% shows that the battery rate of deterioration is increasing, even if there is ample capacity to meet the load requirements. An acceptance criterion of 80% of rated capacity is applicable to the "A" battery only. An acceptance criterion of 91% is applicable to the "B" battery since the design margin is not as great.

The Surveillance Frequency for this test is normally 60 months. If the battery shows degradation, or if the battery has reached 85% for Battery "A" or 95% for Battery "B" of its expected life, the Surveillance Frequency is reduced to 18 months. Degradation is indicated, according to IEEE-450 (Ref. 5), when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is ≥ 10% below the manufacturer's rating. These Frequencies are generally consistent with the recommendations in IEEE-450 (Ref. 5) with an extra allowance for a 18 month test frequency for batteries which have shown degradation or have reached 85% for battery "A" and 95% for battery "B" of expected life.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.6 (continued)

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would perturb the electrical distribution system and challenge safety systems.

REFERENCES

1. UFSAR Section 3.1.
2. UFSAR, Chapter 8.
3. UFSAR, Chapter 6.
4. UFSAR, Chapter 15.
4. Regulatory Guide 1.93, December 1974.
6. IEEE-450-1980.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.5 DC Sources – Shutdown

BASES

BACKGROUND

A description of the DC sources is provided in the Bases for LCO 3.8.4, "DC Sources – Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume that Engineered Safety Feature systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the diesel generators, emergency auxiliaries, and control and switching during all MODES of operation.

The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum DC electrical power sources during MODES 5 and 6 and during movement of irradiated fuel assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate DC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

The DC sources satisfy Criterion 3 of the NRC Policy Statement.

(continued)

BASES (continued)

LCO

The DC electrical power subsystems, each subsystem consisting of one battery, a battery charger, and the corresponding control equipment and interconnecting cabling within the train, are required to be OPERABLE to support required trains of the distribution systems required OPERABLE by LCO 3.8.10, "Distribution Systems - Shutdown." This ensures the availability of sufficient DC electrical power sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

APPLICABILITY

The DC electrical power sources required to be OPERABLE in MODES 5 and 6, and during movement of irradiated fuel assemblies, provide assurance that:

a. Required features to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core;

b. Required features needed to mitigate a fuel handling accident are available;

c. Required features necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The DC electrical power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.4.

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving fuel assemblies while in MODE 1, 2, 3, or 4 the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of irradiated fuel assemblies would not be sufficient reason to require a reactor shutdown.

(continued)

BASES (continued)

ACTIONS (continued)

A.1, A.2.1, A.2.2, A.2.3, and A.2.4

If two trains are required by LCO 3.8.10, the remaining train with DC power available may be capable of supporting sufficient systems to allow continuation of CORE ALTERATIONS and fuel movement. By allowing the option to declare required features inoperable with the associated DC power source(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCO ACTIONS. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions). The Required Action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory, provided the required SDM is maintained.

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required DC electrical power subsystems and to continue this action until restoration is accomplished in order to provide the necessary DC electrical power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required DC electrical power subsystems should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

SURVEILLANCE REQUIREMENTS

SR 3.8.5.1

SR 3.8.5.1 requires performance of all Surveillances required by SR 3.8.4.1 through SR 3.8.4.6. Therefore, see the corresponding Bases for LCO 3.8.4 for a discussion of each SR.

This SR is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DC sources from being discharged below their capability to provide the required

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS	SR 3.8.5.1 (continued) power supply or otherwise rendered inoperable during the performance of SRs. It is the intent that these SRs must still be capable of being met, but actual performance is not required.
REFERENCES	1. UFSAR, Chapter 6. 2. UFSAR, Chapter 15.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.6 Battery Cell Parameters

BASES

BACKGROUND

This LCO delineates the limits on electrolyte temperature, level, float voltage, and specific gravity for the DC power source batteries. A discussion of these batteries and their OPERABILITY requirements is provided in the Bases for LCO 3.8.4, "DC Sources - Operating," and LCO 3.8.5, "DC Sources - Shutdown and During Movement of Irradiated Fuel Assemblies."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume Engineered Safety Feature systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the diesel generators, emergency auxiliaries, and control and switching during all MODES of operation.

The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining at least one train of DC sources OPERABLE during accident conditions, in the event of:

a. An assumed loss of all offsite AC power or all onsite AC power; or

b. An assumed loss of offsite power and a worst case single active failure.

Battery cell parameters satisfy the Criterion 3 of the NRC Policy Statement.

LCO

Battery cell parameters must remain within acceptable limits to ensure availability of the required DC power to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated DBA. Electrolyte limits are conservatively established,

(continued)

BASES

LCO (continued)

allowing continued DC electrical system function even with Category A and B limits not met.

APPLICABILITY

The battery cell parameters are required solely for the support of the associated DC electrical power subsystems. Therefore, battery electrolyte is only required when the DC power source is required to be OPERABLE. Refer to the Applicability discussion in Bases for LCO 3.8.4 and LCO 3.8.5.

ACTIONS

A.1, A.2, and A.3

With one or more cells in one or more batteries not within limits (i.e., Category A limits not met, Category B limits not met, or Category A and B limits not met) but within the Category C limits specified in Table 3.8.6-1 in the accompanying LCO, the battery is degraded but there is still sufficient capacity to perform the intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of Category A or B limits not met and operation is permitted for a limited period.

The pilot cell electrolyte level and float voltage are required to be verified to meet the Category C limits within 1 hour (Required Action A.1). This check will provide a quick indication of the status of the remainder of the battery cells. One hour provides time to inspect the electrolyte level and to confirm the float voltage of the pilot cells. One hour is considered a reasonable amount of time to perform the required verification.

Verification that the Category C limits are met (Required Action A.2) provides assurance that during the time needed to restore the parameters to the Category A and B limits, the battery is still capable of performing its intended function. A period of 24 hours is allowed to complete the initial verification because specific gravity measurements must be obtained for each connected cell. Taking into consideration both the time required to perform the required verification and the assurance that the battery cell parameters are not severely degraded, this time is

(continued)

BASES

ACTIONS

A.1, A.2, and A.3 (continued)

considered reasonable. The verification is repeated at 7 day intervals until the parameters are restored to Category A or B limits. This periodic verification is consistent with the normal Frequency of pilot cell Surveillances.

Continued operation is only permitted for 31 days before battery cell parameters must be restored to within Category A and B limits. With the consideration that, while battery capacity is degraded, sufficient capacity exists to perform the intended function and to allow time to fully restore the battery cell parameters to normal limits, this time is acceptable prior to declaring the battery inoperable.

B.1

With one or more batteries with one or more battery cell parameters outside the Category C limit for any connected cell, sufficient capacity to supply the maximum expected load requirement is not assured and the corresponding DC electrical power subsystem must be declared inoperable. Additionally, other potentially extreme conditions, such as not completing the Required Actions of Condition A within the required Completion Time or average electrolyte temperature of representative cells falling below 55°F for the "A" battery and 67°F for the "B" battery, are also cause for immediately declaring the associated DC electrical power subsystem inoperable.

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

This SR verifies that Category A battery cell parameters are consistent with IEEE-450 (Ref. 3), which recommends regular battery inspections (at least one per month) including voltage (measured to the nearest 0.01 Volts), specific gravity, and electrolyte temperature of pilot cells. In addition, if water is added to any pilot cell, the amount must be recorded. Data attained must be compared to the data from the previous SR to detect signs of abuse or deterioration.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.6.2

The quarterly inspection of specific gravity and voltage is consistent with IEEE-450 (Ref. 3). In addition, within 24 hours of a battery discharge < 110 V or a battery overcharge > 150 V, the battery must be demonstrated to meet Category B limits. Transients, which may momentarily cause battery voltage to drop to ≤ 110 V, do not constitute a battery discharge provided the battery terminal voltage and float current return to pre-transient values. This inspection is also consistent with IEEE-450 (Ref. 3), which recommends special inspections following a severe discharge or overcharge, to ensure that no significant degradation of the battery occurs as a consequence of such discharge or overcharge. If water is added to any battery cell, the amount must be recorded. Data obtained must be compared to the data from the previous SR to detect signs of abuse or deterioration.

SR 3.8.6.3

This Surveillance verification that the average temperature of representative cells is ≥ 55°F for the "A" battery and ≥ 67°F for the "B" battery, is consistent with a recommendation of IEEE-450 (Ref. 3), that states that the temperature of electrolytes in representative cells should be determined on a quarterly basis. Data obtained must be compared to the data from the previous SR to detect signs of abuse or deterioration.

Lower than normal temperatures act to inhibit or reduce battery capacity. This SR ensures that the operating temperatures remain within an acceptable operating range. This limit is based on manufacturer recommendations.

Table 3.8.6-1

This table delineates the limits on electrolyte level, float voltage, and specific gravity for three different categories. The meaning of each category is discussed below.

Category A defines the normal parameter limit for each designated pilot cell in each battery. The cells selected

(continued)

BASES

SURVEILLANCE REQUIREMENTS

Table 3.8.6-1 (continued)

as pilot cells are those whose temperature, voltage, and electrolyte specific gravity approximate the state of charge of the entire battery.

The Category A limits specified for electrolyte level are based on manufacturer recommendations and are consistent with the guidance in IEEE-450 (Ref. 3), with the extra ¼ inch allowance above the high water level indication for operating margin to account for temperatures and charge effects. In addition to this allowance, footnote a to Table 3.8.6-1 permits the electrolyte level to be above the specified maximum level during equalizing charge, provided it is not overflowing. These limits ensure that the plates suffer no physical damage, and that adequate electron transfer capability is maintained in the event of transient conditions. IEEE-450 (Ref. 3) recommends that electrolyte level readings should be made only after the battery has been at float charge for at least 72 hours.

The Category A limit specified for float voltage is ≥ 2.13 V per cell. This value is based on the recommendations of IEEE-450 (Ref. 3), which states that prolonged operation of cells < 2.13 V can reduce the life expectancy of cells.

The Category A limit specified for specific gravity for each pilot cell is ≥ 1.200 (0.015 below the manufacturer fully charged nominal specific gravity or a battery charging current that had stabilized at a low value). This value is characteristic of a charged cell with adequate capacity. According to IEEE-450 (Ref. 3), the specific gravity readings are based on a temperature of 77°F (25°C).

The specific gravity readings are corrected for actual electrolyte temperature and level. For each 3°F (1.67°C) above 77°F (25°C), 1 point (0.001) is added to the reading; 1 point is subtracted for each 3°F below 77°F. The specific gravity of the electrolyte in a cell increases with a loss of water due to electrolysis or evaporation.

Category B defines the normal parameter limits for each connected cell. The term "connected cell" excludes any battery cell that may be jumpered out.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

Table 3.8.6-1 (continued)

The Category B limits specified for electrolyte level and float voltage are the same as those specified for Category A and have been discussed above. The Category B limit specified for specific gravity for each connected cell is ≥ 1.195 (0.020 below the manufacturer fully charged, nominal specific gravity) with the average of all connected cells > 1.205 (0.010 below the manufacturer fully charged, nominal specific gravity). These values are based on manufacturer's recommendations. The minimum specific gravity value required for each cell ensures that the effects of a highly charged or newly installed cell will not mask overall degradation of the battery.

Category C defines the limits for each connected cell. These values, although reduced, provide assurance that sufficient capacity exists to perform the intended function and maintain a margin of safety. When any battery parameter is outside the Category C limits, the assurance of sufficient capacity described above no longer exists, and the battery must be declared inoperable.

The Category C limits specified for electrolyte level (above the top of the plates and not overflowing) ensure that the plates suffer no physical damage and maintain adequate electron transfer capability. The Category C limits for float voltage is based on IEEE-450 (Ref. 3), which states that a cell voltage of 2.07 V or below, under float conditions and not caused by elevated temperature of the cell, indicates internal cell problems and may require cell replacement.

The Category C limit of average specific gravity ≥ 1.195 is based on manufacturer recommendations (0.020 below the manufacturer recommended fully charged, nominal specific gravity). In addition to that limit, it is required that the specific gravity for each connected cell must be no less than 0.020 below the average of all connected cells. This limit ensures that the effect of a highly charged or new cell does not mask overall degradation of the battery.
The footnotes to Table 3.8.6-1 are applicable to Category A, B, and C specific gravity. Footnote (b) to Table 3.8.6-1 requires the above mentioned correction for electrolyte level and temperature, with the exception that

(continued)

BASES

SURVEILLANCE REQUIREMENTS

Table 3.8.6-1 (continued)

level correction is not required when battery charging current is < 2 amps on float charge. This current provides, in general, an indication of overall battery condition.

Because of specific gravity gradients that are produced during the recharging process, delays of several days may occur while waiting for the specific gravity to stabilize. A stabilized charger current is an acceptable alternative to specific gravity measurement for determining the state of charge. This phenomenon is discussed in IEEE-450 (Ref. 3). Footnote (c) to Table 3.8.6-1 allows the float charge current to be used as an alternate to specific gravity for up to 7 days following a battery recharge. Within 7 days, each connected cell's specific gravity must be measured to confirm the state of charge. Following a minor battery recharge (such as equalizing charge that does not follow a deep discharge) specific gravity gradients are not significant, and confirming measurements may be made in less than 7 days.

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.
3. IEEE-450-1980.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.7 AC Instrument Bus Sources – Operating

BASES

BACKGROUND

The 120 V AC instrument supply is split into 8 buses. Instrument buses 2 and 3 are fed through an inverter from the "A" battery distribution system and the "B" battery distribution system, respectively. Instrument buses 1 and 4 are normally fed from 480 volt MCC-5 and MCC-6 respectively via their constant voltage transformers (CVT). An alternate power supply for instrument buses 1, 2, 3 and 4 is a common motor control center. Instrument buses 6, 7 (panels 7A and 7B), 8, and 9 (panels 9A and 9B) are powered from instrument buses 1, 2, 3, and 4 respectively, via breakers.

The 120 V AC instrument buses supply power to instrumentation and controls used to monitor and actuate the Reactor Protection System (RPS) and Engineered Safety Features (ESF) and other components. The inverters are the preferred source of power for Instrument buses 2, 3, 7 and 8 while the CVTs are the preferred source of power for Instrument buses 1, 4, 6 and 9.

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume Engineered Safety Feature systems are OPERABLE. The AC Instrument Bus Sources are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to portions of the RPS and ESFAS instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

The OPERABILITY of the AC Instrument Bus Sources is consistent with the initial assumptions of the accident analyses and is based on meeting the design basis of the

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

unit. This includes maintaining required AC instrument buses OPERABLE during accident conditions in the event of:

a. An assumed loss of all offsite AC electrical power or all onsite AC electrical power; or

b. An assumed loss of offsite power and a worst case single active failure.

AC Instrument Bus Sources are a part of the distribution system and, as such, satisfy Criterion 3 of the NRC Policy Statement.

LCO

The AC Instrument Bus Sources ensure the availability of AC electrical power for the systems instrumentation required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence (AOO) or a postulated DBA.

Maintaining the required AC Instrument Bus Sources OPERABLE ensures that the redundancy incorporated into the design of the RPS and ESFAS instrumentation and controls is maintained. The two inverters (one per train) ensure an uninterruptible supply of AC electrical power to four of the eight AC instrument buses even if the 480 V safety buses are de-energized.

Operable Instrument Bus Sources require the associated instrument bus to be powered by the inverter with output voltage and frequency within tolerances, and power input to the Instrument Bus Sources from the preferred source.

APPLICABILITY

The Instrument Bus Sources are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

(continued)

BASES

APPLICABILITY (continued)

b. Adequate core cooling is provided, and containment OPERABILITY and other instrument functions are maintained in the event of a postulated DBA.

Instrument Bus Sources requirements for MODES 5 and 6 are covered in the Bases for LCO 3.8.8, "AC Instrument Bus Sources - Shutdown and During Movement of Irradiated Fuel Assemblies."

ACTIONS

A.1

With a required AC Instrument Bus Sources inoperable, its associated AC instrument bus becomes inoperable until it is manually re-energized from its alternate AC source.

For this reason a Note has been included in Condition A requiring the entry into the Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating." This ensures that the instrument bus is re-energized within 2 hours.

Required Action A.1 allows 24 hours to fix the inoperable AC Instrument Bus Source and return it to service. The 24 hour limit is based upon engineering judgment, taking into consideration the time required to repair an AC Instrument Bus Source and the additional risk to which the unit is exposed because of the AC Instrument Bus Source inoperability. This has to be balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems such a shutdown might entail. When the AC instrument bus is powered from its alternate AC source, it is relying upon interruptible AC electrical power sources (offsite). The AC Instrument Bus Source to the AC instrument buses is the preferred source for powering instrumentation trip setpoint devices.

B.1 and B.2

If the inoperable devices or components cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within

(continued)

BASES

ACTIONS

B.1 and B.2 (continued)

36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and associated AC instrument buses energized from the Inverter. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation of the RPS and ESFAS connected to the AC instrument buses. The 7 day Frequency takes into account the redundant capability of the Instrument Bus Sources and other indications available in the control room that alert the operator to inverter malfunctions.

SR 3.8.7.2

This surveillance verifies that the required circuit breakers are closed and the associated instrument buses energized from the CVTs. Actual measurement of voltage is not required. Confirmation that the buses are energized by observing status lights, instrument displays, etc., is sufficient to confirm the instrument buses are energized. The 7 day frequency takes into account the redundant capability of the AC instrument bus sources and administrative requirements governing alignment of electrical equipment.

REFERENCES

1. UFSAR, Chapter 6.

3. UFSAR, Chapter 15.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.8 AC Instrument Bus Sources – Shutdown

BASES

BACKGROUND

A description of the AC Instrument Bus Sources is provided in the Bases for LCO 3.8.7, "AC Instrument Bus Sources – Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume Engineered Safety Feature systems are OPERABLE. The AC Instrument Bus Sources are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to the Reactor Protective System and Engineered Safety Features Actuation System instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the AC Instrument Bus Sources is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum AC Instrument Bus Sources to each AC instrument bus during MODES 5 and 6 ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate power is available to mitigate events postulated during shutdown, such as a fuel handling accident.

The AC Instrument Bus Sources were previously identified as part of the distribution system and, as such, satisfy Criterion 3 of the NRC Policy Statement.

(continued)

BASES (continued)

LCO

The AC Instrument Bus Sources ensure the availability of electrical power for the instrumentation for systems required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated DBA. The battery powered inverters provide an uninterruptible supply of electrical power to four of the eight associated AC instrument buses even if the 480 V safety buses are de-energized. OPERABILITY of the AC Instrument Bus Sources requires that the AC instrument bus be powered by the preferred AC Source. This ensures the availability of sufficient AC Instrument Bus Sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

APPLICABILITY

The AC Instrument Bus Sources required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel in the core;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

AC Instrument Bus Sources requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.7.

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3 or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving fuel assemblies while in MODE 1, 2, 3 or 4, the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of irradiated fuel

(continued)

BASES

ACTIONS (continued)

assemblies would not be sufficient reason to require a reactor shutdown.

A.1, A.2.1, A.2.2, A.2.3, and A.2.4

Although two trains may be required by LCO 3.8.10, "Distribution Systems – Shutdown," the remaining OPERABLE AC Instrument Bus Sources may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS, fuel movement, and operations with a potential for positive reactivity additions. By the allowance of the option to declare required features inoperable with the associated AC Instrument Bus Source inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCOs' Required Actions. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions). The Required Action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory, provided the required SDM is maintained.

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC Instrument Bus Sources and to continue this action until restoration is accomplished in order to provide the necessary AC Instrument Bus Source of power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required AC Instrument Bus Sources should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power or powered from a non-preferred source.

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1 (continued)

closed and associated AC instrument buses energized from the inverter. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation connected to the associated AC instrument buses. The 7 day Frequency takes into account the redundant capability of the AC Instrument Bus Sources and other indications available in the control room that alert the operator to inverter malfunctions.

SR 3.8.8.2

This surveillance verifies that the required circuit breakers are closed and the associated instrument buses energized from the CVTs. Actual measurement of voltage is not required. Confirmation that the buses are energized by observing status lights, instrument displays, etc., is sufficient to confirm the instrument buses are energized. The 7 day frequency takes into account the redundant capability of the AC instrument bus sources and administrative requirements governing alignment of electrical equipment.

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.9 Distribution Systems – Operating

BASES

BACKGROUND

The onsite AC, DC, and AC instrument bus electrical power distribution systems are divided by train into two redundant AC, DC, and AC instrument bus electrical power distribution subsystems.

The AC electrical power subsystem for each train consists of a primary Engineered Safety Feature (ESF) 480 V bus and secondary buses, distribution panels and motor control centers. Each 480 V ESF bus shares the common offsite source of power and is provided with a dedicated onsite diesel generator (DG) source. The 480 V ESF bus E2 is normally powered from the 115 kV switchyard through the startup transformer, 4.160 kV bus 3 and station service transformer 2G. The 480 V ESF bus E1 is normally powered from the main generator through the unit main (auxiliary) transformer, 4.160 kV buses 1 and 2 and station service transformer 2F. A main generator lockout causes 4.160 kV buses 1 and 2 to be automatically transferred to the startup transformer which results in 480 V ESF bus E1 being supplied from the startup transformer. Should a failure of the startup transformer occur, a spare startup transformer located onsite can be jumpered into service. During the time that the startup transformer is out of service, the unit auxiliary transformer can supply power to the onsite distribution system by back-feeding the main transformer from the 230 kV switchyard. Prior to back-feeding the main transformer from the 230 kV switchyard, the generator must be disconnected from the main transformer by removing the connecting straps. The main transformer backfeeding will only be done during cold shutdown unless nuclear safety consideration require it to be done during hot shutdown when no other offsite power sources are available. If the offsite source is unavailable, the onsite emergency DG supplies power to the 480 V ESF bus. Control power for the 4.160 kV and 480 V breakers is supplied from the batteries. Additional description of this system may be found in the Bases for LCO 3.8.1, "AC Sources – Operating," and the Bases for LCO 3.8.4, "DC Sources – Operating."

(continued)

BASES

BACKGROUND (continued)

The secondary AC electrical power distribution system for each train includes the safety related motor control centers, and distribution panels shown in Table B 3.8.9-1. The Auxiliary Feedwater (AFW) Header Discharge Valve to S/G "A", V2-16A and the Service Water System (SWS) Turbine Building Supply Valve (emergency supply), V6-16C are powered from both Train A and Train B of the AC electrical bus distribution system by utilization of Automatic Bus Transfer (ABT) devices and molded case circuit breakers connected to each AC distribution train. Magnetic trip elements for these circuit breakers (two breakers per valve) provide circuit protection to prevent common mode failure of both trains of the AC distribution systems.

The 120 VAC instrument buses are arranged in two load groups per train. One load group is made up of two instrument buses normally powered from an inverter. The remaining load group is made up of two instrument buses powered from a constant voltage transformer powered from the associated AC emergency bus. The alternate power supply for the inverter supplied instrument buses and the constant voltage transformer supplied instrument buses is an AC source powered from the station AC power distribution system, and its use is governed by LCO 3.8.7, "AC Instrument Bus Sources - Operating."

There are two redundant 125 VDC electrical power distribution subsystems (one for each train).

The list of all required distribution buses is presented in Table B 3.8.9-1.

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 6 (Ref. 1), and in the FSAR, Chapter 15 (Ref. 2), assume ESF systems are OPERABLE. The AC, DC, and AC instrument bus electrical power distribution systems are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power

(continued)

BASES

APPLICABLE SAFETY ANALYSIS (continued)

Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

The OPERABILITY of the AC, DC, and AC instrument bus electrical power distribution systems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining power distribution systems OPERABLE during accident conditions in the event of:

a. An assumed loss of all offsite power or all onsite AC electrical power; or

b. An assumed loss of offsite power and worst case single active failure.

The magnetic and thermal trip elements of the molded case circuit breakers for the Auxiliary Feedwater (AFW) Header Discharge Valve to S/G "A", V2-16A and the Service Water System (SWS) Turbine Building Supply Valve (emergency supply), V16-16C are required to function to prevent transferring a fault from one train of the AC distribution System to the other train of the AC distribution System (Ref. 3). For this to occur, a trip element for both of the breakers associated with one valve (one connected to each train of the AC Distribution System) would have to fail.

The distribution systems satisfy Criterion 3 of the NRC Policy Statement.

LCO

The required power distribution subsystems listed in Table B 3.8.9-1 ensure the availability of AC, DC, and AC instrument bus electrical power for the systems required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence (AOO) or a postulated DBA. The AC, DC, and AC instrument bus electrical power distribution subsystems are required to be OPERABLE.

Maintaining the Train A and Train B AC, DC, and AC instrument bus electrical power distribution subsystems OPERABLE ensures that the redundancy incorporated into the design of ESF is not defeated. Therefore, a single failure within any system or within the electrical power

(continued)

BASES

LCO (continued)

distribution subsystems will not prevent safe shutdown of the reactor. OPERABLE AC electrical power distribution subsystems require the associated buses, motor control centers, distribution panels and auxiliary fuse panels to be energized to their proper voltages. OPERABLE DC electrical power distribution subsystems require the associated buses to be energized to their proper voltage from either the associated battery or charger. OPERABLE instrument bus electrical power distribution subsystems require the associated buses to be energized to their proper voltage from the associated inverter via inverted DC voltage, the constant voltage transformer or the alternate feed.

Based on the number of safety significant electrical loads associated with each bus listed in Table B 3.8.9-1, if one or more of the buses becomes inoperable, entry into the appropriate Conditions and Required Actions of LCO 3.8.9 is required. Other buses, such as motor control centers (MCC) and distribution panels, which help comprise the AC and DC distribution systems are not listed in Table B 3.8.9-1. The loss of electrical loads associated with these buses may not result in a complete loss of a redundant safety function necessary to shut down the reactor and maintain it in a safe condition. Therefore, should one or more of these buses become inoperable due to a failure not affecting the OPERABILITY of a bus listed in Table B 3.8.9-1 (e.g., a breaker supplying a single MCC fails open), the individual loads on the bus would be considered inoperable, and the appropriate Conditions and Required Actions of the LCOs governing the individual loads would be entered. However, if one or more of these buses is inoperable due to a failure also affecting the OPERABILITY of a bus listed in Table B 3.8.9-1 (e.g., loss of a 480 V emergency bus, which results in de-energization of all buses powered from the 480 V emergency bus), then although the individual loads are still considered inoperable, the Conditions and Required Actions of the LCO for the individual loads are not required to be entered, since LCO 3.0.6 allows this exception (i.e., the loads are inoperable due to the inoperability of a support system governed by a Technical Specification; the 480 V emergency bus).

The magnetic and thermal trip elements of at least one of the molded case circuit breakers for both the Auxiliary

(continued)

BASES

LCO (continued)

Feedwater (AFW) Header Discharge Valve to S/G "A", V2-16A and the Service Water System (SWS) Turbine Building Supply Valve (emergency supply), V16-16C are required to be OPERABLE to provide isolation between the separate AC distribution subsystems.

In addition, tie breakers between redundant safety related AC, DC, and AC instrument bus power distribution subsystems, if they exist, must be open. This prevents any electrical malfunction in any power distribution subsystem from propagating to the redundant subsystem, that could cause the failure of a redundant subsystem and a loss of essential safety function(s). If any tie breakers are closed, the affected redundant electrical power distribution subsystems are considered inoperable. This applies to the onsite, safety related redundant electrical power distribution subsystems. It does not, however, preclude redundant 480 V Emergency buses from being powered from the same offsite circuit.

APPLICABILITY

The electrical power distribution subsystems are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

b. Adequate core cooling is provided, and containment OPERABILITY and other instrument functions are maintained in the event of a postulated DBA.

Electrical power distribution subsystem requirements for MODES 5 and 6 are covered in the Bases for LCO 3.8.10, "Distribution Systems – Shutdown and During Movement of Irradiated Fuel Assemblies."

ACTIONS

A.1

With one or more required AC buses, motor control centers, or distribution panels, except AC instrument buses, in one train inoperable, the remaining AC electrical power distribution subsystem in the other train is capable of

(continued)

ACTIONS

A.1 (continued)

supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single active failure. The overall reliability is reduced, however, because a single active failure in the remaining power distribution subsystems could result in the minimum required ESF functions not being supported. Therefore, the required AC buses, load centers, motor control centers, and distribution panels must be restored to OPERABLE status within 8 hours.

The Condition A worst scenario is one train without AC power (i.e., no offsite power to the train and the associated DG inoperable). In this Condition, the unit is more vulnerable to a complete loss of AC power. It is, therefore, imperative that the unit operator's attention be focused on minimizing the potential for loss of power to the remaining train by stabilizing the unit, and on restoring power to the affected train. The 8 hour time limit before requiring a unit shutdown in this Condition is acceptable because of:

a. The potential for decreased safety if the unit operator's attention is diverted from the evaluations and actions necessary to restore power to the affected train, to the actions associated with taking the unit to shutdown within this time limit; and

b. The potential for an event in conjunction with a single failure of a redundant component in the train with AC power.

The second Completion Time for Required Action A.1 establishes a limit on the maximum time allowed for any combination of required distribution subsystems to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition A is entered while, for instance, a DC bus is inoperable and subsequently restored OPERABLE, the LCO may already have been not met for up to 2 hours. This could lead to a total of 10 hours, since initial failure of the LCO, to restore the AC distribution system. At this time, a DC circuit could again become inoperable, and AC distribution restored OPERABLE. This could continue indefinitely.

(continued)

BASES

ACTIONS

A.1 (continued)

The Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This will result in establishing the "time zero" at the time the LCO was initially not met, instead of the time Condition A was entered. The 16 hour Completion Time is an acceptable limitation on this potential to fail to meet the LCO indefinitely.

B.1

With one AC instrument bus subsystem inoperable, the remaining OPERABLE AC instrument buses are capable of supporting the minimum safety functions necessary to shut down the unit and maintain it in the safe shutdown condition. Overall reliability is reduced, however, since an additional single failure could result in the minimum required ESF functions not being supported. Therefore, the required AC instrument bus must be restored to OPERABLE status within 2 hours by powering the bus from the associated alternate AC supply.

Condition B represents one AC instrument bus without power; potentially both the DC source or the constant voltage transformer and the associated alternate AC source are nonfunctioning. In this situation, the unit is significantly more vulnerable to a complete loss of all noninterruptible power. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for loss of power to the remaining instrument buses and restoring power to the affected instrument bus.

This 2 hour limit is more conservative than Completion Times allowed for the vast majority of components that are without adequate instrument AC power. Taking exception to LCO 3.0.2 for components without adequate instrument AC power, that would have the Required Action Completion Times shorter than 2 hours if declared inoperable, is acceptable because of:

a. The potential for decreased safety by requiring a change in unit conditions (i.e., requiring a shutdown) and not allowing stable operations to continue;

(continued)

BASES

ACTIONS

B.1 (continued)

b. The potential for decreased safety by requiring entry into numerous Applicable Conditions and Required Actions for components without adequate instrument AC power and not providing sufficient time for the operators to perform the necessary evaluations and actions for restoring power to the affected train; and

c. The potential for an event in conjunction with a single failure of a redundant component.

The 2 hour Completion Time takes into account the importance to safety of restoring the AC instrument bus to OPERABLE status, the redundant capability afforded by the other OPERABLE instrument buses, and the low probability of a DBA occurring during this period.

The second Completion Time for Required Action B.1 establishes a limit on the maximum allowed for any combination of required distribution subsystems to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an AC bus is inoperable and subsequently returned OPERABLE, the LCO may already have been not met for up to 8 hours. This could lead to a total of 10 hours, since initial failure of the LCO, to restore the instrument bus distribution system. At this time, an AC train could again become inoperable, and instrument bus distribution restored OPERABLE. This could continue indefinitely.

This Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This will result in establishing the "time zero" at the time the LCO was initially not met, instead of the time Condition B was entered. The 16 hour Completion Time is an acceptable limitation on this potential to fail to meet the LCO indefinitely.

C.1

With DC bus(es) in one train inoperable, the remaining DC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall

(continued)

ACTIONS

C.1 (continued)

reliability is reduced, however, because a single failure in the remaining DC electrical power distribution subsystem could result in the minimum required ESF functions not being supported. Therefore, the required DC buses must be restored to OPERABLE status within 2 hours by powering the bus from the associated battery or charger.

Condition C represents one train without adequate DC power; potentially both with the battery significantly degraded and the associated charger nonfunctioning. In this situation, the unit is significantly more vulnerable to a complete loss of all DC power. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for loss of power to the remaining trains and restoring power to the affected train.

This 2 hour limit is more conservative than Completion Times allowed for the vast majority of components that would be without power. Taking exception to LCO 3.0.2 for components without adequate DC power, which would have Required Action Completion Times shorter than 2 hours, is acceptable because of:

a. The potential for decreased safety by requiring a change in unit conditions (i.e., requiring a shutdown) while allowing stable operations to continue;

b. The potential for decreased safety by requiring entry into numerous applicable Conditions and Required Actions for components without DC power and not providing sufficient time for the operators to perform the necessary evaluations and actions for restoring power to the affected train; and

c. The potential for an event in conjunction with a single failure of a redundant component.

The 2 hour Completion Time for DC buses is consistent with Regulatory Guide 1.93 (Ref. 4). The second Completion Time for Required Action C.1 establishes a limit on the maximum time allowed for any combination of required distribution subsystems to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition C is entered while, for instance, an AC bus is inoperable and subsequently returned OPERABLE, the LCO may already have

(continued)

BASES

ACTIONS

C.1 (continued)

been not met for up to 8 hours. This could lead to a total of 10 hours, since initial failure of the LCO, to restore the DC distribution system. At this time, an AC train could again become inoperable, and DC distribution restored OPERABLE. This could continue indefinitely.

This Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This will result in establishing the "time zero" at the time the LCO was initially not met, instead of the time Condition C was entered. The 16 hour Completion Time is an acceptable limitation on this potential to fail to meet the LCO indefinitely.

D.1 and E.1

With trip elements of both molded case circuit breakers associated with either the Aux. Feedwater Header Discharge Valve to S/G "A", V2-16A or the Service Water Turbine Building Supply Valve (emergency supply), V16-16C inoperable, the potential exist that a single failure could adversely affect both trains of the AC Distribution System. For this to occur, a trip element for both of the breakers associated with one valve (one connected to each train of the AC Distribution System) would have to fail. Therefore, one of the associated molded case circuit breaker(s) for each affected valve must be placed in the open position.

Engineering judgement and operating experience indicates that two hours is adequate time to open the affected circuit breaker(s). The two hour Completion Time take into account the importance to safety of opening the affected circuit breakers, the low probability of inoperability of a trip element for both circuit breakers concurrent with a fault on the associated circuit and the low probability of a DBA occurring during this period.

With the affected circuit breaker(s) open, normal or alternate AC power is not available to the associated valve. This Note ensures appropriate remedial actions are taken, if necessary, if the affected systems are rendered inoperable by the removal of the power source(s) from the associated valve.

(continued)

BASES

ACTIONS (continued)

F.1 and F.2

If the inoperable distribution subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

G.1

With two trains with inoperable distribution subsystems that result in a loss of safety function, adequate core cooling, containment OPERABILITY and other instrument functions for DBA mitigation would be compromised, and immediate plant shutdown in accordance with LCO 3.0.3 is required.

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

This Surveillance verifies that the required AC, DC, and AC instrument bus electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence of the electrical divisions is maintained, and the appropriate voltage is available to each required bus. The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC instrument bus electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.

This SR is modified by a Note which states that Voltage measurement is not required for the AC Instrument buses supplied from Constant Voltage Transformers (CVTs), for these buses confirmation that the buses are energized by observing status lights, instrument displays, etc., is sufficient to confirm the buses are energized.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.9.2 and SR 3.8.9.3

The two breakers associated with each ABT will trip on over current as required to prevent fault from affecting both trains of the AC Distribution System. The 18 month Frequency of the Surveillance is based on engineering judgement, taking into considerationthe unit conditions desirable for performing the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency.

Therefore the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.
3. SER for HBRSEP Unit No. 2 Amendment 123, dated Sept. 5, 1989
4. Regulatory Guide 1.93, December 1974.

Table B 3.8.9-1 (page 1 of 1)
AC and DC Electrical Power Distribution Systems

TYPE	VOLTAGE	TRAIN A*	TRAIN B*
AC buses	4160 V 480 V	4.16 kV Bus 2 480 V Bus E1	4.16 kV Bus 3 480 V Bus E2
DC buses	125 V	MCC A Distribution Panel A	MCC B Distribution Panel B
AC instrument buses (IB)	120V	IB 1 IB 2 IB 6 IB 7 (A & B)	IB 3 IB 4 IB 8 IB 9 (A & B)

* Each train of the AC and DC electrical power distribution systems is a subsystem.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.10 Distribution Systems — Shutdown

BASES

BACKGROUND

A description of the AC, DC, and AC instrument bus electrical power distribution systems is provided in the Bases for LCO 3.8.9, "Distribution Systems — Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident and transient analyses in the UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume Engineered Safety Feature (ESF) systems are OPERABLE. The AC, DC, and AC instrument bus electrical power distribution systems are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the AC, DC, and AC instrument bus electrical power distribution system is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum AC, DC, and AC instrument bus electrical power distribution subsystems during MODES 5 and 6, and during movement of irradiated fuel assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

The AC and DC electrical power distribution systems satisfy Criterion 3 of the NRC Policy Statement.

(continued)

BASES (continued)

LCO

Various combinations of subsystems, equipment, and components are required OPERABLE by other LCOs, depending on the specific plant condition. Implicit in those requirements is the required OPERABILITY of necessary support required features. This LCO explicitly requires energization of the portions of the electrical distribution system necessary to support OPERABILITY of required systems, equipment, and components - all specifically addressed in each LCO and implicitly required via the definition of OPERABILITY.

Maintaining these portions of the distribution system energized ensures the availability of sufficient power to operate the unit in a safe manner to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

APPLICABILITY

The AC and DC electrical power distribution subsystems required to be OPERABLE in MODES 5 and 6, and during movement of irradiated fuel assemblies, provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel in the core;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition and refueling condition.

The AC, DC, and AC instrument bus electrical power distribution subsystems requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.9.

ACTIONS

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating

(continued)

ACTIONS (continued)

that LCO 3.0.3 is not applicable. If moving fuel assemblies while in MODE 1, 2, 3, or 4 the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of irradiated fuel assemblies would not be sufficient reason to require a reactor shutdown.

A.1, A.2.1, A.2.2, A.2.3, A.2.4, and A.2.5

Although redundant required features may require redundant trains of electrical power distribution subsystems to be OPERABLE, one OPERABLE distribution subsystem train may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and fuel movement. By allowing the option to declare required features associated with an inoperable distribution subsystem inoperable, appropriate restrictions are implemented in accordance with the affected distribution subsystem LCO's Required Actions. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions).

Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC and DC electrical power distribution subsystems and to continue this action until restoration is accomplished in order to provide the necessary power to the unit safety systems.

Notwithstanding performance of the above conservative Required Actions, a required residual heat removal (RHR) subsystem may be inoperable. In this case, Required Actions A.2.1 through A.2.4 do not adequately address the concerns relating to coolant circulation and heat removal. Pursuant to LCO 3.0.6, the RHR ACTIONS would not be entered. Therefore, Required Action A.2.5 is provided to direct declaring RHR inoperable, which results in taking the appropriate RHR actions.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required distribution subsystems should

(continued)

BASES

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, A.2.4, and A.2.5 (continued)

be completed as quickly as possible in order to minimize the time the unit safety systems may be without power.

SURVEILLANCE REQUIREMENTS

SR 3.8.10.1

This Surveillance verifies that the AC, DC, and AC instrument bus electrical power distribution subsystems are functioning properly, with all the buses energized. The 7 day Frequency takes into account the capability of the electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.

This SR is modified by Note which states that voltage measurement is not required for the AC Instrument buses supplied from Constant Voltage Transformers (CVTs). For these buses confirmation that the buses are energized by observing status lights, instrument displays, etc., is sufficient to confirm the buses are energized.

REFERENCES

1. UFSAR, Chapter 6.

2. UFSAR, Chapter 15.

SUPPLEMENT 4
CONVERSION PACKAGE SECTION 4.0
PAGE INSERTION INSTRUCTIONS

Remove and insert the following pages into Enclosure 18 to Serial: RNP-RA/96-0141.

	Remove Page	Insert Page
a.	Part 1, "Markup of Current Technical Specifications (CTS)"	
	5.4-2	5.4-2
b.	Part 2, "Discussion of Changes (DOCs) for CTS Markup"	
	1 through 4	1 through 5
c.	Part 3, "No Significant Hazards Consideration (NSHC), And Basis for Categorical Exclusion for 10 CFR 51.22"	
	NA	
d.	Part 4, "Markup of NUREG-4131, Revision 1, Standard Technical Specifications-Westinghouse Plants, (ISTS)"	
	4.0-2	4.0-2
	-	4.0-2a
e.	Part 5, "Justification of Differences (JFDs) to ISTS"	
	1	1
f.	Part 6, "Markup of ISTS Bases"	
	NA	
g.	Part 7, "Justification for Differences (JFDs) to ISTS Bases"	
	NA	
h.	Part 8, "Proposed HBRSEP, Unit No. 2 ITS"	
	4.0-2	4.0-2
i.	Part 9, "Proposed Bases to HBRSEP, Unit No. 2 ITS Bases"	
	NA	
J.	Part 10, "ISTS Generic Changes"	
	NA	

Specification 4.3

ITS

[4.3.1.1] 5.4.2.2 SPENT FUEL STORAGE PIT

which includes an allowance for uncertainties — M3

A1

A combination of nominal assembly spacing, neutron absorber material between the assemblies, and restrictions on fuel design, integral burnable absorber content, reconstitution, and storage, is required to assure that k_{eff} is maintained less than 0.95 when the spent fuel storage pit is flooded with unborated water based on a maximum assembly planar enrichment of 4.95 ± 0.05 (4.95 nominal) weight percent U_{235}.[1] Fuel assemblies with maximum planar enrichments greater than 4.55 + 0.05 (4.55 nominal) weight percent U_{235} have requirements for minimum integral burnable absorber content.[2]

LA3

5.0

A4

[4.3.1.1.b]
[4.3.1.1.a]
[4.3.1.1.e]

5.4.3 BORON CONCENTRATION - SPENT FUEL STORAGE PIT

The spent fuel storage pit is filled with borated water at a concentration of greater than or equal to 1500 ppm during refueling operations or new fuel movement in the spent fuel storage pit. This minimum boron concentration ensures subcriticality under worst case design events.

See 3.7.13

[4.3.3] 5.4.4 STORAGE CAPACITY - SPENT FUEL STORAGE PIT

The spent fuel storage pit provides a storage location for 544 fuel assemblies.

which includes an allowance for uncertainties — A4

Add 4.3.1.1.c, 4.3.1.1.d — M1

Reference

(1) FSAR Section 9.1

(2) EMF-94-113, "H. B. Robinson New and Spent Fuel Criticality Analysis," July 1994, Siemens Power Corporation

A3

ADMINISTRATIVE CHANGES

A1 In the conversion of the H. B. Robinson Steam Electric Plant (HBRSEP), Unit 2 Current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS) certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make ITS consistent with the conventions in the Standard Technical Specifications, Westinghouse Plants, NUREG 1431, Revision 1 (i.e., Improved Standard Technical Specifications (ISTS)).

A2 CTS Section 5.1 is revised by providing a more precise description of the HBRSEP Site Location in the ITS. This change is administrative and therefore has no adverse impact on safety.

A3 CTS References are not retained in ITS Chapter 4.0. The References do not provide any requirements, only information through the UFSAR or other documents. This change does not alter any requirements, and is consistent with NUREG-1431. This change is administrative and has no adverse impact on safety.

A4 CTS Section 5.4.2.1 and Section 5.4.2.2, which specify the maximum fuel assembly axial plane enrichment of 4.95 + 0.05 (nominal 4.95) weight percent U-235, are revised in ITS to a maximum enrichment of 5.0 weight percent which includes and allowance for uncertainties. The restatement of the maximum U-235 enrichment does not alter the enrichment requirement, and is consistent with NUREG-1431. This change is administrative and has no adverse impact on safety.

TECHNICAL CHANGES - MORE RESTRICTIVE

M1 The CTS is revised to adopt ISTS Specifications 4.3.1.1.c and 4.3.1.1.d. This change adds the nominal center to center spacing between fuel assemblies placed in the high and low density spent fuel storage racks, respectively. This change reflects actual rack design and does not impose significant restrictions upon unit operation. These values are consistent with assumptions of the applicable safety analysis. Since no similar Specification exists, this change is more restrictive and has no adverse impact on safety.

M2 The CTS is revised to adopt ISTS Specification 4.3.2, "Drainage." This change provides a design limitation on the spent fuel storage pool water level, which is important to spent fuel shielding capabilities and does not impose significant restrictions on unit operation. Since no similar Specification exists, this change is more restrictive and has no adverse impact on safety.

M3 CTS Section 5.4.2.1 which specifies that K_{eff} is assured to be less than 0.98 in an optimum moderation criticality event, is revised in ITS to require that the K_{eff} be less than 0.98 in an optimum moderation criticality event with an allowance for uncertainties. CTS Section 5.4.2.2, which specifies that the spent fuel storage pit be designed to maintain K_{eff} less than 0.95 when the spent fuel storage pit is flooded with unborated water, is revised in ITS to require that K_{eff} be less than 0.95 with an allowance for uncertainties. Requiring inclusion of uncertainties in the criticality analyses is reasonable to assure the fuel in the pool remains subcritical under postulated events in the fuel storage racks and does not impose significant restrictions upon unit operation. (The allowance for uncertainties is described in UFSAR Section 9.1.) Since ITS 4.3.1.2.b and 4.3.1.2.c specify uncertainties be accounted for in the criticality analysis and uncertainties be included when meeting the requirement of K_{eff}, this change is more restrictive, and has no adverse impact on safety.

TECHNICAL CHANGES - LESS RESTRICTIVE (GENERIC)

LA1 CTS Section 5.1 provides descriptive details related to the plant location, and a statement related to the distance from the reactor to the site exclusion boundary. The detail information being relocated which is associated with the specified LA DOCs provides specific information related to plant design or location. This information is relocated to the UFSAR. Changes to the UFSAR are controlled in accordance with 10 CFR 50.71e and 10 CFR 50.59. Relocating this information to the UFSAR ensures continuing compliance with the relocated information and ensures appropriate controls for changing this information.

The details associated with the involved Section are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains those Design Features which, if altered or modified, would have a significant effect on safety, and are not covered in categories described in 10 CFR 50.36(c)(1), (2), and (3). This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced.

LA2 CTS Section 5.3 provides descriptive details related to the Reactor Core and the Reactor Coolant System (RCS). The detail information being relocated which is associated with the specified LA DOCs provides specific information related to plant design or location. This information is relocated to the UFSAR. Changes to the UFSAR are controlled in accordance with 10 CFR 50.71e and 10 CFR 50.59. Relocating this information to the UFSAR ensures continuing compliance

with the relocated information and ensures appropriate controls for changing this information.

The details associated with the involved Section are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains those Design Features which, if altered or modified, would have a significant effect on safety, and are not covered in categories described in 10 CFR 50.36(c)(1), (2), and (3). This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced.

LA3 CTS Section 5.4 provides descriptive details related to the Spent Fuel Storage Racks. The detail information being relocated which is associated with the specified LA DOCs provides specific information related to plant design or location. This information is relocated to the UFSAR. Changes to the UFSAR are controlled in accordance with 10 CFR 50.71e and 10 CFR 50.59. Relocating this information to the UFSAR ensures continuing compliance with the relocated information and ensures appropriate controls for changing this information without resulting in an adverse impact on safety.

The details associated with the involved Section are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains those Design Features which, if altered or modified, would have a significant effect on safety, and are not covered in categories described in 10 CFR 50.36(c)(1), (2), and (3). This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced.

LA4 CTS Section 5.2 provides descriptive details related to the Reactor Containment, Penetrations, and Containment Systems. The detail information being relocated which is associated with the specified LA DOCs provides specific information related to plant design or location. This information is relocated to the UFSAR. Changes to the UFSAR are controlled in accordance with 10 CFR 50.71e and 10 CFR 50.59. Relocating this information to the UFSAR ensures continuing compliance with the relocated information and ensures appropriate controls for changing this information.

The details associated with the involved Section are not required to be in the ITS to provide adequate protection of the public health and

safety, since the ITS still retains those Design Features which, if altered or modified, would have a significant effect on safety, and are not covered in categories described in 10 CFR 50.36(c)(1), (2), and (3). This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced.

LA5 CTS Section 5.5 provides descriptive details related to seismic design of plant structures and systems. The detail information being relocated which is associated with the specified LA DOCs provides specific information related to plant design or location. This information is relocated to the UFSAR. Changes to the UFSAR are controlled in accordance with 10 CFR 50.71e and 10 CFR 50.59. Relocating this information to the UFSAR ensures continuing compliance with the relocated information and ensures appropriate controls for changing this information.

The details associated with the involved Section are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains those Design Features which, if altered or modified, would have a significant effect on safety, and are not covered in categories described in 10 CFR 50.36(c)(1), (2), and (3). This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced.

LA6 CTS Section 1.19 and Figure 1.1-1 which describe details of the site boundary are not retained in ITS and are relocated to licensee controlled documents. The detail information being relocated which is associated with the specified LA DOCs provides specific information related to plant design or location. This information is relocated to the UFSAR. Changes to the UFSAR are controlled in accordance with 10 CFR 50.71e and 10 CFR 50.59. Relocating this information to the UFSAR ensures continuing compliance with the relocated information and ensures appropriate controls for changing this information. The relocation of the site boundary information and figure does not alter any requirements, and is consistent with NUREG-1431.

The details associated with the involved Section are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains those Design Features which, if altered or modified, would have a significant effect on safety, and are

not covered in categories described in 10 CFR 50.36(c)(1), (2), and (3). This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced.

TECHNICAL CHANGES - LESS RESTRICTIVE (SPECIFIC)

L1 CTS Specification 5.3.1.1 is revised by adopting the ISTS Specification 4.2.1 allowances for limited substitutions of filler rods and limited use of lead test assemblies in the ITS. This is a relaxation of requirements, and is less restrictive. This change is acceptable, however, because it provides specific recognition that reconstitution of a fuel assembly to replace damaged and leaking fuel rods is not considered to be an unreviewed safety question if the repaired fuel assembly constitutes a previously approved design. This change will not result in modifications to fuel assemblies that would have a significant effect on safety because of the necessity to justify such changes using an NRC-approved methodology. This requirement will confirm (a) conformance to existing design limits, and (b) that safety analyses criteria are met before operation during the next fuel cycle. This change provides flexibility for improved fuel performance and is consistent with Supplement 1 to Generic Letter 90-02, and NUREG-1431.

RELOCATED SPECIFICATIONS

None.

CTS

4.0 DESIGN FEATURES

4.3 Fuel Storage (continued)

[M1] c. A nominal [9.15] inch center to center distance between fuel assemblies placed in [the high density fuel storage racks];

[M1] d. A nominal [10.95] inch center to center distance between fuel assemblies placed in [low density fuel storage racks];

[e. New or partially spent fuel assemblies with a discharge burnup in the "acceptable range" of Figure [3.7.17-1] may be allowed unrestricted storage in [either] fuel storage rack(s); and]

[f. New or partially spent fuel assemblies with a discharge burnup in the "unacceptable range" of Figure [3.7.17-1] will be stored in compliance with the NRC approved [specific document containing the analytical methods, title, date, or specific configuration or figure].]

4.3.1.2 The new fuel storage racks are designed and shall be maintained with:

[5.4.2.1] a. Fuel assemblies having a maximum U-235 enrichment of [4.5] weight percent;

[5.4.2.1] b. $k_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in [Section 9.1 of the FSAR];

[5.4.2.1] c. $k_{eff} \leq 0.98$ if moderated by aqueous foam, which includes an allowance for uncertainties as described in [Section 9.1 of the FSAR]; and

[5.4.2.1] d. A nominal [10.95] inch center to center distance between fuel assemblies placed in the storage racks.

[M2] 4.3.2 Drainage

The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation [23 ft].

(continued)

Insert 4.0-2a

e. Fuel assemblies with maximum planar enrichments greater than 4.55 + 0.05 (4.55 nominal) weight percent U_{235} have requirements for minimum integral burnable absorber content.

1 In the conversion of the HBRSEP current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes which involve the insertion of plant specific terms or parameters are used to preserve consistency with the CTS and licensing basis.

2 The spent fuel storage pool is not designed in accordance with GDC 61 and Regulatory Guide 1.13. The plant was designed and licensed to the proposed Appendix A to 10 CFR 50, which was published in the Federal Register on July 11, 1967 (32FR10213). Appendix A to 10 CFR 50, which became effective in 1971, and was subsequently amended, is somewhat different from the proposed 1967 general design criteria. UFSAR Sections 3.1 and 1.8 include an evaluation of HBRSEP with respect to the proposed 1967 general design criteria and Regulatory Guides, respectively. The normal water level in the spent fuel storage pool is maintained at an elevation approximately 22 feet above the top of the fuel assemblies. The spent fuel pool cooling pump suction is taken at an elevation four feet below the normal water level, which is approximately 18 feet above the top of the fuel assemblies.

3. ISTS Specifications 4.3.1.1.c and 4.3.1.1.d bracketed values for center-to-center fuel assembly spacing in the high density fuel storage racks and the low density fuel storage racks are replaced with plant specific values. This change reflects actual rack design and does not impose significant additional restrictions upon unit operation. These values are consistent with assumptions of the applicable safety analysis.

4. The NUREG is modified to incorporate plant specific requirements regarding burnable absorber requirements for fuel assemblies exceeding 4.55 (nominal) weight percent U_{235} when stored in the spent fuel storage racks.

4.0 DESIGN FEATURES

4.3 Fuel Storage (continued)

b. $k_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Section 9.1 of the UFSAR;

c. A nominal 10.5 inch center-to-center distance between fuel assemblies placed in the high density fuel storage racks; and

d. A nominal 21 inch center-to-center distance between fuel assemblies placed in low density fuel storage racks.

e. Fuel assemblies with maximum planar enrichments greater than 4.55 + 0.05 (4.55 nominal) weight percent U_{235} have requirements for minimum integral burnable absorber content.

4.3.1.2 The new fuel storage racks are designed and shall be maintained with:

a. Fuel assemblies having a maximum U-235 enrichment of 5.0 weight percent;

b. $k_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Section 9.1 of the UFSAR;

c. $k_{eff} \leq 0.98$ in an optimum moderation event, which includes an allowance for uncertainties as described in Section 9.1 of the UFSAR; and

d. A nominal 21 inch center-to-center distance between fuel assemblies placed in the storage racks.

4.3.2 Drainage

The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below 18 feet above the fuel.

4.3.3 Capacity

The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 544 assemblies.

SUPPLEMENT 4
CONVERSION PACKAGE SECTION 5.0
PAGE INSERTION INSTRUCTIONS

Remove and insert the following pages into Enclosure 19 to Serial: RNP-RA/96-0141.

	Remove Page	Insert Page
a.	Part 1, "Markup of Current Technical Specifications (CTS)"	
	6.1-1, 6.2-1, 6.2-2, 6.2-4, 6.5-1, 1-6	6.1-1, 6.2-1, 6.2-2, 6.2-4, 6.5-1, 1-6
	Final Operating License Pages 4, 5, 4, 4	-
	(ITS 5.5)	-
	4.2-4, 4.20-3, 6.9-2, 6.9-9, 4.2-4, 6.13-1	4.2-4, 4.20-3, 6.9-2, 6.9-9, 4.2-4, 6.13-1
b.	Part 2, "Discussion of Changes (DOCs) for CTS Markup"	
	1 through 9	1 through 9
	-	9a, 9b
	10 through 20	10 through 21
c.	Part 3, "No Significant Hazards Consideration (NSHC), And Basis for Categorical Exclusion form 10 CFR 51.22"	
	NA	
d.	Part 4, "Markup of NUREG-4131, Revision 1, Standard Technical Specifications-Westinghouse plants, (ISTS)"	
	5.0-1, 5.0-2, 5.0-3, 5.0-4, 5.0-8	5.0-1, 5.0-2, 5.0-3, 5.0-4, 5.0-8
	5.0-10, 5.0-12	5.0-10, 5.0-12
	-	5.0-12a and 5.0-12b
	5.0-13, 5.0-14, 5.0-15, 5.0-16, 5.0-20	5.0-13, 5.0-14, 5.0-15, 5.0-16, 5.0-20
	5.0-22, 5.0-23	5.0-22, 5.0-23
	Insert 5.6.7-1 (no page number)	5.0-23
	-	5.0-23b
	-	5.0-24a
e.	Part 5, "Justification of differences (JFDs) to ISTS"	
	1 through 3	1 through 6
f.	Part 6, "Markup of ISTS Bases"	
	NA	
g.	Part 7, "Justification for Differences (JFDs) to ISTS Bases"	
	NA	
h.	Part 8, "Proposed HBRSEP, Unit No. 2 ITS"	
	5.0-1, 5.0-4, 5.0-17, 5.0-18, 5.0-19, 5.0-20	5.0-1, 5.0-4, 5.0-17, 5.0-18, 5.0-19, 5.0-20

SUPPLEMENT 4
CONVERSION PACKAGE SECTION 5.0
PAGE INSERTION INSTRUCTIONS

Remove and insert the following pages into Enclosure 19 to Serial: RNP-RA/96-0141.

	Remove Page	Insert Page
h.	Part 8, "Proposed HBRSEP, Unit No. 2 ITS"	
	5.0-21, 5.0-22, 5.0-23, 5.0-32, 5.0-33	5.0-21, 5.0-22, 5.0-32, 5.0-33
i.	Part 9, "Proposed Bases to HBRSEP, Unit No. 2 ITS Bases" NA	
j.	Part 10, "ISTS Generic Changes" NA	

ITS

A1

[5.0] 6.0 ADMINISTRATIVE CONTROLS

[5.1] 6.1 RESPONSIBILITY

[5.1.1] 6.1.1 The General Manager - Robinson Plant shall be responsible for overall facility operation and shall delegate in writing the succession to this responsibility during his absence.

plant

LA21

Add 5.1.2

M 14

Specification 5.2

ITS

A1

[5.2] 6.2 ORGANIZATION

[5.2.1] 6.2.1 An onsite and an offsite organization shall be established for unit operation and corporate management. The onsite and offsite organization shall include the positions for activities affecting the safety of the nuclear power plant.

[5.2.1.a] a) Lines of authority, responsibility and communication shall be established and defined from the highest management levels through intermediate levels to and including all operating organization positions. Those relationships shall be documented and updated, as appropriate, in the form of organizational charts. These organizational charts will be documented in the FSAR and updated in accordance with 10CFR50.71(e). — A3

[5.2.1.c] b) The Senior Vice President - Nuclear Generation shall have corporate responsibility for overall plant nuclear safety. This individual shall take any measures needed to ensure acceptable performance of the staff in operating, maintaining, and providing technical support in the plant so that continued nuclear safety is assured. — a specified corporate officer — LA21

[5.2.1.b] c) The General Manager - Robinson Plant shall be responsible for overall unit safe operation and shall have control over those onsite resources necessary for safe operation and maintenance of the plant. — plant

[5.2.1.d] d) Although the individuals who train the operating staff and those who carry out the quality assurance functions may report to the appropriate manager onsite, they shall have sufficient organizational freedom to be independent from operating pressures. — radiation control, or perform — A4

e) Although health physics individuals may report to any appropriate manager onsite, for matters relating to radiological health and safety of employees and the public, the manager responsible for health physics shall have direct access to that onsite individual. — LA2

radiation control — A37

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(A1)

ITS

having responsibility for overall unit management. Health physics personnel shall have the authority to cease any work activity when worker safety is jeopardized or in the event of unnecessary personnel radiation exposures.

(LA2)

6.2.2 Definitions

Personnel reporting to the General Manager - Robinson Plant shall be identified in Section 6 of the Technical Specifications as the plant staff.

Facility Staff (Unit)

[5.2.2] 6.2.3 The Robinson Nuclear Project (unit staff) organization shall be subject to (include) the following:

[5.2.2.a] a) The shift complement during hot operations (MODES 1, 2, 3 and 4) shall consist of at least one Shift Foreman holding a Senior Reactor Operator's License, one Senior Control Operator holding a Senior Reactor Operator's License, two Control Operators each holding a Reactor Operator's License, two additional shift members, and one Shift Technical Advisor. If an individual that holds a Senior Reactor Operator's License also meets the Shift Technical Advisor requirements, that individual may act in both capacities. (A30) (A5)

[5.2.2.g]

[5.2.2.e] b) Administrative procedures shall be developed and implemented to limit the working hours of unit staff who perform safety-related functions (e.g., Licensed Senior Operators, Licensed Operators, health physicists (radiation control personnel), auxiliary operators, and key maintenance personnel). (A37)

the Shift Technical Advisor (STA) shall provide advisory technical support to the shift superintendent with regard to the safe operation of the unit. (A30) (LA21)

(A1)

ITS

[5.2.2.b] d) At least one licensed operator shall be in the control room when fuel is in the reactor.

(M1)

[5.2.2.b] e) At least two licensed operators (at least one is an SRO) shall be present in the control room during reactor start-up, scheduled reactor shutdown, and during recovery from reactor trips. when in MODES 1, 2, 3 and 4

[5.2.2.d] f) An individual qualified in as a radiation protection procedures control technician shall be on site when fuel is in the reactor. (LA21)

g) ALL CORE ALTERATIONS after the initial fuel loading shall be directly supervised by either a licensed Senior Reactor Operator or Senior Reactor Operator limited to fuel handling who has no other concurrent responsibilities during this operation. (A5)

(L2)

[5.2.2.c] h) The shift complement may be one less than the minimum requirement of Section 6.2.3.a and 6.2.3.b 10 CFR 50.54(m)(2)(i) and Specifications 5.2.2.a and 5.2.2.g for a period of time not to exceed 2 hours in order to accommodate unexpected absence of on-duty shift members provided immediate action is taken to restore the shift complement to within the minimum requirements of Section 6.2.3.a and 6.2.3.b. This provision does not permit any shift member position to be unmanned upon shift change due to an oncoming shift member being late or absent. (LA3)

The position may be vacant for not more than 2 hours, in order to provide for unexpected absence, provides immediate action is taken to fill the required position. (L1)

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6.5 REVIEW AND AUDIT (A1)

6.5.1 The license organization's review and approval process shall assure that the nuclear safety of the facility is maintained.

6.5.1.1 Procedures, Tests, and Experiments (A35)

[5.4.1] 6.5.1.1.1 Written procedures shall be established, implemented, and maintained covering the activities referenced below:

[5.4.1.a]

a. The applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, Rev. 2, February 1978.

b. Refueling operations.

c. Surveillance and test activities of safety-related equipment. (A8)

d. Security Plan implementing procedures.

e. Emergency Plan implementing procedures. (A10)

[5.4.1.d] f. Fire Protection Program implementing procedures.

g. Radiological Environmental Monitoring Program implementing procedures.

h. Offsite Dose Calculation Manual implementing procedures. (A11)

i. Process Control Program implementation procedure. (LA17)

[5.4.1.c] j. Quality Assurance Program for effluent and environmental monitoring (using the guidance in Regulatory Guide 4.15, December 1977). (LA4)

Add 5.4.1.b (M2)

Add 5.4.1.e (M3)

Specification 5.5

A1

I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in NRC Regulatory Guide 1.109, Revision 1, October 1977.

See 1.1

1.15 PROCESS CONTROL PROGRAM (PCP)

The Process Control Program (PCP) shall contain the current formulas, sampling, analyses, tests and determinations to be made to ensure that the processing and packaging of solid radioactive wastes based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure compliance with 10 CFR Part 20, 10 CFR Part 71, and Federal and State regulations and other requirements governing the disposal of the radioactive waste.

LA17

1.16 SOLIDIFICATION

Solidification shall be the conversion of wet radioactive wastes into a form that meets shipping and burial ground requirements.

1.17 PURGE - PURGING

Purge or purging is the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration or other operating condition, in such a manner that replacement air or gas is required to purify the confinement.

1.18 VENTING

Venting is the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration or other operating condition, in such a manner that replacement air or gas is not provided or required during venting. Vent, used in system names, does not imply a venting process.

See 1.1

Add 5.5.2 — A22

Add systems included in 5.5.2 — M13

Add 5.5.3 — A22

Add 5.5.4 — M11

Add 5.5.5 — M5

Supplement 4

A1

[5.5.9.d.5]

5.5.7.b

(4) Unscheduled inspections shall be conducted in accordance with Specification 4.2.5.1.1 on any steam generator with primary-to-secondary tube leakage (not including leaks originating from tube-to-tube sheet welds) exceeding Specification 3.1.5.3. 3.4.13

All steam generators shall be inspected before returning to power in the event of a seismic occurrence greater than an operating basis earthquake, a LOCA requiring actuation of engineering safeguards, or a main steam line or feedwater line break.

4.2.1.5
[5.5.9.e]

Acceptance Limits

Definitions:

Imperfection is an exception to the dimension, finish, or contour of a tube from that required by fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections.

Degradation means a service induced cracking, wastage, wear, or general corrosion occurring on either inside or outside of a tube.

Degraded Tube is a tube that contains imperfections caused by degradation equal to or greater than 20% of the nominal tube wall thickness.

Defect is an imperfection of such severity that it exceeds the plugging limit. A tube containing a defect is defective.

Plugging Limit is the imperfection depth beyond which a degraded tube must be removed from service by plugging, because the tube may become defective prior to the next scheduled inspection of that tube. The plugging limit is 47% of the nominal tube wall thickness if the next inspection interval of that tube is 12 months, and a 2% reduction in the plugging limit for each 12 month period until the next inspection of the inspected steam generator.

4.2.1.8
[5.5.9.f]

Corrective Measures

All tubes that leak or are determined to have degradation exceeding the plugging limit shall be plugged prior to return to power.

4.2.1.3

Reports

See 5.6

1. After each inservice examination, the number of tubes plugged in each steam generator shall be reported to the Commission as a Special Report within 14 days after completion of tube plugging.

2. The complete results of the steam generator tube inservice inspection shall be included in the Operating Report for the period in which the inspection was completed.

Add 5.5.10 — A22

Supplement 4

Specification 5.5

A1

ITS

[5.5.12]

Objective

To ascertain that the concentration of hydrogen and oxygen in the Waste Gas Decay Tanks is maintained as low as reasonably achievable and within allowable limits.

Specification

4.20.4.1 The concentration of hydrogen and oxygen in the Waste Gas Decay Tanks shall be determined to be within the limits specified in Specification 3.16.4.1 by monitoring the waste gases in the Waste Gas Decay Tanks with the hydrogen and oxygen monitors or monitoring procedures required operable by Table 3.5-7 of Specification 3.5.3.1.

LA10

4.20.5 Waste Gas Decay Tanks (Radioactive Material)

Applicability

Applies to the Waste Gas Decay Tanks.

Objective

To ascertain that the quantity of radioactive material in the Waste Gas Decay Tanks is maintained as low as reasonably achievable and within allowable limits.

Specification

4.20.5.1 With the primary coolant activity ≥ 100 μCi/ml the quantity of radioactive material contained in each Waste Gas Decay Tank shall be determined to be within the limit specified in Specification 3.16.5.1 once per 24 hours when radioactive materials are being added to the tank.

Add 5.5.13 — M15

Add 5.5.14 — M6

Add 5.5.15 — M7

ITS

A1

LA13

Startup reports shall be submitted within (1) 90 days following completion of the startup test program, (2) 90 days following resumption of commercial power operation, or (3) 9 months following initial criticality, whichever is earliest. If the startup report does not cover all three events (i.e., initial criticality, completion of startup test program, and resumption of commercial power operation), supplementary reports shall be submitted at least every three months until all three events have been completed.

L5

6.9.1.2 Annual Reports

Annual Reports covering the activities of the unit as described below for the previous calendar year shall be submitted prior to March 1 of each year. The initial report shall be submitted prior to March 1 of the year following initial criticality.

A36

Collective deep dose equivalent (reported in person-rem)

Reports required on an annual basis shall include:

[5.6.1]

1. A tabulation on an annual basis of the number of station, utility, and other personnel (including contractors) receiving exposures greater than 100 mrem/yr and their associated man rem exposure according to work and job functions (e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance [describe maintenance], waste processing, and refueling).* The dose assignments to various duty functions may be estimated based on pocket dosimeter, thermoluminescent dosimeter (TLD), or film badge measurements. Small exposures totaling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total whole body dose received from external sources should be assigned to specific major work functions.

an annual deep dose equivalent

A31

L5

deep dose equivalent

This report shall be submitted by April 30 of each year.

A36

2206

* This tabulation supplements the requirements of § 20.407 of 10 CFR Part 20.

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A1

6.9.2 Deleted

6.9.3 Special Reports

6.9.3.1 Special reports shall be submitted to the NRC within the time period specified for each report. These reports shall be submitted covering the activities identified below pursuant to the requirements of the applicable reference specification:

	Area	Reference	Submittal Date	
a)	Containment Leak Rate Testing	4.4	Upon completion of each test.	See 5.5.16
b)	Containment Sample Tendon Surveillance	4.4	Within 6 months of Upon completion of the inspection at 25 years of operation.	A34 [5.6.7]
c)	Post-Operational Containment Structural Test	4.4	Upon completion of the test at 20 years of operation.	See 5.5.16
d)	DELETED			
e)	Overpressure Protection System Operation	3.1.2.1.e	Within 30 days of operation.	See 3.4.12
f)	Auxiliary Feedwater Pump	3.4	Within 30 days after becoming inoperable.	See 3.7.4

ITS

[5.6.8]

(A1)

(e) Unscheduled inspections shall be conducted in accordance with Specification 4.2.5.1.2 on any steam generator with primary-to-secondary tube leakage (not including leaks originating from tube-to-tube sheet welds) exceeding Specification 3.1.5.3.

All steam generators shall be inspected before returning to power in the event of a seismic occurrence greater than an operating basis earthquake, a LOCA requiring actuation of engineering safeguards, or a main steam line or feedwater line break.

4.2.1.1.5 Acceptance Limits

See 5.5.9

Definitions:

Imperfection is an exception to the dimension, finish, or contour of a tube from that required by fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections.

Degradation means a service induced cracking, wastage, wear, or general corrosion occurring on either inside or outside of a tube.

Degraded Tube is a tube that contains imperfections caused by degradation equal to or greater than 20% of the nominal tube wall thickness.

Defect is an imperfection of such severity that it exceeds the plugging limit. A tube containing a defect is defective.

Plugging Limit is the imperfection depth beyond which a degraded tube must be removed from service by plugging, because the tube may become defective prior to the next scheduled inspection of that tube. The plugging limit is 47% of the nominal tube wall thickness if the next inspection interval of that tube is 12 months, and a 2% reduction in the plugging limit for each 12 month period until the next inspection of the inspected steam generator.

4.2.1.2 Corrective Measures

All tubes that leak or are determined to have degradation exceeding the plugging limit shall be plugged prior to return to power.

[5.6.8] 4.2.1.3 Reports

a. ~~1.~~ After each inservice examination, the number of tubes plugged in each steam generator shall be reported to the Commission as a Special Report within 14 days after completion of tube plugging.

b. ~~2.~~ The complete results of the steam generator tube inservice inspection shall be included in the Operating Report for the period ~~on which~~ beginning after the inspection ~~was~~ is completed. L9

ITS

(A1)

[5.7] 6.13 HIGH RADIATION AREA

[5.7.1] 6.13.1 In lieu of the "control device" or "alarm signal" required by paragraph 20.1601(a) of 10 CFR 20, each High Radiation Area in which the intensity of radiation is 1000 mRem/hr or less shall be barricaded and consipcuously posted by requiring issuance of a Radiation Work Permit (RWP).* Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

a. A radiation monitoring device which continuously indicates the radiation dose rate in the area.

b. A radiation monitoring device provided for each individual which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate levels in the area have been established and personnel have been made knowledgeable of them.

c. An indvidual qualified ~~in~~ as a radiation ~~protection procedures~~ control technician who is equipped with a radiation dose monitoring device. This individual shall be responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the Radiation Control Supervisor in the Radiation Work Permit.

(LA21)

[5.7.2] 6.13.2 The requirements of ~~6.13.1~~ 5.7.1 above shall apply to each high radiation area in which the intensity of radiation is greater than 1000 mRem/hr at 30 centimeters (12 inches) from the radiation source or from any surface penetrated by the radiation, but less than 500 rads/hour at 1 meter from the radiation source or from any surface penetrated by the radiation. In addition, locked doors shall be provided to prevent ~~unauthorized~~ inadvertent entry into such areas and the keys shall be maintained under the administrative control of the ~~Operations Shift Supervisor~~ Shift Superintendent on duty and/or the Radiation Control Supervisor. Entrance there to shall also be controlled by requiring issuance of a Radiation Work Permit. The footnote for Section ~~6.13.1~~ 5.7.1 is not applicable to each high radiation area in which the intensity of radiation is greater than 1000 mRem/hr.

(A28) (LA21) (A37)

* ~~Health Physics~~ Radiation control personnel or personnel escorted by ~~Health Physics~~ Radiation control personnel shall be exempt from RWP issuance rquirement during the performance of their assigned duties within the RCA, provided they comply with approved radiation protection procedures for entry into high radiation areas.

ADMINISTRATIVE CHANGES

A1 In the conversion of the H. B. Robinson Steam Electric Plant (HBRSEP), Unit 2 Current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS) certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make ITS consistent with the conventions in the Standard Technical Specifications, Westinghouse Plants, NUREG 1431, Revision 1 (i.e., Improved Standard Technical Specifications (ISTS)). These changes are administrative, and have no adverse impact on safety.

A2 CTS Specification 6.1.1 is revised in ITS Specification 5.1.1 (second paragraph) to require that the "plant manager or his designee," approve, prior to implementation, each proposed test, experiment and modification that affects nuclear safety. This change replaces portions of CTS Specifications 6.5.1.1.4 and 6.5.1.2.3, which require that the Vice President-Robinson Nuclear Project (or designated alternate), or the plant manager (or designated alternate) approve proposed tests, experiments, and modifications that do not involve an unreviewed safety question, prior to implementation. This change is consistent with the current licensing basis, which will be maintained. A system of designated "approvers" is maintained such that managers of functional areas affected by proposed tests and experiments (in the form of procedures) are designated in writing by the Vice President as authorized "approvers." Proposed modifications are approved, prior to implementation by the plant manager, or designated alternate. Although the Vice President position is replaced by the Plant Manager, the CTS permits a designated alternate who can be the Plant Manager. Consequently, there is no change in permitted approval authority. Since the proposed change does not change any technical requirements, nor does it change the system of approval for proposed tests, experiments and modifications which affect nuclear safety, it is administrative, and has no adverse impact on safety. This change is consistent with NUREG-1431.

A3 CTS Specification 6.2.1.a is revised in ITS Specification 5.2.1 to delete the phrase, "and updated in accordance with 10 CFR 50.71(e)." The required frequencies for updating the UFSAR are specified in 10 CFR 50.71(e), and need not be repeated in the ITS. This change is administrative, and has no adverse impact on safety.

A4 CTS Specification 6.2.1.e, which allows for health physics personnel to report to an appropriate onsite manager for matters relating to radiological health and safety, is revised in presentation in ITS Specification 5.2.1.d, to permit the individuals who carry out radiation control functions to report to the appropriate onsite manager, but require that they have sufficient organizational freedom to ensure their

independence from operating pressures. This change is administrative, and has no adverse impact on safety.

A5 CTS Specifications 6.2.3.a, 6.2.3.c, and 6.2.3.g, which identify shift manning requirements under certain operational conditions, are not retained in ITS Specification 5.2.2. These requirements are contained in 10 CFR 50.54(m)(2), and need not be repeated in the ITS. This change is administrative, and has no adverse impact on safety.

A6 CTS Specification 6.2.3.b, which provides guidelines on the use of overtime, is revised in ITS Specification 5.2.2.e to add the statement, "The objective shall be to have operating personnel work a 12 hour day, nominal 40 hour week, while the unit is operating," to clarify that the normal work shift for the operating crews is 12 hours, with an average work week in the 40 hour range while the unit is on line. Although not specified as an objective in CTS, this statement is consistent with current practice. Therefore, this change is administrative, and has no adverse impact on safety.

A7 CTS Specification 6.2.3.b, which requires that deviations from the guidelines on use of overtime be authorized by the plant manager, is revised in ITS Specification 5.2.2.e to specify that such deviations be authorized "in accordance with approved administrative procedures." Since the CTS Specification currently requires administrative procedures for limiting working hours, this change serves to emphasize that such administrative procedures apply to deviations from the guidelines as well. This change is administrative, and has no adverse impact on safety.

A8 CTS Specifications 6.5.1.1.1.b and 6.5.1.1.1.c, which require procedures for refueling operations and surveillance and test activities, are not retained in ITS Specification 5.4.1. Since these types of procedures are also required by CTS Specification 6.5.1.1.1.a (ITS Specification 5.4.1.a), which references Regulatory Guide 1.33, it is not necessary to specifically identify them again in the ITS. This change is administrative, and has no adverse impact on safety.

A9 Not used.

A10 CTS Specifications 6.5.1.1.1.d and 6.5.1.1.1.e, which require written procedures for implementation of the Security Plan and Emergency Plan, are not retained in ITS Specification 5.4.1. Since procedure requirements for implementation of the Security and Emergency Plans are contained in 10 CFR 50.54(p), 10 CFR 50.54(t), 10 CFR 73.55(b)(3), and 10 CFR 50, Appendix E (Section V), it is not necessary to specifically identify them again in the ITS. This change is consistent with Generic Letter 93-07. This change is administrative, and has no adverse impact on safety.

A11 CTS Specifications 6.5.1.1.1.g and 6.5.1.1.1.h, which require procedures for implementation of the Radiological Environmental Monitoring Program (REMP) and Offsite Dose Calculation Manual (ODCM), are encompassed within ITS Specification 5.4.1.e, which requires procedures for all programs identified in ITS Specification 5.5, of which the REMP and ODCM are a part. This change is administrative, and has no adverse impact on safety.

A12 CTS Specification 6.16.1, which requires that the Offsite Dose Calculation Manual (ODCM) be approved by the Commission prior to implementation, is not retained in ITS Specification 5.5.1. The ODCM has already been approved by the NRC and has been implemented. Licensee initiated changes to the ODCM continue to be documented and submitted to the NRC along with the Radioactive Effluent Release Report. This change is administrative, and has no adverse impact on safety.

A13 CTS Specification 6.16.2.A is revised in ITS Specification 5.5.1.c.3 to modify presentation of the administrative details associated with documentation of changes to the ODCM. The frequency for submittal of changes to the ODCM with the Radioactive Effluent Release Report is revised from semiannual to annual (See also DOC for CTS Specification 6.9.1.3, "Semiannual Radioactive Effluent Release Report."). This change is administrative, and has no adverse impact on safety.

A14 CTS Specification 6.16.2.A.2 is revised in ITS Specification 5.5.1 to be consistent with Generic Letter 89-01 and the revised 10 CFR 20 requirements. Since the technical requirements are not modified, this change is administrative, and has no adverse impact on safety.

A15 Not used.

A16 CTS Specifications 4.4.4.1, 4.4.4.3.a (Tendon Surveillance Program), and 6.12 (Containment Leakage Rate Testing Program) are revised in the ITS to add a statement of applicability of SR 3.0.2 and/or SR 3.0.3 to the inspection frequencies, since these SRs are not normally applied to frequencies identified in the Administrative Controls Section of the Technical Specifications. This change is a clarification required to maintain provisions that are applicable in the LCO sections of the Technical Specifications. This change is administrative, and has no adverse impact on safety.

A17 The CTS Bases (and References) are not retained in the ITS, but are replaced in their entirety. The ITS includes significantly expanded and improved Bases. The Bases do not define or impose any specific requirements but serve to explain, clarify and document the reasons (i.e., Bases) for the associated Specification. The Bases are not part of the Technical Specifications required by 10 CFR 50.36. This change is administrative, and has no adverse impact on safety.

A18 CTS Specification 4.2.2, related to reactor vessel material surveillance specimens, is not retained in the ITS. Since this Specification merely states that the requirements of 10 CFR 50, Appendix H must be adhered to, it is not necessary to repeat this information in the ITS. This change is administrative, and has no adverse impact on safety.

A19 CTS Specification 4.0.1, related to the Inservice Testing (IST) Program, is revised in ITS Specification 5.5.8 to state that the IST Program provides controls for ASME Code Class 1, 2, and 3 "pumps and valves," in place of "components." 10 CFR 50.55a(f) provides the regulatory requirements for an IST Program, and specifies that ASME Code Class 1, 2, and 3 pumps and valves are the only components covered by an IST Program. 10 CFR 50.55a(g) provides regulatory requirements for an Inservice Inspection (ISI) Program, and specifies that ASME Code Class 1, 2, and 3 components are covered by the ISI Program, and that pumps and valves are covered by the IST Program in 10 CFR 50.55a(f). This change is administrative, and has no adverse impact on safety.

A20 CTS Specification 4.0.1.b, related to inservice testing program requirements, is revised in ITS Specification 5.5.8 to add the frequency notation of "at least once per 731 days," associated with ASME Boiler and Pressure Vessel Code terminology of "biennially or every 2 years." This change is administrative, and has no adverse impact on safety.

A21 CTS Specification 6.9, "Reporting Requirements," is revised in ITS Specification 5.6 to replace the sentence, "Information to be reported to the NRC, in addition to the reports required by Title 10, Code of Federal Regulations, shall be as indicated in the following sections." with "The following reports shall be submitted in accordance with 10 CFR 50.4." This change provides a more specific citation of the regulation involved. This change is administrative, and has no adverse impact on safety.

A22 The HBRSEP Unit No. 2 Facility Operating License DPR-23, paragraph 3.G(2), requires a program be implemented and maintained to reduce leakage from systems outside containment that would or could contain highly radioactive fluids during a serious transient or accident to as low as practical levels. These program requirements are duplicated in ITS Specification 5.5.2, Primary Coolant Sources Outside Containment. Facility Operating License DPR-23, paragraph 3.G(4), requires a program be implemented and maintained to ensure the capability to obtain and analyze reactor coolant, radioactive iodines, and particulates in plant gaseous effluents, and containment atmosphere samples under accident conditions. These program requirements are duplicated in ITS Specification 5.5.3, Post Accident Sampling. Facility Operating License DPR-23, paragraph 3.G(1), requires a secondary water chemistry monitoring program be implemented and maintained to inhibit steam generator tube degradation. These program requirements are duplicated in ITS Specification 5.5.10, Secondary Water Chemistry Program. These

changes are being made to achieve consistency with NUREG-1431. Since the requirements for these programs already exist in the HBRSEP Unit No. 2 Facility Opeating License, these changes (which duplicate these program requirements in the HBRSEP Unit No. 2 ITS) are considered to be administrative.

A23 CTS Specification 6.9.1.2.3, "Annual Radiological Environmental Operating Report," is revised in ITS Specification 5.6.2 to replace the phrase, "the table," with "Table 3," to more clearly identify which table in the Radiological Assessment Branch Technical Position is referred to. This change is administrative, and has no adverse impact on safety.

A24 CTS Specification 6.12, which provides requirements for containment leakage rate testing, is revised in ITS Specification 5.5.16 to delete the statement which indicates that the provisions of Technical Specification 4.0 do not apply. ITS SR 3.0.1 through SR 3.0.4 provide requirements and provisions for SRs. Since there are no SRs in ITS Chapter 5, SR 3.0.1 through SR 3.0.4 provisions are generically not applied to the requirements specified in ITS Chapter 5. Therefore, it is not necessary to state that SR 3.0.2 <u>is not</u> applicable. Conversely, the statement that SR 3.0.3 <u>is</u> appliable is appropriate. Since the ITS Section 3.0 LCOs and SRs typically do not apply to the "Administrative Controls" Chapter, it is reasonable to specifically state when they do apply. Additionally, ITS Specification 5.5.16 describes the Containment Leakage Rate Testing Program, which is conducted in accordance with 10 CFR 50, Appendix J. The testing frequencies are specified in Appendix J, and cannot be modified through the Technical Specifications. This change is administrative, and has no adverse impact on safety.

A25 CTS Specification 6.9.3.3.a, which sets forth requirements for the Core Operating Limits Report (COLR), is revised in ITS Specification 5.6.5 to add the boron concentration limit required by ITS LCO 3.9.1 consistent with the proposed relocation of this limit from CTS Specification 3.8.1.f. This change is administrative, and has no adverse impact on safety.

A26 CTS Specification 6.9.3.3.d, which sets forth the submittal requirements for the COLR, is revised in ITS Specification 5.6.5 to replace the phrase, "Document Control Desk with copies to the Regional Administrator and Resident Inspector," with "NRC." This change is administrative, and has no adverse impact on safety.

A27 CTS Specifications 4.4.4.2, 4.4.4.3.b, and 6.9.3.1.c are not retained in the ITS, since the 20 year post-operational containment structural test has already been performed with satisfactory results, and the report submitted to the NRC. No further structural testing is required. This change is administrative, and has no adverse impact on safety.

A28 CTS Specification 6.13.2, which requires that locked doors be provided to prevent unauthorized entry into high radiation areas, is revised in ITS Specification 5.7.2, "High Radiation Area." The term, "unauthorized," is replaced with the term, "inadvertent," to clarify that the purpose of locked doors in high radiation is to prevent inadvertent entry for personnel safety, rather than to prevent unauthorized entry from a security perspective. This change is administrative, and has no adverse impact on safety.

A29 CTS Specifications 6.6.1.a and 6.6.2.a, which contain requirements regarding notification and submittal of reports to the NRC pursuant to the requirements of 10 CFR 50.72 and 10 CFR 50.73, are not retained in the ITS. These reporting requirements are specified within the cited regulations and need not be repeated in the ITS. This change is administrative, and has no adverse impact on safety.

A30 CTS Specification 6.2.3.a is revised in ITS Specification 5.2.2 to incorporate the current plant practice regarding the function of the shift technical advisor. Since no technical requirements are modified, this change is administrative, and has no adverse impact on safety.

A31 CTS Specification 6.9.1.2.1, which specifies occupational radiation exposure reporting requirements, is modified in ITS Specification 5.6.1, where examples of work and job functions identified as, "routine maintenance, special maintenance [describe maintenance]," are condensed to simply read, "maintenance," to be consistent with other examples given. This change is administrative, and has no adverse impact on safety.

A32 CTS Specifications 4.2.3 (Primary Pump Flywheels) and 6.12 (Containment Leakage Rate Testing Program), are revised in ITS Specifications 5.5.7 and 5.5.16, respectively to modify the presentation of text to be consistent with the presentation of purpose statements of other programs in this Chapter. Since no technical requirements are modified, this change is administrative and has no adverse impact on safety.

A33 The CTS is revised to adopt ISTS Specification 5.5.12, "Explosive Gas and Storage Tank Radioactivity Monitoring Program," in the ITS. This program captures the existing requirements for explosive gas and storage tank radioactivity contained in CTS Specifications 3.16.2, 3.16.4, 3.16.5,4.20.2, 4.20.4, and 4.20.5. Consequently, the adoption of this program is an administrative change, and is consistent with NUREG-1431.

A34 CTS 4.4.4.3.c requires submitting a report and evaluation of a Containment Tendon Test within 6 months of completing the test. CTS 4.4.4.1 requires performance of a containment tendon inspection after 5 years of operation and 25 years of operation. CTS 6.9.3 refers to submittal of the Containment Tendon Surveillance Report upon completion of the inspection at 25 years of operation. (The CTS 6.9.3 reference

reporting the inspection upon completion of the tendon test at 25 years of operation is an imprecise restatement of the actual test requirement specified in CTS 4.4.4.1 and reporting requirement specified in 4.4.4.3.c.) ITS 5.6.7 requires reporting containment tendon test results within 6 months after completion of the test. This is consistent with the current licensing basis for HBRSEP Unit No. 2 and the comparable STS requirement which also does not require performance of the test at any specific time (i.e., after 25 years of operation). CTS 4.4.4.1 which includes schedular requirements for performance of the test is relocated to the Pre-Stressed Concrete Containment Tendon Surveillance Program. Relocation of test schedular requirements to the Pre-Stressed Concrete Containment Tendon Surveillance Program is consistent with ISTS 5.5.6 and ITS 5.5.6.

A35 CTS 6.5.1 is a general statement of objectives which is actually implemented by the more prescriptive subsections 6.5.1.1, "Procedures, Tests and Experiments"; and 6.5.1.2, "Modifications"; 6.5.1.3, "Technical Specification and License Changes, 6.5.1.4, "Review of Technical Specification Violations"; 6.5.1.5, Nuclear Safety Review Qualification"; and 6.5.1.6, "Plant Nuclear Safety Committee (PNSC)." This statement is not separately retained in the ITS since actual implementation is accomplished in accrodance with the more prescriptive subsections listed above. Therefore, deletion of this general statement is considered administrative, and has no impact on safety.

A36 The personnel exposure and monitoring reporting requirements of CTS 6.9.1.2.1 are modified in ITS 5.6.1 to reflect the revised 10 CFR 20 requirements. The revised 10 CFR 20 requirements are currently applicable to HBRSEP Unit No. 2. As a result, the change is considered to be administrative in nature in order to make the existing wording of CTS 6.9.1.2.1 consistent with the wording of the revised 10 CFR 20.

A37 CTS Specification 6.2.1.e, CTS Specification 6.2.3.b, and the *Note to CTS Specification 6.13.1. refer to requirements related to "health physics" individuals. ITS Specification 5.2.1.d, ITS Specification 5.2.2.e, and ITS Specificaiton 5.7.1 modifies this generic title to "radiation control" individuals. This change is being made to be consistent with the generic title used in the HBRSEP, Unit No. 2 UFSAR. Per UFSAR Section 12.1, "radiation control" individuals implement health physics programs and principles. Therefore, this change is considered administrative, and has no adverse impact on safety.

TECHNICAL CHANGES - MORE RESTRICTIVE

M1 CTS Specification 6.2.3.e is revised in ITS Specification 5.2.2 to reflect that one of the two licensed operators required to be present in the control room during certain operating conditions must be licensed as an SRO. The phrase, "during reactor start-up, scheduled reactor shutdown, and during recovery from reactor trips," is revised to read, "when in MODES 1, 2, 3, and 4" in ITS Specification 5.2.2. These changes are necessary to establish consistency with the NUREG and are consistent with existing requirements in 10 CFR 50.54. This change imposes more restrictive requirements, and has no adverse impact on safety.

M2 CTS Specification 6.5.1.1.1, related to procedure requirements, is revised to adopt ISTS Specification 5.4.1.b in the ITS, which requires that procedures be established covering the emergency operating procedures required to implement NUREG-0737 commitments. This change is necessary to establish consistency with the NUREG and is consistent with existing requirements in Appendix B to 10 CFR 50. This change imposes new requirements which are more restrictive, and has no adverse impact on safety.

M3 CTS Specification 6.5.1.1.1, related to procedure requirements, is revised to adopt ISTS Specification 5.4.1.e in the ITS, which requires that each program specified in ITS Section 5.5 have written procedures established, implemented and maintained. Specifically, those programs for which this is a new requirement are 1) Component Cyclic or Transient Limits, 2) Technical Specification Bases Control Program, and 3) Safety Function Determination Program. This change establishes consistency with the NUREG. The requirement to have written procedures for the programs established in ITS Section 5.5 does not impose a significant burden upon plant operations and is consistent with existing administrative requirements This change imposes new requirements which are more restrictive, and has no adverse impact on safety.

M4 CTS Specification 6.16.2.B, which requires that changes to the Offsite Dose Calculation Manual (ODCM) become effective upon review and acceptance of the Plant Nuclear Safety Committee (PNSC), is revised in ITS Specification 5.5.1.c.2 to require that changes to the ODCM become effective upon approval of the plant manager. While the plant manager is the Chairman of the PNSC, the actual composition of the PNSC is proposed to be relocated to the Quality Assurance Program Description (Refer to LA1). This change establishes consistency with the NUREG and does not impose a significant burden upon plant operations. The specification of the plant manager imposes a requirement that is more restrictive, and the change has no adverse impact on safety.

M5 The CTS is revised to adopt ISTS Specification 5.5.5, "Component Cyclic or Transient Limit" in the ITS as a program to track UFSAR Table 3.9.1-1

cyclic and transient occurrences to ensure that components are maintained within their design limits. This change is necessary to establish consistency with the NUREG and does not impose a significant burden upon plant operations. This change imposes new requirements which are more restrictive, and has no adverse impact on safety.

M6 The CTS is revised to adopt ISTS Specification 5.5.14, "Technical Specifications (TS) Bases Control Program" in the ITS, which provides a means for processing changes to the Bases of the Technical Specifications. This change is necessary to establish consistency with the NUREG and does not impose a significant burden upon plant operations. This change imposes new requirements which are more restrictive, and has no adverse impact on safety.

M7 The CTS is revised to adopt ISTS Specification 5.5.15, "Safety Function Determination Program (SFDP)" in the ITS, which ensures any loss of safety function is detected and that appropriate actions are taken. This change is necessary to establish consistency with the NUREG and does not impose a significant burden upon plant operations. The establishment of the safety function determination program ensures that entry into multiple conditions of one or more LCOs, while permitted, does not result in a loss of the safety function resulting from interactions of the multiple conditions for an extended period of time. This change imposes new requirements which are more restrictive, and has no adverse impact on safety.

M8 CTS Specification 6.9.3.3.c, related to core operating limits, is revised in ITS Specification 5.6.5 to add Emergency Core Cooling System (ECCS) limits to those limits of the safety analysis which must be met. This change is necessary to establish consistency with the NUREG and does not impose a significant burden upon plant operations. This change imposes new requirements which are more restrictive, and has no adverse impact on safety.

M9 CTS Specification 4.4.4.1 (Inspection of Surveillance Tendons), 4.2.3 (Primary Pump Flywheels) is revised in ITS Specification 5.5.6 to incorporate additional details of the description of the Program. This change is necessary to establish consistency with the NUREG and does not impose a significant burden upon plant operations. Since this change imposes new requirements, this change is more restrictive, and has no adverse impact on safety.

M10 CTS Specification 6.9.1.2.4 which requires that primary safety and relief valve challenges be included in an annual report, is revised to be included in ITS Specification 5.6.4 to include primary safety and relief valve challenges in the Monthly Operating Report. This change is necessary to establish consistency with the NUREG and does not impose a significant burden upon plant operations. This change is more restrictive, and has no adverse impact on safety.

M11 The CTS is revised to adopt ISTS Specification 5.5.4, Radioactive Effluent Controls Program," in the ITS. This program provides controls for the relocated requirements for control of radioactive effluents contained in the CTS Radiological Environmental Technical Specifications (RETS). This change is necessary to establish consistency with the NUREG and does not impose a significant burden upon plant operations. The addition of a program is more restrictive, and this change has no adverse impact on safety.

M12 CTS Specification 6.16.1, "Offsite Dose Calculation Manual," is revised to adopt ISTS Specification 5.5.1.b in the ITS, to specify additional content requirements for the ODCM. This change is necessary to establish consistency with the NUREG and does not impose a significant burden upon plant operations. The addition of radioactive effluent controls, radiological environmental monitoring activities and descriptions of the information to be included in the Annual Radiological Environmental, Operating, and Radioactive Effluent Release Reports to the ODCM is more restrictive, and has no adverse impact on safety.

M13 Facility Operating License DPR-23, paragraph 3.G(2), which is related to reducing leakage from systems outside containment that would or could contain highly radioactive fluids during a serious transient or accident to as low as practical levels is duplicated in ITS Specification 5.5.2. ITS Specification 5.5.2 is revised to incorporate those systems to which this Specification applies, consistent with NUREG-1431. This change is necessary to establish consistency with the NUREG and does not impose a significant burden upon plant operations. The addition of specific systems to which the Specification applies is more restrictive, and has no adverse impact on safety.

M14 CTS requirements comparable to ITS 5.1.2 do not exist. ITS 5.1.2 specifies requirements for the control room command function and requirements for designation of another individual when the specified individual is absent from the control room. These additional requirements are more restrictive requirements upon unit operations and are consistent with the ISTS. The requirement for the control room command function and associated designation requirements ensure clear understanding of organization authority and responsibility regarding control room activities. This requirement is also consistent with current practice and therefore has no significant impact.

M15 The CTS is revised to adopt ISTS Specification 5.5.13, "Diesel Fuel Oil Testing Program" in the ITS. This program captures, in general terms, the existing requirements for Diesel Fuel OIl Testing contained in CTS Table 4.1.2, Items 11 and 12. CTS Table 4.1.2, items 11 and 12 provide for sampling of the stored fuel oil but does not contain requirements for new fuel oil. Currently at HBRSEP, Unit No. 2, the acceptability of new fuel oil is verified by the use of a certificate of compliance

provided by the diesel fuel supplier for each new fuel oil delivery. The certificate of compliance includes certification of each of the new fuel oil properties included in ISTS 5.5.13.a. Therefore, to maintain consistency with this current practice an additional requirement is provided. HBRSEP ITS 5.5.13 (Diesel Fuel Oil Testing Program) states the purpose of the program is to establish the acceptability of new fuel oil for use prior to addition to the storage tanks by determining that the new oil has not become contaminated with other products during transit, thus altering the quality of the fuel oil. This is an additional restriction upon unit operation to assure the quality of the fuel oil is maintained.

TECHNICAL CHANGES - LESS RESTRICTIVE (GENERIC)

LA1 CTS Specifications 6.5.1.1.2 through 6.5.1.1.7, 6.5.1.2 through 6.5.1.6, 6.5.2, 6.6.1.b, and 6.6.2.b, set forth requirements for review and approval of changes, tests, and experiments, Plant Nuclear Safety Committee, Nuclear Assessment Section (NAS) independent review, and reportable event reviews. This detail is not retained in the ITS and is relocated to the Quality Assurance Program Description (QAPD). Changes to the QAPD are controlled in accordance with 10 CFR 50.54(a).

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, since the requirements are adequately addressed in 10 CFR 50.59, ANSI N18.7, or other applicable regulations and standards. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA2 CTS Specification 6.2.1.e require that the manager responsible for health physics have direct access to that onsite individual having responsibility for overall unit management, and that health physics personnel have the authority to stop work when warranted for safety or unnecessary radiation exposures. This detail is not retained in the ITS and is relocated to licensee controlled documents.

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, since the requirements are adequately addressed in 10 CFR 50, ANSI N18.7, or other applicable regulations and standards. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA3 CTS Specification 6.2.3.h, requires that no shift position be unmanned upon shift change due to an oncoming shift member being late or absent. This detail is not retained in the ITS and is relocated to licensee controlled documents.

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains requirements for minimum shift

staffing. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA4 CTS Specification 6.5.1.1.1.j requires that procedures covering quality assurance activities for effluent and environmental monitoring use the guidance provided in Regulatory Guide 4.15, December 1977. This detail is not retained in the ITS and is relocated to licensee controlled documents.

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains the requirement that written procedures cover quality assurance activities related to effluent and environmental monitoring. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA5 Not used.

LA6 CTS Specification 4.4.3 requires leakage testing of the Post Accident Recirculation Heat Removal System. This detail is not retained in the ITS and is relocated to licensee controlled documents.

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, because programmatic controls are incorporated in ITS Specification 5.5.2, which is consistent with NUREG-1431. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA7 CTS Specifications 4.4.4.1 and 4.4.4.3.a, require periodic containment surveillance tendon inspections. This detail is not retained in the ITS and is relocated to licensee controlled documents.

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, because programmatic controls are incorporated in ITS Specification 5.5.6, which is consistent with NUREG-1431. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA8 CTS Specification 4.2.3, requires periodic reactor coolant pump flywheel inspections. This detail is not retained in the ITS and is relocated to licensee controlled documents.

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, because programmatic controls are incorporated in ITS Specification 5.5.7, which is consistent with NUREG-1431. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA9 CTS Specifications 3.8.2, 4.12, and 4.15 provide operational requirements and surveillances for refueling, refueling filter systems, and the Control Room Air Conditioning System. This detail is not retained in the ITS and is relocated to licensee controlled documents.

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, since the ITS still retains the requirements for HEPA and charcoal filter OPERABILITY. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA10 CTS Specifications 3.16.2, 3.16.4, 3.16.5, 4.20.2, 4.20.4, and 4.20.5 provide operational requirements and surveillances for explosive gas and storage tank radioactivity in radwaste systems. This detail is not retained in the ITS and is relocated to licensee controlled documents.

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, because programmatic controls are incorporated in ITS Specification 5.5.12, which is consistent with NUREG-1431. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA11 CTS Specification 6.9.1.4, "Monthly Operating Report," is revised in ITS Specification 5.6.4 to eliminate instructions related to following Regulatory Guide reporting formats in accordance with the instructions provided. This detail is not retained in the ITS and is relocated to licensee controlled documents.

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, since ITS Specification 5.6.4 maintains the requirement of a Monthly Operating Report, which is consistent with NUREG-1431. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA12 CTS Specifications 6.5.3 and 6.5.4 provide process guidance and requirements related to review and audit activities of the Nuclear Assessment Section, and details related to the Outside Agency Inspection and Audit Program. This detail is not retained in the ITS and is relocated to the Quality Assurance Program Description (QAPD). Changes to the QAPD are controlled in accordance with 10 CFR 50.54(a).

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, since the requirements are adequately addressed in ANSI N18.7, or other applicable industry standards. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA13 CTS Specification 6.9.1.1 requires that a Startup Report be submitted to the NRC. This detail is not retained in the ITS and is relocated to licensee controlled documents.

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, because the Startup Report only provides a mechanism for an after-the-fact review of licensee activities, but has no requirement for NRC approval once the report is submitted. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA14 CTS Specifications 6.9.1.3.7 and 6.17 provide requirements for reporting major changes to radioactive liquid, gaseous and solid waste treatment systems. These requirements are relocated to the ODCM. Control regarding changes to the ODCM are contained in ITS 5.5.1, Offsite Dose Calculation Manual (ODCM). Relocation of these provisions is consistent with the guidance in Generic Letter 89-01.

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, because such reports only provide a mechanism for an after-the-fact review of licensee activities, and have no requirement for NRC approval once the report is submitted. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA15 CTS Specification 6.9.3.3.b contains parenthetical phrases which identify the specifications associated with each methodology used to determine core operating limits. This detail is not retained in the ITS and is relocated to The COLR.

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, because such information is provided for reference, and has no specific action associated with it. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall

operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA16 CTS Specification 6.9.3.2 provides requirements and details for reporting exceeding the limits of radiological effluent specifications. This detail is not retained in the ITS and is relocated to the ODCM. Control regarding changes to the ODCM are contained in ITS 5.5.1, "Offsite Dose Calculation Manual (ODCM)." Simplication of the Specification and relocation of the reporting details is consistent with phylosophy provided in Generic Letter 89-01 which provides for implementation of programmatic controls in the Administrative Controls Section of Technical Specification and relocation of procedural details to the ODCM or PCP. Control regarding changes to the ODCM are contained in ITS 5.5.1, Offsite Dose Calculation Manual (ODCM).

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, since the requirements are also contained in 10 CFR 20, 10 CFR 50, and 40 CFR 190. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA17 CTS 6.5.1.1.1.i requirements are relocate to the QAPD. A revised QAPD will be provided prior to implementation.

The CTS 1.15 definition of the PCP and CTS 6.15, change control for the PCP are relocated to the TRM. At the time of implementation the TRM will be incorporated by reference into the UFSAR.

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, because the Process Control Program implements the requirements of 10 CFR 20, 10 CFR 61, and 10 CFR 71. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA18 CTS Specification 6.4.1 provides requirements for retraining and replacement training for the plant staff. This detail is not retained in the ITS and is relocated to licensee controlled documents.

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, because training and qualification requirements are adequately addressed in 10 CFR 120. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA19 CTS Specification 6.10 provides a list of records that must be retained. This detail is not retained in the ITS and is relocated to the Quality Assurance Program Description (QAPD). Changes to the QAPD are controlled in accordance with 10 CFR 50.54(a).

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, since the record retention program is described in UFSAR Section 17.3, "Quality Assurance Program Description." This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA20 CTS Specification 6.11 requires that procedures for personnel radiation protection be prepared in accordance with 10 CFR 20. This detail is not retained in the ITS and is relocated to licensee controlled documents.

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, because these types of procedures are also required by ITS Specification 5.4.1.a, which references Regulatory Guide 1.33. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA21 Where possible, plant specific management titles in the CTS are relocated to licensee controlled documents and replaced with generic titles as generally provided in ANSI/ANS 3.1. Personnel who fulfill these positions are still required to meet the qualification requirements detailed in ITS Specification 5.3. In addition, compliance

details relating to the plant specific management position titles fulfilling the duties of these generic positions will continue to be defined, established, documented and updated in accordance with ITS Specification 5.2.1.a. This approach is consistent with Generic Letter 88-06, which recommended as a line item improvement, relocation of the corporate and plant organization charts to licensee controlled documents. The intent of the Generic Letter, and of this change, is to reduce the unnecessary burden on NRC and licensee resources being used reorganizations.

The specific replacements are:

5.1.1 5.2.1.b 5.2.2.e 5.5.1.c.2	plant manager for General Manager-Robinson Plant
5.2.2.g 5.7.2	shift superintendent (SS) for Operations Shift Supervisor
5.2.1.b	corporate officer for Senior Vice President - Nuclear Generation
5.2.2.d 5.7.1.c	an individual qualified as a radiation control technician for an individual qualified in radiation protection procedures
5.2.2.f	operations manager for Manager-Operations
5.2.2.f	superintendent in charge of the operations shift crews for Manager-Shift Operations
5.2.2.g 5.3.1	shift technical advisor (STA) for Shift Technical Advisor
5.3.1	manager of the radiation control function for Manager - Environmental and Radiation Control
5.7.1 5.7.2	radiation control supervisor for Radiation Control Supervisor

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, because the generic titles assure an adequate level of responsibility and qualification. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these

requirements will be reduced. Therefore, relocation of these details is acceptable.

LA22 CTS Specifications 6.9.1.2 (Annual Reports), 6.9.1.2.3 (Annual Radiological Environmental Operating Report) and 6.9.1.3 (Semiannual Radioactive Effluent Release Report) are revised in ITS Specifications 5.6.1, 5.6.2 and 5.6.3 to require that the material provided in the reports be consistent with the objectives of the Offsite Dose Calculation Manual, the Process Control Program, and with 10 CFR 20, 10 CFR 50.36a and 10 CFR 50, Appendix I. In making this change, many of the details provided in the CTS are not retained in the ITS and are relocated to the ODCM. Controls regarding changes to the ODCM are retained in accordance with ITS 5.5.1, Offsite Dose Calculation Manual. Simplification of the Specification and relocation of the details is consistent with guidance provided in Generic Letter 89-01 which provides for implementation of programmatic controls in the Administrative Controls Section of Technical Specification and relocation of procedural details to the ODCM or PCP. Control regarding changes to the ODCM are contained in ITS 5.5.1, Offsite Dose Calculation Manual (ODCM).

The details associated with the involved Specifications are not required to be in the ITS to provide adequate protection of the public health and safety, because they are already controlled by the cited programs and regulations. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational or reporting requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

LA23 CTS Specification 6.9.3.3.a, which sets forth requirements for the Core Operating Limits Report (COLR), and includes reference to "K(Z), and Power Factor Multiplier ($PF_{\Delta H}$)." These terms "K(Z), and Power Factor Multiplier ($PF_{\Delta H}$)," are relocated to the COLR as part of ITS Specification 3.2.2, "Nuclear Enthalpy Rise Hot Channel Factor ($F^N_{\Delta H}$)".

The details associated with the involved Specification are not required to be in the ITS to provide adequate protection of the public health and safety, because they are already controlled by the COLR. This approach provides an effective level of regulatory control and provides for a more appropriate change control process. The level of safety of facility operation is unaffected by the change because there is no change in the overall operational requirements. Furthermore, NRC and licensee resources associated with processing license amendments to these requirements will be reduced. Therefore, relocation of these details is acceptable.

TECHNICAL CHANGES - LESS RESTRICTIVE (SPECIFIC)

L1 CTS Specification 6.2.3.f, which requires that an individual qualified in radiation protection procedures be on site when there is fuel in the reactor, is revised in ITS Specification 5.2.2 to add a sentence which permits this position to be vacant for up to 2 hours. This is a relaxation of requirements, which is less restrictive, but is realistic since unexpected absences can, and do, occur. This change is acceptable, however, considering the unlikelihood of a radiological occurrence during the period of absence, and the added provision of the Specification that requires immediate action be taken to fill the position. This change is consistent with NUREG-1431.

L2 CTS Specification 6.2.3.h, which allows the operating shift complement to be one less than minimum requirement for up to 2 hours, is revised in ITS Specification 5.2.2 to delete the word "one." This allowance for the absence of more than "one" shift crew member is a relaxation of requirements, which is less restrictive, but is realistic since unexpected absences can, and do, occur. The impact of the proposed change is that it raises the threshold for reporting a less-than-full-complement condition as a violation of the Technical Specifications. This change is acceptable, however, in that it requires immediate action be taken to fill the position, and does not negate the requirement that such a condition shall not exceed two hours. Additionally, Footnote 1 to the Minimum Staffing Table in 10 CFR 50.54(m) permits temporary deviations from the required staffing numbers as established in the unit's Technical Specifications. This change is consistent with NUREG-1431.

L3 CTS Specification 6.3.2, which requires that the "Manager - Operations" hold, or have held, an SRO license, and, that the "Manager - Shift Operations" hold an SRO license, is revised in ITS Specification 5.2.2.f to require that either the "operations manager" or the "superintendent in charge of the operations shift crews" hold an SRO license. The superintendent in charge of the shift crews is an off-shift manager reporting to the Manager Operations who can be delegated the Manager Operations duties. This is a relaxation of requirements, which is less restrictive. 10 CFR 55 requires that an individual that directs the licensed activities of licensed operators hold an SRO license. The on shift Superintendent Shift Operations (SSO) who is in command of the control room meets this requirement. This change is acceptable, since the Technical Specification requirements will continue to assure that the individual with direct control of the operations shift crews holds an SRO license.

L4 CTS Specification 6.3.3, which requires that the manager of the radiation protection function meet or exceed the qualifications of Regulatory Guide 1.8, September 1975, is revised in ITS Specification 5.3.1 to require that the manager of the radiation protection function

meet or exceed the minimum qualifications of ANSI/ANS 3.1-1981. In addition to other requirements, Regulatory Guide 1.8 specifies that this individual have at least five years experience in applied radiation protection, while ANSI/ANS 3.1-1981 requires only four years of such experience. This is a relaxation of requirements, which is less restrictive. This change is acceptable, however, since four years of experience provides reasonable assurance the manager of radiation protection is capable of adequately managing the radiation protection function.

L5 CTS Specifications 6.9.1.2.1 (Occupational Radiation Exposure Report) and 6.9.1.2.3 (Annual Radiological Environmental Operating Report), which require that these reports be submitted by March 1 and May 1 of each year, respectively, are revised in ITS Specifications 5.6.1 and 5.6.2 to permit these reports to be submitted by April 30 and May 15 of each year, respectively. This is a relaxation of requirements, which is less restrictive. This change is acceptable, however, because these reports cover the previous calendar year, and there is no requirement for the NRC to approve these reports. Completion and submittal of the reports is clearly not necessary to ensure safe operation of the unit during the additional time intervals provided by these changes. This change is consistent with NUREG-1431.

L6 CTS Specification 6.9.1.2.1, related to reporting requirements associated with reactor coolant exceeding specific activity limits, is not retained in the ITS. This is a relaxation of requirements, which is less restrictive. This change is acceptable, however, because reporting requirements are specified in 10 CFR 50.73, and failure to return specific activity to within specification limits in the allotted time results in a unit shutdown and those related reporting requirements. This change is consistent with NUREG-1431.

L7 CTS Specification 6.9.1.3, which requires that the Radioactive Effluent Release Report be submitted on a semiannual basis, is revised in ITS Specification 5.6.3 to require that this report be submitted on an annual basis in accordance with 10 CFR 50.36a. This is a relaxation of requirements, which is less restrictive. This change is acceptable, however, since this report covers the previous calendar year, and there is no requirement for the NRC to approve the report. Completion and submittal of the report is clearly not necessary to ensure safe operation of the unit during the additional time interval provided by the proposed change. This change is consistent with NUREG-1431.

L8 CTS Specification 6.9.1.4, which requires submittal of the Monthly Operating Report to the NRC no later than the 10th of the month following the calendar month covered by the report, is revised in ITS Specification 5.6.4 to allow the report to be submitted by the 15th of each month. This is a relaxation of requirements, which is less restrictive. This change is acceptable, however, since this report

covers the previous month, and there is no requirement for the NRC to approve the report. Completion and submittal of the report is clearly not necessary to ensure safe operation of the unit during the additional time interval provided by the proposed change. This change is consistent with NUREG-1431.

L9 CTS Specifications 4.2.1.3.2, which requires that the complete results of the Steam Generator (SG) tube inservice inspection be included in the Operating Report for the period in which the inspection was completed, is revised to permit these results to be included in the Operating Report for the period beginning after the inspection was completed. This is a relaxation of requirements, which is less restrictive. The current requirement imposes an unnecessary burden to include the inspection results in the operating report for the period in which the inspecitons are complete. If the inspections are completed late in the reporting period, there is little time to include the inspection results in the report and to then obtain appropriate review and approval of the report before the required completion date. This change requires the inspection results be included in the operating report for the subsequent reporting period. This change is acceptable, however, because this report is an after-the-fact report covering planned inspection activities, and there is no requirement for the NRC to approve these reports. Completion and submittal of the reports is clearly not necessary to ensure safe operation of the unit during the slight additional time interval provided by this change.

L10 CTS Specification 6.9.3.1.a, which requires the submittal of a Containment Leak Rate Test Report to the NRC upon completion of each containment leak rate test, is not retained in the ITS. The removal of a reporting requirement is a relaxation of requirements and is less restrictive. The removal of this reporting requirement is acceptable because the reporting requirement is not necessary to ensure safe operation of the unit. This change is consistent with 10 CFR 50, Appendix J, Option B.

RELOCATED SPECIFICATIONS

None.

5.0 ADMINISTRATIVE CONTROLS

CTS

5.1 Responsibility

[6.1.1] 5.1.1 The Plant Superintendent (manager) shall be responsible for overall unit operation and shall delegate in writing the succession to this responsibility during his absence.

[6.5.1.1.4] [6.5.1.2.3] The Plant Superintendent (manager) or his designee shall approve, prior to implementation, each proposed test, experiment or (and) modification to systems or equipment that affect nuclear safety. (2)

[M14] 5.1.2 The [Shift Supervisor (SS)] shall be responsible for the control room command function. During any absence of the (SS) from the control room while the unit is in MODE 1, 2, 3, or 4, an individual with an active Senior Reactor Operator (SRO) license shall be designated to assume the control room command function. During any absence of the (SS) from the control room while the unit is in MODE 5 or 6, an individual with an active SRO license or Reactor Operator license shall be designated to assume the control room command function.

(1) (3) Superintendent Shift Operations (SSO) SSO

5.0 ADMINISTRATIVE CONTROLS

CTS

5.2 Organization

(1)

[6.2.1] 5.2.1 Onsite and Offsite Organizations

Onsite and offsite organizations shall be established for unit operation and corporate management, respectively. The onsite and offsite organizations shall include the positions for activities affecting safety of the nuclear power plant.

[6.2.1.a] a. Lines of authority, responsibility, and communication shall be defined and established throughout highest management levels, intermediate levels, and all operating organization positions. These relationships shall be documented and updated, as appropriate, in organization charts, functional descriptions of departmental responsibilities and relationships, and job descriptions for key personnel positions, or in equivalent forms of documentation. These requirements shall be documented in the [FSAR]; (26)

lines of authority, responsibility, and communication

UFSAR

[6.2.1.c] b. The [Plant Superintendent] shall be responsible for overall safe operation of the plant and shall have control over those onsite activities necessary for safe operation and maintenance of the plant;

manager

[6.2.1.b] c. [The] [a] specified corporate [executive position] shall have corporate responsibility for overall plant nuclear safety and shall take any measures needed to ensure acceptable performance of the staff in operating, maintaining, and providing technical support to the plant to ensure nuclear safety; and

A officer

[6.2.1.d] d. The individuals who train the operating staff, carry out [health physics], or perform quality assurance functions may report to the appropriate onsite manager; however, these individuals shall have sufficient organizational freedom to ensure their independence from operating pressures.

radiation control (30)

[6.2.3] 5.2.2 Unit Staff

The unit staff organization shall include the following:

to the shift crew when fuel is in the

[6.2.3.a]
[6.2.3.c] a. [A non-licensed] operator shall be assigned [to each] reactor containing fuel and an additional [non-licensed] operator (4)

An auxiliary A auxiliary

(continued)

Supplement 4

CTS

5.2 Organization

①

5.2.2 Unit Staff (continued)

shall be assigned for each control room from which a reactor is operating in MODES 1, 2, 3, or 4.

to the shift crew while the unit ④

Two unit sites with both units shutdown or defueled require a total of three non-licensed operators for the two units.

[6.2.3.d] [6.2.3.e] b. At least one licensed Reactor Operator (RO) shall be present in the control room when fuel is in the reactor. In addition, while the unit is in MODE 1, 2, 3, or 4, at least one licensed Senior Reactor Operator (SRO) shall be present in the control room.

[6.2.3.h] c. Shift crew composition may be less than the minimum requirement of 10 CFR 50.54(m)(2)(i) and Specifications 5.2.2.a and 5.2.2.g for a period of time not to exceed 2 hours in order to accommodate unexpected absence of on-duty shift crew members provided immediate action is taken to restore the shift crew composition to within the minimum requirements.

Specifications ②

[6.2.3.f] d. A Health Physics Technician shall be on site when fuel is in the reactor. The position may be vacant for not more than 2 hours, in order to provide for unexpected absence, provided immediate action is taken to fill the required position.

An individual qualified as a radiation control technician

[6.2.3.b] e. Administrative procedures shall be developed and implemented to limit the working hours of unit staff who perform safety related functions (e.g., licensed SROs, licensed ROs, health physicists, auxiliary operators, and key maintenance personnel).

radiation control personnel ③⓪

Adequate shift coverage shall be maintained without routine heavy use of overtime. The objective shall be to have operating personnel work a [8 or 12] hour day, nominal 40 hour week while the unit is operating. However, in the event that unforeseen problems require substantial amounts of overtime to be used, or during extended periods of shutdown for refueling, major maintenance, or major plant modification, on a temporary basis the following guidelines shall be followed:

1. An individual should not be permitted to work more than 16 hours straight, excluding shift turnover time;

(continued)

Supplement 4

CTS

5.2 Organization

5.2.2 Unit Staff (continued)

2. An individual should not be permitted to work more than 16 hours in any 24 hour period, nor more than 24 hours in any 48 hour period, nor more than 72 hours in any 7 day period, all excluding shift turnover time;

3. A break of at least 8 hours should be allowed between work periods, including shift turnover time;

4. Except during extended shutdown periods, the use of overtime should be considered on an individual basis and not for the entire staff on a shift.

Any deviation from the above guidelines shall be authorized in advance by the Plant Superintendent (manager) or his designee, in accordance with approved administrative procedures, or by higher levels of management, in accordance with established procedures and with documentation of the basis for granting the deviation.

Controls shall be included in the procedures such that individual overtime shall be reviewed monthly by the Plant Superintendent (manager) or his designee to ensure that excessive hours have not been assigned. Routine deviation from the above guidelines is not authorized.

OR

[The amount of overtime worked by unit staff members performing safety related functions shall be limited and controlled in accordance with the NRC Policy Statement on working hours (Generic Letter 82-12).]

Superintendent in charge of the operations shift crews

[6.3.2] f. The Operations Manager or Assistant Operations Manager shall hold an SRO license.

During Modes 1, 2, 3 and 4, (5)

[6.2.3.a] g. The Shift Technical Advisor (STA) shall provide advisory technical support to the Shift Supervisor (SS) (SSO) in the areas of thermal hydraulics, reactor engineering, and plant analysis with regard to the safe operation of the unit. In addition, the STA shall meet the qualifications specified by the Commission Policy Statement on Engineering Expertise on Shift. (5)

If an individual that holds an SRO license also meets the STA requirements, that individual may act in both capacities.

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CTS

5.5 Programs and Manuals

(1)

5.5.1 Offsite Dose Calculation Manual (ODCM) (continued)

page that was changed, and shall indicate the date (i.e., month and year) the change was implemented.

[A22] 5.5.2 Primary Coolant Sources Outside Containment

This program provides controls to minimize (reduce) leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to levels as low as practicable. The systems include [Recirculation Spray, Safety Injection, Chemical and Volume Control, gas stripper, and Hydrogen Recombiner]. INSERT 5.5.2-1 The program shall include the following:

a. Preventive maintenance and periodic visual inspection requirements; and

b. Integrated leak test requirements for each system at refueling cycle intervals or less.

[A22] 5.5.3 Post Accident Sampling

(9)

This program provides controls that (to) ensure the capability to obtain and analyze reactor coolant, radioactive gases (iodines) (23) and particulates in plant gaseous effluents and containment atmosphere samples under accident conditions. The program shall include the following:

a. Training of personnel;

b. Procedures for sampling and analysis; and

c. Provisions for maintenance of sampling and analysis equipment.

[A15] 5.5.4 Radioactive Effluent Controls Program

This program conforms to 10 CFR 50.36a for the control of radioactive effluents and for maintaining the doses to members of the public from radioactive effluents as low as reasonably achievable. The program shall be contained in the ODCM, shall be implemented by procedures, and shall include remedial actions to

(continued)

CTS

5.5 Programs and Manuals

(1)

[A15] 5.5.4 Radioactive Effluent Controls Program (continued)

i. Limitations on the annual and quarterly doses to a member of the public from iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half lives > 8 days in gaseous effluents released from each unit to areas beyond the site boundary, conforming to 10 CFR 50, Appendix I; and (4)

j. Limitations on the annual dose or dose commitment to any member of the public due to releases of radioactivity and to radiation from uranium fuel cycle sources, conforming to 40 CFR 190.

[M5] 5.5.5 Component Cyclic or Transient Limit

This program provides controls to track the FSAR Section [ ] UFSAR Table 3.9.1-1 cyclic and transient occurrences to ensure that components are maintained within the design limits. (24)

[4.4.4.1] [4.4.4.3.a] 5.5.6 Pre-Stressed Concrete Containment Tendon Surveillance Program

This program provides controls for monitoring any tendon degradation in pre-stressed concrete containments, including effectiveness of its corrosion protection medium, to ensure containment structural integrity. The program shall include baseline measurements prior to initial operations. The Tendon Surveillance Program, inspection frequencies, and acceptance criteria shall be in accordance with Regulatory Guide 1.35, Revision 3, 1989.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Tendon Surveillance Program inspection frequencies.

[4.2.3] 5.5.7 Reactor Coolant Pump Flywheel Inspection Program

This program shall provide provides controls for the inspection of each reactor coolant pump flywheel per the recommendations of Regulatory Position C.4.b of Regulatory Guide 1.14, Revision 1, August 1975. (9)

The program shall include inspection frequencies and acceptance criteria. (12)

(continued)

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CTS

5.5 Programs and Manuals (continued)

(1)

[A22]

5.5.10 Secondary Water Chemistry Program

This program provides controls for monitoring secondary water chemistry to inhibit SG tube degradation and low pressure turbine disc stress corrosion cracking. The program shall include:

a. Identification of a sampling schedule for the critical variables and control points for these variables; (critical parameters, their) (frequency) (sampling) (and control band limits)

b. Identification of the procedures used to measure the values of the critical variables; (parameters)

c. Identification of process sampling points, which shall include monitoring the discharge of the condensate pumps for evidence of condenser in leakage;

INSERT 5.5.10-1

c. d. Procedures for the recording and management of data;

d. e. Procedures defining corrective actions for all off control point chemistry conditions; and

e. f. A procedure identifying the authority responsible for the interpretation of the data and the sequence and timing of administrative events, which is required to initiate corrective action. (Identification of) (sample results)

(9)

5.5.11 Ventilation Filter Testing Program (VFTP)

A program shall be established to implement the following required testing of Engineered Safety Feature (ESF) filter ventilation systems at the frequencies specified in [Regulatory Guide], and in accordance with [Regulatory Guide 1.52, Revision 2, ASME N510-1989, and AG-1]. (This program provides controls for implementation of) (2) (positions C.5 and C.6 of Regulatory Guide 1.52, Revision 2, March 1978) (Conducted in general conformance with ANSI N510-1975 or N510-1980)

a. Demonstrate for each of the ESF systems that an inplace test of the high efficiency particulate air (HEPA) filters shows a penetration and system bypass < [0.05]% when tested in accordance with [Regulatory Guide 1.52, Revision 2, and ASME N510-1989] at the system flowrate specified below [± 10%]. (the specified) (leakage) (the referenced standard)

[3.8.2.a]
[4.15.d.1]

ESF Ventilation System	Flowrate
[ ]	[ ]

INSERT 5.5.11-1(a)

(continued)

ITS Insert 5.5.11-1 (Ventilation Filter Testing Program (VFTP))

5.5.11 (a):

ESF Ventilation System	Penetration /Bypass	Flowrate	Reference Std
Control Room Emergency	<0.05%	3300 - 4150 ACFM	Regulatory Guide 1.52, Revision 2, March 1978, C.5.a, C.5.c, C.5.d (using ANSI N510-1980)
Spent Fuel Building	≤1%	11,070-13530 CFM	ANSI N510-1975
Containment Purge	≤1%	31,500-38500 CFM	ANSI N510-1975

ITS Insert 5.5.11-1 (Ventilation Filter Testing Program (VFTP))

5.5.11 (b):

ESF Ventilation System	Penetration /Bypass	Flowrate	Reference Std
Control Room Emergency	<0.05%	3300 - 4150 ACFM	Regulatory Guide 1.52, Revision 2, March 1978, C.5.a, C.5.c, C.5.d (using ANSI N510-1980)
Spent Fuel Building	≤1%	11070- 13530 CFM	ANSI N510-1975
Containment Purge	≤1%	31500- 38500 CFM	ANSI N510-1975

5.5.11 (c):

ESF Filter System	Penetration	Reference Std
Control Room Emergency	<1%	Regulatory Guide 1.52, Revision 2, March 1978, C.6.a, C.6.b (using ANSI N510-1980)
Spent Fuel Building	≤10%	ANSI/ASME N509-1976, Table 5-1, Test 5.b
Containment Purge	≤10%	ANSI/ASME N509-1976, Table 5-1, Test 5.b

The representative sample from the Control Room Emergency Filtration System shall be tested at a temperature ≤ 30°C.

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5.5 Programs and Manuals

(1)

5.5.11 Ventilation Filter Testing Program (VFTP) (continued)

[3.8.2.a]
[4.15.d.1]

b. Demonstrate for each of the ESF (the specified) systems that an inplace test of the charcoal adsorber shows a penetration and system bypass (leakage) < [0.05]% when tested in accordance with Regulatory Guide 1.52, Revision 2, and ASME N510-1989 (the referenced standard) at the system flowrate specified below [± 10%].

ESF Ventilation System	Flowrate
[ ]	[ ]

INSERT 5.5.11-1(b)

[3.8.2.b]
[4.15.e]

c. Demonstrate for each of the ESF systems that a laboratory test of a sample of the charcoal adsorber, when obtained as described in [Regulatory Guide 1.52, Revision 2] (in accordance with the referenced standard), shows the methyl iodide penetration less than the value specified below when tested in accordance with ASTM D3803-[1989] (1986) at a temperature of ≤ [30°C] and greater than or equal to the relative humidity specified below (of ≥ 70%).

ESF Ventilation System	Penetration	RH
[ ]	[ ]	[ ]

INSERT 5.5.11-1(c)

[Reviewer's Note: Allowable penetration = [100% - methyl iodide efficiency for charcoal credited in staff safety evaluation]/(safety factor)

Safety factor = [5] for systems with heaters.
= [7] for systems without heaters.]

[4.12.1]
[4.15.f.1]

d. Demonstrate for each of the ESF systems that the pressure drop across the combined HEPA filters, the prefilters, and the charcoal adsorbers is less than the value specified below when tested in accordance with Regulatory Guide 1.52

(continued)

CTS

5.5 Programs and Manuals

(1)

5.5.11 Ventilation Filter Testing Program (VFTP) (continued)

Revision 2, and ASME N510-1989] at the system flowrate specified below [± 10%].

INSERT 5.5.11-1(d)

ESF Ventilation System	Delta P	Flowrate
[ ]	[ ]	[ ]

[3.8.2.d]

e. Demonstrate that the heaters for each of the ESF systems dissipate the value specified below [± 10%] when tested in accordance with [ASME N510-1989].

1975

the Spent Fuel Building ventilation filter

maintains the filter inlet air at ≤70% relative humidity

(25)

ESF Ventilation System	Wattage
[ ]	[ ]

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the VFTP test frequencies.

[A33] 5.5.12 Explosive Gas and Storage Tank Radioactivity Monitoring Program

This program provides controls for potentially explosive gas mixtures contained in the [Waste Gas Holdup System], [the quantity of radioactivity contained in gas storage tanks or fed into the offgas treatment system], and the quantity of radioactivity contained in unprotected outdoor liquid storage tanks. The gaseous radioactivity quantities shall be determined following the methodology in [Branch Technical Position (BTP) ETSB 11-5, "Postulated Radioactive Release due to Waste Gas System Leak or Failure"]. The liquid radwaste quantities shall be determined in accordance with [Standard Review Plan, Section 15.7.3, "Postulated Radioactive Release due to Tank Failures"].

Waste Gas Decay Tanks

(14)

The program shall include:

a. The limits for concentrations of hydrogen and oxygen in the [Waste Gas Holdup System] and a surveillance program to ensure the limits are maintained. Such limits shall be

Decay Tanks

(continued)

5.5 Programs and Manuals

[A33] 5.5.12 Explosive Gas and Storage Tank Radioactivity Monitoring Program (Continued)

appropriate to the system's design criteria (i.e., whether or not the system is designed to withstand a hydrogen explosion);

b. A surveillance program to ensure that the quantity of radioactivity contained in each gas storage tank and fed into the offgas treatment system is less than the amount that would result in a whole body exposure of ≥ 0.5 rem to any individual in an unrestricted area, in the event of an uncontrolled release of the tanks' contents; and

c. A surveillance program to ensure that the quantity of radioactivity contained in all outdoor liquid radwaste tanks that are not surrounded by liners, dikes, or walls, capable of holding the tanks' contents and that do not have tank overflows and surrounding area drains connected to the Liquid Radwaste Treatment System is less than the amount that would result in concentrations less than the limits of 10 CFR 20, Appendix B, Table 2, Column 2, at the nearest potable water supply and the nearest surface water supply in an unrestricted area, in the event of an uncontrolled release of the tanks' contents.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Explosive Gas and Storage Tank Radioactivity Monitoring Program surveillance frequencies.

(1) each Waste Gas Decay Tank; Waste Disposal (a); that is 10 times the concentration values in; to 10 CFR 20.1001–20.2401 (10)

[M15] 5.5.13 Diesel Fuel Oil Testing Program

A diesel fuel oil testing program to implement required testing of both new fuel oil and stored fuel oil shall be established. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards. The purpose of the program is to establish the following:

a. Acceptability of new fuel oil for use prior to addition to storage tanks by determining that the fuel oil has:

1. an API gravity or an absolute specific gravity within limits,

ing (9) (29) (15) Not become contaminated with other products during transit, thus altering the quality of the fuel oil

(continued)

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The testing methods shall be in accordance with applicable ASTM Standards. The acceptance criteria shall be in accordance with the diesel engine manufacture's specifications. (15)

CTS

5.5 Programs and Manuals

(1)

5.5.13 Diesel Fuel Oil Testing Program (continued)

2. a flash point and kinematic viscosity within limits for ASTM 2D fuel oil, and

3. a clear and bright appearance with proper color;

b. Other properties for ASTM 2D fuel oil are within limits within 31 days following sampling and addition to storage tanks; and

c. Total particulate concentration of the fuel oil is ≤ 10 mg/l when tested every 31 days in accordance with ASTM D-2276, Method A-2 or A-3.

(15)

Acceptability of fuel oil for use by testing the following parameters at a 31 day frequency: API or specific gravity, viscosity, water and sediment, and clone exists

[M6]

5.5.14 Technical Specifications (TS) Bases Control Program

This program provides a means controls for processing changes to the Bases of these Technical Specifications.

(9)

a. Changes to the Bases of the TS shall be made under appropriate administrative controls and reviews.

b. Licensees may make changes to Bases without prior NRC approval provided the changes do not involve either of the following:

1. a change in the TS incorporated in the license; or

2. a change to the updated FSAR or Bases that involves an unreviewed safety question as defined in 10 CFR 50.59.

c. The Bases Control Program shall contain provisions to ensure that the Bases are maintained consistent with the FSAR UFSAR.

d. Proposed changes that meet the criteria of Specification 5.5.14b above shall be reviewed and approved by the NRC prior to implementation. Changes to the Bases implemented without prior NRC approval shall be provided to the NRC on a frequency consistent with 10 CFR 50.71(e).

(21)

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Diesel Fuel Oil Testing Program surveillance frequencies

(continued)

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CTS

5.6 Reporting Requirements (continued) (1)

[6.9.1.4] [6.9.1.2.4] 5.6.4 Monthly Operating Reports

Routine reports of operating statistics and shutdown experience*, including documentation of all challenges to the pressurizer power operated relief valves or pressurizer safety valves*, shall be submitted on a monthly basis no later than the 15th of each month following the calendar month covered by the report.

[6.9.3.3] 5.6.5 CORE OPERATING LIMITS REPORT (COLR)

[6.9.3.3.a] a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:

INSERT 5.6.5-1 → [The individual specifications that address core operating limits must be referenced here.]

[6.9.3.3.b] b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents: (27)

The approved revision number shall be identified in the COLR. These methods are those

[Identify the Topical Report(s) by number, title, date, and NRC staff approval document, or identify the staff Safety Evaluation Report for a plant specific methodology by NRC letter and date.]

INSERT 5.6.5-2

[6.9.3.3.c] c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.

[6.9.3.3.d] d. The COLR, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

5.6.6 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (RTLR) (18)

a. RCS pressure and temperature limits for heat up, cooldown, low temperature operation, criticality, and hydrostatic

(continued)

CTS

5.6 Reporting Requirements

(1)

5.6.6 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR) (continued)

6. The minimum temperature requirements of Appendix G to 10 CFR Part 50 shall be incorporated into the pressure and temperature limit curves.

7. Licensees who have removed two or more capsules should compare for each surveillance material the measured increase in reference temperature (RT_{NDT}) to the predicted increase in RT_{NDT}; where the predicted increase in RT_{NDT} is based on the mean shift in RT_{NDT} plus the two standard deviation value ($2\sigma_{\Delta}$) specified in Regulatory Guide 1.99, Revision 2. If the measured value exceeds the predicted value (increase RT_{NDT} + $2\sigma_{\Delta}$), the licensee should provide a supplement to the PTLR to demonstrate how the results affect the approved methodology.

(18)

5.6.7 EDG Failure Report

If an individual emergency diesel generator (EDG) experiences four or more valid failures in the last 25 demands, these failures and any nonvalid failures experienced by that EDG in that time period shall be reported within 30 days. Reports on EDG failures shall include the information recommended in Regulatory Guide 1.9, Revision 3, Regulatory Position C.5, or existing Regulatory Guide 1.108 reporting requirement.

(19)

Table 3.5-5 Notes

5.6.8 6 Post Accident Monitoring (PAM) Report Instrumentation

(20)

When a report is required by Condition B or G H of LCO 3.3.3 "Post Accident Monitoring (PAM) Instrumentation," a report shall be submitted within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status.

(continued)

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CTS 5.6 Reporting Requirements (continued) ①

[4.4.4.3.c] 5.6.9 7 **Tendon Surveillance Report**

INSERT 5.6-7

Any abnormal degradation of the containment structure detected during the tests required by the Pre-stressed Concrete Containment Tendon Surveillance Program shall be reported to the NRC within 30 days. The report shall include a description of the tendon condition, the condition of the concrete (especially at tendon anchorages), the inspection procedures, the tolerances on cracking, and the corrective action taken. (28)

[4.2.1.3] 5.6.10 8 **Steam Generator Tube Inspector Report**

INSERT 5.6-8

Reviewer's Note: Reports required by the Licensee's current licensing basis regarding steam generator tube surveillance requirements shall be included here. An appropriate administrative controls format should be used.

Reviewer's Note: These reports may be required covering inspection, test, and maintenance activities. These reports are determined on an individual basis for each unit and their preparation and submittal are designated in the Technical Specifications.

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ITS Insert 5.6.7-1 (Tendon Surveillance Report)

5.6.7 Tendon Surveillance Report

a. Notification of a pending sample tendon test, along with detailed acceptance criteria, shall be submitted to the NRC at least two months prior to the actual test.

b. A report containing the sample tendon test evaluation shall be submitted to the NRC within six months of conducting the test.

5.6.8 Steam Generator Tube Inspection Report

a. A report of the number of tubes plugged in each steam generator shall be submitted to the NRC within 14 days after completion of the tube plugging.

b. A report of the results of the steam generator tube inspection shall be included in the Monthly Operating Report for the period beginning after the final inspection is completed.

Reports shall include:

1. Number and extent of tubes inspected
2. Location and percent of wall thickness penetration for each eddy current indication and any leaks.
3. Identification of tubes plugged.

c. A report of examination results falling in Category C-3 of Table 5.5-1 shall be submitted to the NRC within 30 days, and prior to resumption of plant operation.

A report of investigations conducted to determine cause(s) of the tube degradation and corrective measures taken to prevent recurrence shall be submitted within 90 days following completion of the startup test program.

ITS Insert 5.7.1-1 (High Radiation Area)

CTS

[6.13.1] 5.7.1 In lieu of the "control device" or "alarm signal" required by paragraph 20.1601(a) of 10 CFR 20, each High Radiation Area in which the intensity of radiation is 1000 mRem/hour or less shall be barricaded and conspicuously posted by requiring issuance of a Radiation Work Permit (RWP).

[6.13.1 *] Radiation control personnel or personnel escorted by radiation control personnel shall be exempt from the RWP issuance requirements during the performance of their assigned duties within the RCA, provided they comply with approved radiation protection procedures for entry into High Radiation Areas. (30)

1 In the conversion of the HBRSEP current Technical Specifications (CTS) to the proposed plant specific Improved Technical Specifications (ITS), certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes which involve the insertion of plant specific terms or parameters are used to preserve consistency with the CTS and licensing basis. Such changes are considered to be administrative, as neither technical content nor overall intent has been altered, and therefore have no impact on safety.

2 Specification presentation is modified for clarity, or to correct a typographical or grammatical error.

3 ISTS Specification 5.1.2 is modified to substitute plant specific terminology regarding the shift position responsible for the control room command function.

4 HBRSEP is a single unit site. Information related to dual unit sites is either deleted or modified to reflect a single unit.

5 ISTS Specification 5.2.2.g, related to the shift technical advisor (STA) position, is modified in the ITS to reflect the current licensing basis regarding the function of the position. Qualification requirements are identified in ITS Specification 5.3, "Unit Staff Qualifications." The modified text assures that the STA provides advisory technical support to the shift superintendent.

6 ISTS Specification 5.3, "Unit Staff Qualifications," is modified in the ITS to reflect that the manager of the radiation protection function meet or exceed the minimum qualifications of ANSI/ANS 3.1-1981. ANSI/ANS 3.1-1981 reflects the currently acceptable qualification requirements for nuclear power plant personnel, and is updated as deemed necessary, based on operating experience and lessons learned throughout the commercial nuclear industry. The qualification requirements for the STA are also added, consistent with current licensing basis. The requirements for the STA were reviewed and approved by the NRC as License Amendment No. 59 on 8/24/81. The qualifications of other unit staff personnel are retained consistent with the current licensing basis.

7 ISTS Specification 5.4.1.b is modified in the ITS by replacing the term, "requirements of," with "commitments to," to be more specific with regard to NUREG-0737, since not all the NUREG requirements have been committed to by HBRSEP.

8 ISTS Specifications 5.5.1, "Offsite Dose Calculation Manual," and 5.5.15, "Safety Function Determination Program," are renumbered in the ITS to maintain consistency with the Writer's Guide for the Restructured Technical Specifications.

9 The text presentation in ISTS Specifications 5.5.3, "Post Accident Sampling," 5.5.7, "Reactor Coolant Pump Flywheel Inspection Program," 5.5.11, "Ventilation Filter Testing Program," 5.5.13, "Diesel Fuel Oil Testing Program," 5.5.14, "Technical Specifications (TS) Bases Control Program, and 5.5.15, "Safety Function Determination Program (SFDP)," is modified in the ITS to be consistent with the presentation of purpose statements of other programs in this Chapter.

10 ISTS Specifications 5.5.4, "Radioactive Effluent Controls Program," 5.5.12, "Explosive Gas and Storage Tank Radioactivity Monitoring Program," and 5.6.1, "Occupational Radiation Exposure Report," are revised in the ITS to be consistent with the new 10 CFR 20 requirements.

11 ISTS Specification 5.5.4.f requires limitations on the functional capability and use of the liquid and gaseous effluent treatment systems to ensure that appropriate portions of these systems are used to reduce releases of radioactivity when the projected doses in a period of 31 days would exceed 2% of the guidelines for the annual dose or dose commitment, conforming to 10 CFR 50, Appendix I. However, CTS Specifications 3.16.1 and 3.16.3 require that the Liquid Radwaste Treatment System and Gaseous Radwaste Treatment System, respectively, be maintained and used whenever the projected dose commitments exceed specified quarterly limits. Therefore, to maintain the current licensing basis, ISTS Specification 5.5.4.f is modified in the ITS to replace the reference to 2% of the guidelines or dose commitment over 31 days with a reference to ". . . projected dose commitments due to the release of effluents to unrestricted areas exceeding specified limits conforming to 10 CFR 50 Appendix I." These limits are those specified in CTS 3.16.1 and 3.16.3. These specifications are relocated to the ODCM. (DOC R1 in the "Relocated Specification" section of the conversion package provides additional information regarding the relocation of these specifications.) These limits are in conformance with the design dose objectives specified in Appendix I of 10 CFR 50 for liquid and gaseous effluents and were reviewed and approved by NRC by issuance of Amendment No. 85 dated 11/14/84.

12 ISTS Specification 5.5.7, "Reactor Coolant Pump Flywheel Inspection Program," is modified in the ITS to be consistent with current licensing basis, which includes visual and ultrasonic inspections conducted in accordance with the Inservice Inspection Program. This reflects the CLB for HBRSEP Unit No. 2. HBRSEP Unit No. 2 is not committed to Regulatory Guide 1.14.

13 ISTS Specification 5.5.8, "Inservice Testing (IST) Program," is modified in the ITS to state that the IST Program provides control for ASME Code Class 1, 2, and 3 "pumps and valves," in place of "components including applicable supports." 10 CFR 50.55a(f) provides the regulatory requirements for an IST Program, and specifies that ASME Code Class 1, 2, and 3 pumps and valves are the only components covered by an IST

Program. 10 CFR 50.55a(g) provides regulatory requirements for an Inservice Inspection (ISI) Program, and specifies that ASME Code Class 1, 2, and 3 components (including supports) are covered by the ISI Program, and that pumps and valves are covered by the IST Program in 10 CFR 50.55a(f). The ISTS does not include ISI Program requirements, as these program requirements have been relocated to plant specific documents. Therefore, the "applicable support" requirements are deleted and the components the IST Program applies to (i.e., pumps and valves) are added for clarity. Additionally, the statement, "The Program shall include the following:" is deleted since not all the statements that follow are really part of the program requirements.

14 ISTS Specification 5.5.12, "Explosive Gas and Storage Tank Radioactivity Monitoring Program," contains statements that specify the methodologies to be used for determining quantities of radioactivity present in waste gas decay tanks and liquid radwaste holdup tanks, which are not adopted in the ITS. The limits in CTS 3.16.2 and CTS 3.16.5 are relocated to the TRM. These limits on quantities have been previously reviewed and approved by the NRC in Amendment No. 85 dated 11/14/84. A summary analysis of gaseous and liquid treatment system failures is presented in UFSAR Sections 15.7.1 and 15.7.2. This information was taken from the original licensing basis (i.e., the Final Facility Description and Safety Analysis Report, utilized by the AEC in issuing a Facility Operating License on July 31, 1970.

15 ISTS Specification 5.5.13, "Diesel Fuel Oil Testing Program," is revised to be consistent with the HBRSEP current practice and Current Licensing Basis (CLB). The acceptability of new fuel oil is verified by the use of a certificate of compliance provided by the diesel fuel oil supplier for each new fuel oil delivery. The certificate of compliance includes certification of each of the new fuel oil properties included in ISTS 5.5.13.a. Therefore to maintain consistency with this current practice, ISTS 5.5.13.a is revised to state "Acceptability of new fuel oil for use prior to addition to the storage tanks by determining that the new oil has not become contaminated with other products during transit, thus altering the quality of the fuel oil." This will ensure the new fuel oil is maintained consistent with that identified in the certificate of compliance. In addition, the ISTS 5.5.13.b requirements for stored fuel oil are revised to reflect the HBRSEP CLB. The CLB regarding fuel oil testing was reviewed and approved by the NRC by issuance of Amendment No. 124 dated 10/26/89. The current licensing basis with regard to fuel oil testing acceptance criteria "in accordance with diesel engine manufacurer's specifications" was previously accepted by the NRC in letter from S. A. Varga (NRC) to J. A. Jones (CP&L) dated December 10, 1981. Plant operation has demonstrated that the combination of the current plant practice and CLB are adequate for maintaining the quality of the diesel fuel oil.

16 ISTS Specification 5.6.1, "Occupational Radiation Exposure Report," is modified in the ITS to simplify the presentation of examples of work and job functions. The examples, "routine maintenance, special maintenance [describe maintenance]," are replaced with "maintenance," to be consistent with other examples given.

17 ISTS Specification 5.6.2, "Annual Radiological Environmental Operating Report," is modified in the ITS by replacing the phrase, "the table," with "Table 3," to more clearly identify which table in the Radiological Assessment Branch Technical Position is referenced.

18 ISTS Specification 5.6.6, "Reactor Coolant System (RCS) Pressure and Temperature Limits Report (PTLR)," is not adopted in the ITS. CTS Figures 3.1-1 and 3.1-2, which provide Reactor Coolant System heatup and cooldown limitations, respectively, were updated from 15 to 24 EFPY in 1994, and are adopted in ITS Specification 3.4.3, "RCS Pressure and Temperature (P/T) Limits." Subsequent Specifications are renumbered accordingly.

19 ISTS Specification 5.6.7, "EDG Failure Report," is not adopted in the ITS, consistent with current licensing basis and with the guidance provided in Generic Letter 94-01. Subsequent Specifications are renumbered accordingly. Requirements of 10 CFR 50.65 (Maintenance Rule) are implemented at HBRSEP for required systems including the Diesel Generators. Additionally Amendment 174 involving changes to DG testing requirements was approved on 9/11/96 without imposing the subject reporting requirements.

20 ISTS Specification 5.6.8, "PAM Report," is modified in the ITS to define the acronym "PAM," to be consistent with the format of the ITS, since it is the first use of the term in these Specifications. The term "Instrumentation" is also added for clarity.

21 ISTS Specification 5.5.13, "Diesel Fuel Oil Testing Program," is revised to add provision for applicability of SRs 3.0.2 and 3.0.3. The current licensing basis for the surveillance frequencies for the Diesel Fuel Oil Testing Program includes provision for the surveillance extensions contained in SR 3.0.2 and SR 3.0.3.

22 ISTS Specification 5.5, "Program and Manuals," is modified to add Specification 5.5.16, "Containment Leakage Testing Program," which was added in Amendment 163 in conformance with 10 CFR 50, Appendix J, Option B.

23 ISTS Specification 5.5.3 is modified to require the capability to obtain and analyze radioactive iodines in lieu of radioactive gases. This wording is consistent with Condition 3.G.4 to the HBRSEP Unit No. 2 facility operating license. As such this change to ISTS wording is necessary to reflect the current licensing basis requirements for Post Accident Sampling. This License Condition was reviewed and approved by NRC by issuance of Amendment No. 99, dated 8/29/1985.

24 ISTS 5.5.6 is modified to change the Pre-Stressed Concrete Containment Tendon Surveillance Program contents to reflect the Current Licensing Basis (CLB) for containment tendon surveillance testing. The CLB for the Containment Pre-Stressed Concrete Tendon Surveillance Program does not include any requirements for baseline measurements prior to initial unit operation and does not conform to Regulatory Guide 1.35. The HBRSEP Unit No. 2 Pre-Stressed Concrete Containment Tendon Surveillance

Program is plant specific since the development and approval of the associated requirements preceded development of contemporary standards.

25 ISTS 5.5.11 requirements for demonstrating filter heater output is modified to reflect the current licensing basis (CTS 3.8.2.d). Although the Spent Fuel Building Ventilation System includes a heater to remove moisture from the air stream prior to entry into the filter. Its use is not necessarily required. The modified requirement ensures filter inlet air is < 70% relative humidity which ensure proper filtration capability. If this requirement cannot be met, the Spent Fuel Building Filtration System is considered inoperable and associated fuel handling operation must be terminated. This requirement must be met whether or not the heater is functioning properly. Therefore, it is unnecessary to require demonstrating heater function. CTS 3.8.2.d was reviewed and approved by the AEC (predecessor to NRC) by issuance of Amendment No. 5 dated 5/15/74.

26 ISTS Specification 5.2.1.a concerning documentation of the organizational structures is revised to reflect the current licensing basis (CTS 6.2.1.a) for this requirement. The current licensing basis was reviewed and approved by the NRC by issuance of Amendment No. 120 on 11/3/88.

27 ITS does not adopt a listing of associated NRC safety evaluation reports as suggested in the bracketed ISTS information. The Non-adoption of the listing of associated NRC safety evaluation reports is consistent with the current licensing basis for HBRSEP Unit No. 2. Revising the Technical Specifications to identify revisions to methodologies and a reference to NRC approval of a revision imposes a significant administrative burden upon both CP&L and NRC. Technical Specification Amendment No. 154, dated 12/12/94 provided for specifying comparable information (Revision No. for the NRC approved revision) in the COLR. This approach is retained in the ITS and provides an acceptable level of control.

28 ISTS 5.6.9 requires reporting within 30 days after discovery of abnormal degradation detected during the tests required by the Pre-Stressed Concrete Containment Tendon Surveillance Program. Other reporting requirements specified in 10 CFR 50.72 and 50.73 may also be applicable in this circumstance. The ISTS bracketed Tendon Surveillance Report is modified in the ITS to be consistent with the current licensing basis for tendon test reporting requirement as specified in CTS 4.4.4.3.c. This requires reporting within 6 months regardless whether abnormal degradation is found.

29 ISTS 5.5.13, Diesel Fuel Oil Testing Program, is modified to delete the reference to ASTM Standards. The design of the HBRSEP fuel oil storage tanks do not readily support sampling the fuel oil using ASTM techniques. This is consistent with the current licensing basis since there are no CTS requirements for meeting the ASTM sampling techniques for sampling the tanks.

30 ITS Specification 5.2.1.d, ITS Specification 5.2.2.e, and ITS Specification 5.7.1 are modified to reflect the generic title of

"radiation control" individuals. This change is being made to be consistent with the generic title in the HBRSEP Unit No. 2 UFSAR. Per UFSAR Section 12.1, "radiation control" individuals implement health physics programs and principles.

5.0 ADMINISTRATIVE CONTROLS

5.1 Responsibility

5.1.1 The Plant Manager shall be responsible for overall unit operation and shall delegate in writing the succession to this responsibility during his absence.

The Plant Manager or his designee shall approve, prior to implementation, each proposed test, experiment or modification to systems and equipment that affect nuclear safety.

5.1.2 The Superintendant-Shift Operations (SSO) shall be responsible for the control room command function. During any absence of the SSO from the control room while the unit is in MODE 1, 2, 3, or 4, an individual with an active Senior Reactor Operator (SRO) license shall be designated to assume the control room command function. During any absence of the SSO from the control room while the unit is in MODE 5 or 6, an individual with an active SRO license or Reactor Operator license shall be designated to assume the control room command function.

5.2 Organization

5.2.2 Unit Staff (continued)

2. An individual should not be permitted to work more than 16 hours in any 24 hour period, nor more than 24 hours in any 48 hour period, nor more than 72 hours in any 7 day period, all excluding shift turnover time;

3. A break of at least 8 hours should be allowed between work periods, including shift turnover time;

4. Except during extended shutdown periods, the use of overtime should be considered on an individual basis and not for the entire staff on a shift.

Any deviation from the above guidelines shall be authorized in advance by the Plant Manager or his designee, in accordance with approved administrative procedures, or by higher levels of management, in accordance with established procedures and with documentation of the basis for granting the deviation.

Controls shall be included in the procedures such that individual overtime shall be reviewed monthly by the Plant Manager or his designee to ensure that excessive hours have not been assigned. Routine deviation from the above guidelines is not authorized.

f. The Operations Manager or Superintendent in charge of the operations shift crews shall hold an SRO license.

g. During MODES 1, 2, 3, and 4, the shift technical advisor (STA) shall provide advisory technical support to the SSO with regard to the safe operation of the unit. If an individual that holds an SRO license also meets the STA requirements, that individual may act in both capacities.

5.5 Programs and Manuals (continued)

5.5.11 Ventilation Filter Testing Program (VFTP)

This program provides controls for implementation of the following required testing of Engineered Safety Feature (ESF) ventilation filter systems at the frequencies specified in Positions C.5 and C.6 of Regulatory Guide 1.52, Revision 2, March 1978, and conducted in general conformance with ANSI N510-1975 or N510-1980.

a. Demonstrate for each of the ESF systems that an inplace test of the high efficiency particulate air (HEPA) filters shows the specified penetration and system bypass leakage when tested in accordance with the referenced standard at the system flowrate specified below.

ESF Ventilation System	Penetration /Bypass	Flowrate	Reference Std
Control Room Emergency	<0.05%	3300 - 4150 ACFM	Regulatory Guide 1.52, Revision 2, March 1978, C.5.a, C.5.c, C.5.d (using ANSI N510-1980)
Spent Fuel Building	≤1%	11070- 13530 CFM	ANSI N510-1975
Containment Purge	≤1%	31500- 38500 CFM	ANSI N510-1975

(continued)

5.5 Programs and Manuals

5.5.11 Ventilation Filter Testing Program (VFTP) (continued)

b. Demonstrate for each of the ESF systems that an inplace test of the charcoal adsorber shows the specified penetration and system bypass leakage when tested in accordance with the referenced standard at the system flowrate specified below.

ESF Ventilation System	Penetration /Bypass	Flowrate	Reference Std
Control Room Emergency	<0.05%	3300 - 4150 ACFM	Regulatory Guide 1.52, Revision 2, March 1978, C.5.a, C.5.c, C.5.d (using ANSI N510-1980)
Spent Fuel Building	≤1%	11070- 13530 CFM	ANSI N510-1975
Containment Purge	≤1%	31500- 38500 CFM	ANSI N510-1975

(continued)

5.5 Programs and Manuals

5.5.11 Ventilation Filter Testing Program (VFTP) (continued)

c. Demonstrate for each of the ESF systems that a laboratory test of a sample of the charcoal adsorber, when obtained in accordance with the referenced standard, shows the methyl iodide penetration less than the value specified below when tested in accordance with ASTM D3803-1986 at a relative humidity of ≥ 70%.

ESF Filter System	Penetration	Reference Std
Control Room Emergency	<1%	Regulatory Guide 1.52, Revision 2, March 1978, C.6.a, C.6.b (using ANSI N510-1980)
Spent Fuel Building	≤10%	ANSI/ASME N509-1976, Table 5-1, Test 5.b
Containment Purge	≤10%	ANSI/ASME N509-1976, Table 5-1, Test 5.b

The representative sample from the Control Room Emergency Filtration System shall be tested at a temperature ≤ 30°C.

(continued)

5.5 Programs and Manuals

5.5.11 Ventilation Filter Testing Program (VFTP) (continued)

d. Demonstrate for each of the ESF systems that the pressure drop across the combined HEPA filters, and the charcoal adsorbers is less than the value specified below when tested at the system flowrate specified below.

ESF Filter System	Delta P	Flowrate
Control Room Emergency	≤3.4 inches water gauge	3300 - 4150 ACFM
Spent Fuel Building	<6 inches water gauge	12300 CFM ±10%
Containment Purge	<6 inches water gauge	35000 CFM ±10%

e. Demonstrate that the heaters for the Spent Fuel Building ventilation filter system maintains the filter inlet air at ≤ 70% relative humidity when tested in accordance with ASME N510-1975.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the VFTP test frequencies.

5.5.12 Explosive Gas and Storage Tank Radioactivity Monitoring Program

This program provides controls for potentially explosive gas mixtures contained in the Waste Gas Decay Tanks, the quantity of radioactivity contained in The Waste Gas Decay Tanks and the quantity of radioactivity contained in unprotected outdoor liquid storage tanks.

The program shall include:

a. The limits for concentrations of hydrogen and oxygen in the Waste Gas Decay Tanks and a surveillance program to ensure the limits are maintained. Such limits shall be appropriate

(continued)

5.5 Programs and Manuals

5.5.12 Explosive Gas and Storage Tank Radioactivity Monitoring Program (continued)

to the system's design criteria (i.e., whether or not the system is designed to withstand a hydrogen explosion);

b. A surveillance program to ensure that the quantity of radioactivity contained in each Waste Gas Decay Tank is less than the amount that would result in a whole body exposure of ≥ 0.5 rem to any individual in an unrestricted area, in the event of an uncontrolled release of the tanks' contents; and

c. A surveillance program to ensure that the quantity of radioactivity contained in all outdoor liquid radwaste tanks that are not surrounded by liners, dikes, or walls, capable of holding the tanks' contents and that do not have tank overflows and surrounding area drains connected to the Liquid Waste Disposal System is less than the amount that would result in a concentration that is 10 times the concentration values in Appendix B, Table 2, Column 2 to 10 CFR 20.1001-20.2401, at the nearest potable water supply and the nearest surface water supply in an unrestricted area, in the event of an uncontrolled release of the tanks' contents.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Explosive Gas and Storage Tank Radioactivity Monitoring Program surveillance frequencies.

5.5.13 Diesel Fuel Oil Testing Program

A diesel fuel oil testing program shall be established requiring testing of both new fuel oil and stored fuel oil. The program shall include sampling and testing requirements, and acceptance criteria. The testing methods shall be in accordance with applicable ASTM Standards. The acceptance criteria shall be in accordance with the diesel engine manufacturer specifications. The purpose of the program is to establish the following:

a. Acceptability of new fuel oil for use prior to addition to storage tanks by determining that the fuel oil has not become contaminated with other products during transit, thus altering the quality of the fuel oil.

(continued)

5.5 Programs and Manuals

5.5.13 Diesel Fuel Oil Testing Program (continued)

b. Acceptability of fuel oil for use by testing the following parameters at a 31 day frequency:

API or specific gravity, viscosity, water and sediment, and cloud point.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Diesel Fuel Oil Testing Program surveillance frequencies.

5.5.14 Technical Specifications (TS) Bases Control Program

This program provides controls for processing changes to the Bases of these Technical Specifications.

a. Changes to the Bases of the TS shall be made under appropriate administrative controls and reviews.

b. Licensees may make changes to Bases without prior NRC approval provided the changes do not involve either of the following:

   1. a change in the TS incorporated in the license; or

   2. a change to the updated FSAR or Bases that involves an unreviewed safety question as defined in 10 CFR 50.59.

c. The Bases Control Program shall contain provisions to ensure that the Bases are maintained consistent with the UFSAR.

d. Proposed changes that meet the criteria of Specification 5.5.14b above shall be reviewed and approved by the NRC prior to implementation. Changes to the Bases implemented without prior NRC approval shall be provided to the NRC on a frequency consistent with 10 CFR 50.71(e).

5.5.15 Safety Function Determination Program (SFDP)

This program provides controls to ensure loss of safety function is detected and appropriate actions taken. Upon entry into LCO 3.0.6, an evaluation shall be made to determine if loss of safety function exists. Additionally, other appropriate actions may be

(continued)

5.5 Programs and Manuals

5.5.15 Safety Function Determination Program (SFDP) (continued)

taken as a result of the support system inoperability and corresponding exception to entering supported system Condition and Required Actions. This program implements the requirements of LCO 3.0.6.

a. The SFDP shall contain the following:

   1. Provisions for cross train checks to ensure a loss of the capability to perform the safety function assumed in the accident analysis does not go undetected;

   2. Provisions for ensuring the plant is maintained in a safe condition if a loss of function condition exists;

   3. Provisions to ensure that an inoperable supported system's Completion Time is not inappropriately extended as a result of multiple support system inoperabilities; and

   4. Other appropriate limitations and remedial or compensatory actions.

b. A loss of safety function exists when, assuming no concurrent single failure, a safety function assumed in the accident analysis cannot be performed. For the purpose of this program, a loss of safety function may exist when a support system is inoperable, and:

   1. A required system redundant to the system(s) supported by the inoperable support system is also inoperable; or

   2. A required system redundant to the system(s) in turn supported by the inoperable supported system is also inoperable; or

   3. A required system redundant to the support system(s) for the supported systems described in b.1 and b.2 above is also inoperable.

c. The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

(continued)

5.6 Reporting Requirements (continued)

5.6.8 Steam Generator Tube Inspection Report

a. A report of the number of tubes plugged in each steam generator shall be submitted to the NRC within 14 days after completion of the tube plugging.

b. A report of the results of the steam generator tube inspection shall be included in the Monthly Operating Report for the period beginning after the final inspection is completed.

Reports shall include:

1. Number and extent of tubes inspected
2. Location and percent of wall thickness penetration for each eddy current indication and any leaks.
3. Identification of tubes plugged.

c. A report of examination results falling in Category C-3 of Table 5.5-1 shall be submitted to the NRC within 30 days, and prior to resumption of plant operation.

A report of investigations conducted to determine cause(s) of the tube degradation and corrective measures taken to prevent recurrence shall be submitted within 90 days following completion of the startup test program.

5.0 ADMINISTRATIVE CONTROLS

5.7 High Radiation Area

5.7.1 In lieu of the “control device” or “alarm signal” required by paragraph 20.1601(a) of 10 CFR 20, each High Radiation Area in which the intensity of radiation is 1000 mRem/hour or less shall be barricaded and conspicuously posted by requiring issuance of a Radiation Work Permit (RWP).

Radiation control personnel or personnel escorted by radiation control personnel shall be exempt from the RWP issuance requirements during the performance of their assigned duties within the RCA, provided they comply with approved radiation protection procedures for entry into High Radiation Areas.

Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

a. A radiation monitoring device that continuously indicates the radiation dose rate in the area.

b. A radiation monitoring device provided for each individual that continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate levels in the area have been established and personnel are aware of them.

c. An individual qualified as a radiation control technician with a radiation dose rate monitoring device, who is responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the radiation control supervisor in the RWP.

(continued)

SUPPLEMENT 4
CONVERSION PACKAGE SECTION
PAGE INSERTION INSTRUCTIONS

Remove and insert the following pages into Enclosure 20 to Serial: RNP-RA/0141

Remove Page	Insert Page

a. Part 1, "Markup of Current Technical Specifications (CTS)"

4.1-9	4.1-9

b. Part 2, "Discussion of changes (DOCs) for CTS Markup"

1	1

c. Part 3, "No Significant Hazards Consideration (NSHC), And Basis for Categorical Exclusion from 10 CFR 5122"
NA

TABLE 4.1-1 (Continued)

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

	Channel Description	Check	Calibrate	Test	Remarks
	b. Main Vent Stack				
	High Range	D	R	Q	
	Mid Range	D	R	Q	
	c. Spent Fuel Pit Lower Level				
	High Range	D	R	Q	
39.	Steam/Feedwater Flow Mismatch	N.A.	R	M	
40.	Low Steam Generator Water Level	N.A.	R	M	
41.	CV Level (Wide Range)+	M	R	R	
42.	CV Pressure (Wide Range)++	M	R	R	
43.	CV Hydrogen Monitor+++	M	R	R	
44.	CV High Range Radiation Monitor++++	M	R#	R	
45.	RCS High Point Vents	N.A.	N.A.	R	
46.	Manual Reactor Trip	N.A.	N.A.	R(1)	(1) The manual reactor trip operational test shall verify the independent operability of the manual shunt trip circuit and the manual UV trip circuit on the reactor trip breakers. The test shall also verify the operability of the UV trip circuit on the bypass breakers.
47.	Reactor Trip Bypass Breakers	N.A.	N.A.	M(3),R(4)	(3) Remote manual UV trip required only when placing the bypass breaker in service. (4) Perform UV trip from protection system.

See ITS 3.3.1

R1

Relocated Specifications

ADMINISTRATIVE CHANGES

A1 In the conversion of the H.B. Robinson Steam Electric Plant (HBRSEP), Unit No.2 Current Technical Specification (CTS) to the proposed plant specific Improved Technical Specifications (ITS) certain wording preferences or conventions are adopted which do not result in technical changes (either actual or interpretational). Editorial changes, reformatting, and revised numbering are adopted to make ITS consistent with the conventions in the - Standard Technical Specifications, Westinghouse Plants NUREG-1431, Rev 1 (i.e., Improved Standard Technical Specifications (ISTS)).

A2 The CTS bases are not retained in the ITS, but are replaced in their entirety. The ITS includes significantly expanded and improved bases. The bases do not define or impose any specific requirements but serve to explain, clarify and document the reasons (i.e., bases) for the associated specification. The bases are not part of the Technical Specifications required by 10 CFR 50.36. Therefore, this is an administrative change and is consistent with ISTS.

TECHNICAL CHANGES - MORE RESTRICTIVE

None

TECHNICAL CHANGES - LESS RESTRICTIVE (GENERIC)

None

TECHNICAL CHANGES - LESS RESTRICTIVE (SPECIFIC)

None

RELOCATED SPECIFICATIONS

R1 The following specifications are relocated from the Technical Specifications:

3.1.1.4, Table 4.1-1 Item 45	Reactor Coolant System (RCS) Vent Path
3.1.6	Maximum Reactor Coolant Oxygen and Chloride Concentration
3.5.2, Table 3.5-6 4.19.1, Table 4.19-1	Radioactive Liquid Effluent Instrumentation
3.5.3, Table 3.5-7 4.19.2, Table 4.19-2	Radioactive Gaseous Effluent Instrumentation
3.8.3	Spent Fuel Pool Full Core Discharge Temperature Limitations
3.8.4	Spent Fuel Cask Handling Crane

Page Insertion Instruction for inserting pages into Enclosure 21 to Serial: RNP-RA/96-0141, "Compilation of CTS Pages."

Remove Page	Insert Page
1-2 (ITS 1.1)	1-2 (ITS 1.1)
1-3 (ITS 1.1	1-3 (ITS 1.1)
3.10-1 (ITS 3.1.7)	3.10-1 (ITS 3.1.7)
4.1-6 (ITS 3.1.7)	4.1-6 (ITS 3.1.7)
2.3-1 (ITS 3.3.1)	2.3-1 (ITS 3.3.1)
2.3-2 (ITS 3.3.1)	2.3-2 (ITS 3.3.1)
2.3-3 (ITS 3.3.1)	2.3-3 (ITS 3.3.1)
3.5-12 (ITS 3.3.1)	3.5-12 (ITS 3.3.1)
3.5-13b (ITS 3.31)	3.5-13b (ITS 3.3.1)
3.10-8 (ITS 3.3.1)	3.10-8 (ITS 3.3.1)
4.1-5 (ITS 3.3.1)	4.1-5 (ITS 3.3.1)
4.1-6 (ITS 3.3.1)	4.1-6 (ITS 3.3.1)
4.1-7 (ITS 3.3.1)	4.1-7 (ITS 3.3.1)
4.1-7a (ITS 3.3.1)	4.1-7a (ITS 3.3.1)
4.1-9 (ITS 3.3.1)	4.1-9 (ITS 3.3.1)
4.1-12 (ITS 3.3.2)	4.1-12 (ITS 3.3.2)
3.5-14 (ITS 3.3.2)	3.5-14 (ITS 3.3.2)
3.5-15a (ITS 3.3.2)	3.5-15a (ITS 3.3.2)
3.5-16 (ITS 3.3.2)	3.5-16 (ITS 3.3.2)
3.5-17 (ITS 3.3.2)	3.5-17 (ITS 3.3.2)
3.5-18 (ITS 3.3.3)	3.5-18 (ITS 3.3.3)
3.5-19a (ITS 3.3.3)	3.5-19a (ITS 3.3.3)
4.1-8 (ITS 3.3.3)	4.1-8 (ITS 3.3.3)
3.5-15a sheet 1 (ITS 3.3.5)	3.5-15a sheet 1 (ITS 3.3.5)
3.5-15a sheet 2 (ITS 3.3.5)	3.5-15a sheet 2 (ITS 3.3.5)
4.1-8 (ITS 3.3.5)	4.1-8 (ITS 3.3.5)
3.5-10 (ITS 3.3.5)	3.5-10 (ITS 3.3.5)
3.5-11 (ITS 3.3.5)	3.5-11 (ITS 3.3.5)
3.5-1 (ITS 3.3.6)	3.5-1 (ITS 3.3.6)
3.5-16 (ITS 3.3.6)	3.5-16 (ITS 3.3.6)
3.5-11 (ITS 3.3.6)	3.5-11 (ITS 3.3.6)
3.8-1 (ITS 3.3.6-3.3.7)	3.8-1 (ITS 3.3.6-3.3.7)
3.4-5 (ITS 3.3.8)	3.4-5 (ITS 3.3.8)
4.8-3 (ITS 3.3.8)	4.8-3 (ITS 3.3.8)
5.4-2 (ITS 4.3)	5.4-2 (ITS 4.3)
6.1-1 (ITS 5.1)	6.1-1 (ITS 5.1)
6.2-1 (ITS 5.2)	6.2-1 (ITS 5.2)
6.2-2 (ITS 5.2)	6.2-2 (ITS 5.2)
6.2-4 (ITS 5.2)	6.2-4 (ITS 5.2)

Page Insertion Instruction for inserting pages into Enclosure 21 to Serial: RNP-RA/96-0141, "Compilation of CTS Pages."

Remove Page	Insert Page
6.5-1 (ITS 5.4)	6.5-1 (ITS 5.4)
Final Operating License	-
Pages 4, 5, 4, 4 (ITS 5.5)	-
1-6 (ITS 5.5)	1-6 (ITS 5.5)
4.2-4 (ITS 5.5)	4.2-4 (ITS 5.5)
4.20-3 (ITS 5.5)	4.20-3 (ITS 5.5)
6.9-2 (ITS 5.6)	6.9-2 (ITS 5.6)
6.9-9 (ITS 5.6)	6.9-9 (ITS 5.6)
4.2-4 (ITS 5.6)	4.2-4 (ITS 5.6)
6.13-1 (ITS 5.7)	6.13-1 (ITS 5.7)
4.1-9 (Relocated Specifications)	4.1-9 (Relocated Specifications)
4.6-1 (ITS 3.8.1)	4.6-1 (ITS 3.8.1)
3.7-1 (ITS 3.8.3)	3.7-1 (ITS 3.8.3)
4.1-12 (ITS 3.8.3)	4.1-12 (ITS 3.8.3)
4.6-2 (ITS 3.8.6)	4.6-2 (ITS 3.8.6)
3.7-2 (ITS 3.8.9)	3.7-2 (ITS 3.8.9)
4.1-14 (ITS 3.8.9)	4.1-14 (ITS 3.8.9)

Chapter 1.1

CORE ALTERATION

A1

1.2.6 Refueling Operation

Fuel sources or reactivity control components within the reactor vessel

Any operation involving movement of core components when there is fuel in the containment vessel and the pressure vessel head is unbolted or removed.

Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position

1.2.7 Operating Basis Earthquake

The operating basis earthquake is that earthquake which involves a ground acceleration of 0.10 g horizontally and 0.067 g vertically.

1.2.8 Safe Shutdown Earthquake

The safe shutdown earthquake is that earthquake which involves a ground acceleration of 0.20 g horizontally and 0.133 g vertically.

A8

1.3 OPERABLE - OPERABILITY

A9

Safety

A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal and emergency electrical power sources, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component or device to perform its function(s) are also capable of performing their related support function(s).

and when

or

specified Safety

and

When a system, subsystem, train, component or device is determined to be inoperable solely because its emergency power source is inoperable, or solely because its normal power source is inoperable, it may be considered OPERABLE for the purpose of satisfying the requirements of its applicable Limiting Condition for operation, provided: (1) its corresponding normal or emergency power source is OPERABLE; and (2) all of its redundant system(s), subsystem(s), train(s), component(s) and device(s) are OPERABLE, or likewise satisfy the requirements of this specification.

See 3.8

1.4 PROTECTION INSTRUMENTATION CHANNEL

An arrangement of components and modules are required to generate a single protective action signal when required by a plant condition. A channel loses its identity where single action signals are combined.

1.5 DEGREE OF REDUNDANCY

The difference between the number of operable channels and the number of channels which when tripped will cause an automatic system trip.

A8

Add TABLE 1.1-1 MODE 6 - Refueling

M2

A1

~~1.6 INSTRUMENTATION SURVEILLANCE~~

~~1.6.1~~ Actions

Action shall be that part of a specification ~~which~~ that prescribes ~~remedial measures~~ required ~~under designated conditions~~ actions to be taken under designated conditions within specified completion times.

~~1.6.2~~ Channel Calibration

Adjustment of the channel ~~output~~ such that it responds, within ~~acceptable~~ required range and accuracy, to known ~~value of the parameter which the channel measures~~ input. Calibration shall encompass the entire channel, including required sensor ~~the~~ alarm ~~on trip~~, interlock, display and trip functions, and shall be deemed to include the channel functional test.

A10

Insert C1.1-1

~~1.6.3~~ Channel Check

A qualitative ~~determination of acceptable operability~~ assessment, by observation, of channel behavior during operation. This determination will include, whenever possible, comparison of the channel indication and status with other independent channels ~~measuring~~ the same variable.

M3

~~1.6.4~~ Channel ~~Functional~~ operational Test (COT)

Injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify that it is operable, including required alarm, interlock, display and~~/or~~ trip initiating action.

Insert C1.1-2

A13

1.6.5 Source Check

A source check shall be the qualitative assessment of channel response when the channel sensor is exposed to a radioactive source.

A8

1.7 CONTAINMENT INTEGRITY

Containment integrity is defined to exist when: — See 3.6.1, 3.6.2, 3.6.3

L1

Calibration of instrument channels with RTD or thermocouple sensors may consist of an inplace qualitative assessment of sensor behavior and normal calibration of the remaining adjustable devices in the channel. Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION shall include an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

Specification 3.1.

3.10 REQUIRED SHUTDOWN MARGINS, CONTROL ROD, AND POWER DISTRIBUTION LIMITS

Applicability

Applies to the required shutdown margins, operation of the control rods, and power distribution limits.

Objective

To ensure (1) core subcriticality after a reactor trip and during normal shutdown conditions, (2) limited potential reactivity insertions from a hypothetical control rod ejection, and (3) an acceptable core power distribution during power operation.

Specification

3.10.1 Full Length Control Rod Insertion Limits

See 3.1. 3.1. 3.1.8

3.10.1.1 (Deleted by Change No. 21 issued 7/6/73)

3.10.1.2 When the reactor is critical, except for physics tests and full length control rod exercises, the shutdown control rods shall be limited in physical insertion as specified in the CORE OPERATING LIMITS REPORT (COLR).

3.10.1.3 When the reactor is critical, except for physics tests and full length control rod exercises, the control rods shall be limited in physical insertion as specified in the COLR. Control rod bank insertion beyond the limits specified in the COLR shall be corrected within the time criteria established by the axial power distribution methodology or within one (1) hour, whichever occurs sooner. If bank insertion is not restored to the specified limits (i.e., within one (1) hour or within the time criteria established by the axial power distribution methodology, whichever is sooner) the reactor shall be placed in the hot shutdown condition utilizing normal operating procedures within six (6) hours.

3.10.1.4 At 50 percent of the cycle as defined by burnup, the limits shall be adjusted to the end-of-core values as specified in the COLR.

Supplement 4

(A1)

TABLE 4.1-1 (Continued)

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

Channel Description	SR 3.1.7.1 Check	SR 3.1.7.4 Calibrate	SR 3.1.7.2 SR 3.1.7.3 Test	SR 3.1.7.1 Remarks
9. Analog Rod Position	S (1,2)	R	M	(1) With step counters (2) Following rod motion in excess of six inches when the computer is out of service (M27: Once within 4 hours)
10. Rod Position Bank Counters	S (1,2)	N.A.	N.A.	(1) Following rod motion in excess of six inches when the computer is out of service (M27: Once within 4 hours) (2) With analog rod position
11. Steam Generator Level	S	R	M	
12. Charging Flow	N.A.	R	N.A.	
13. Residual Heat Removal Pump Flow	N.A.	R	N.A.	
14. Boric Acid Tank Level	D (1)	R	N.A.	(1) Bubbler tube rodded weekly
15. Refueling Water Storage Tank Level	W	R	N.A.	
16. Deleted				
17. Volume Control Tank Level	N.A.	R	N.A.	
18. Containment Pressure	D	R	B/W (1)	(1) Containment isolation valve signal
19. Deleted by Amendment No. 85				
20. Boric Acid Makeup Flow Channel	N.A.	R	N.A.	

See ITS 3.3.1

Add LCO 3.1.7 and ACTIONS (L6)

ITS

A1

2.3 LIMITING SAFETY SYSTEM SETTINGS, PROTECTIVE INSTRUMENTATION

Applicability

Applies to trip settings for instruments monitoring reactor power and reactor coolant pressure, temperature, and flow and pressurizer level.

Objective

To provide for automatic protection action in the event that the principal process variables approach a safety limit.

Specification

[LCO 3.3.1] 2.3.1 Protective instrumentation settings for reactor trip shall be OPERABLE as follows:

2.3.1.1 Start-up protection

[T3.3.1-1 (2.b)] a. High flux, power range (low setpoint) ≤ 25% of rated power. 24

2.3.1.2 Core protection

[T3.3.1-1 (2.a)] a. High flux, power range (high setpoint) ≤ 109% of rated power 108

[T3.3.1-1 (7.b)] b. High pressurizer pressure ≤ 2385 psig. 2376

[T3.3.1-1 (7.a)] c. Low pressurizer pressure ≥ 1835 psig. 1844

M1

[T3.3.1-1 (5)] d. Overtemperature Δ T

[NOTE 1] The OTΔT Function Allowable Value shall not exceed the following Trip Setpoint by more than 2.96% of ΔT span.

L1

$$\leq \Delta T_0 \left\{ K_1 - K_2 \frac{(1 + \tau_1 S)}{(1 + \tau_2 S)} (T - T') + K_3 (P - P') - f(\Delta I) \right\}$$

M20

Add Trip Setpoints

Intermediate Range Neutron Flux	25% thermal power
Source Range Neutron Flux	1.0 E5 cps
Steam Generator water level low	30%
Coincident with Steam Flow/Feedwater Flow Mismatch	6.4E5 lbm/hr
Turbine Trip low autostop oil pressure	45 psig

[T3.3.1-1(5)]
[NOTE 1]

where:

ΔT_o = Indicated ΔT at rated thermal power, °F;
T = Average temperature, °F;
P = Pressurizer pressure, psig;
K_1 ≤ 1.1265; (≤ 1.1265) (A1)
K_2 = 0.01228;
K_3 = 0.00089;

$\frac{1 + \tau_1 S}{1 + \tau_2 S}$ = The function generated by the lead-lag controller for T_{avg} dynamic compensation; (LA1)

τ_1 & τ_2 = Time constants utilized in the lead-lag controller for T_{avg}, τ_1 = 20 seconds; τ_2 = 3 seconds; (≥ 20.08) (≤ 3.08) (L2)

T′ = 575.4°F Reference T_{avg} at rated thermal power; (≤)

P′ = 2235 psig (Nominal RCS Operating Pressure);

S = Laplace transform operator, sec^{-1};

and f(ΔI) is a function of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers; with gains to be selected based on measured instrument response during plant start-up tests such that:

1) For $(q_t - q_b)$ within +12% and -17%, where q_t and q_b are percent power in the top and bottom halves of the core, respectively, and $q_t + q_b$ is total core power in percent of rated power (2300 Mwt), f(ΔI) = 0. For every 2.4% below rated power (2300 Mwt) level, permissible positive flux difference range is extended by +1 percent. For every 2.4% below rated power (2300 Mwt) level, the permissible negative flux difference range is extended by -1 percent. (LA1)

2) For each percent that the magnitude of $(q_t - q_b)$ exceeds +12% in a positive direction, the ΔT trip setpoint shall be automatically reduced by 2.4% of the value of ΔT at rated power (2300 Mwt).

$2.4 (q_T - q_b) - 12$ percent (A2)

ITS

[T3.3.1-1 (5)] [NOTE 1]

(3) For each percent that the magnitude of $(q_t - q_b)$ exceeds -17% in the negative direction, the ΔT trip setpoint shall be automatically reduced by ~~2.4% of the value of ΔT at rated power (2300 Mwt)~~. 2.4 $(q_b - q_T)$ - 17 percent (A2) (A1)

[T3.3.1-1 (6)] [NOTE 2]

e. Overpower Δ T

The OPΔT Function Allowable Value shall not exceed the following Trip Setpoint by more than 3.17% of ΔT span (L1)

$$\leq \Delta T_o \left\{ K_4 - K_5 \left[\frac{\tau_3 S}{1 + \tau_3 S} \right] T - K_6 (T - T') - f(\Delta I) \right\}$$

where:

ΔT_o = Indicated ΔT at rated thermal power, °F;

T = Average temperature, °F;

T′ ~~=~~ ≤ 575.4°F Reference T_{avg} rated thermal power;

K_4 ~~= 1.07;~~ ≤ 1.06 (M1)

K_5 ~~=~~ ≥ 0.0 for decreasing average temperature, 0.02 sec/°F for increasing average temperature; (L2)

K_6 ~~=~~ ≥ 0.00277 for T > T′ and 0 for T ≤ T′;

S = Laplace transform operator, sec^{-1};

~~$\frac{\tau_3 S}{1 + \tau_3 S}$ = The function generated by the rate-lag controller for T_{avg} dynamic compensation;~~ (LF1)

τ_3 = ~~Time constant utilized in the rate-lag controller for T_{avg},~~ τ_3 ~~≤ 10~~ ≥ 9 seconds; (L2)

f(ΔI) = As defined in d. above (M1)

[T3.3.1-1 (9)] f. Low reactor coolant loop flow ≥ ~~90%~~ 91 of normal indicated flow. a. Single loop b. Two loops (A3)

[T3.3.1-1 (12)] g. Low reactor coolant pump frequency ≥ ~~57.5~~ 58.2 Hz.

[T3.3.1-1 (11)] h. Undervoltage ≥ ~~70% of normal voltage~~ 3120

2.3.1.3 Other Reactor Trips

[T3.3.1-1 (8)] a. High pressurizer water level ≤ ~~92%~~ 91 of span. (M1)

[T3.3.1-1 (13)] b. Low-low steam generator water level ≥ ~~14%~~ 16 of narrow range instrument span.

Specification 3.3.1

(A1)

TABLE 3.5-2

REACTOR TRIP INSTRUMENTATION LIMITING OPERATING CONDITIONS

ITS

(A27)

NO.	FUNCTIONAL UNIT	1 TOTAL NO. OF CHANNELS	2 MINIMUM CHANNELS OPERABLE	3 OPERATOR ACTION IF COLUMN 1 OR 2 CANNOT BE MET	APPLICABLE CONDITIONS
[T3.3.1-1(1)] 1.	Manual	2 2	2 2	ACTION 8 (B) ACTION 8 (C)	Reactor Critical (MODES 1, 2) Hot/Cold Shutdown* (Modes 3, 4, 5) (a)
[T3.3.1-1(2)] 2.	Nuclear Flux Power Range* A. High Setpoint B. Low Setpoint	 4 4	 3 3	 ACTION 2 (D) ACTION 2 (E)	(MODES 1, 2) Reactor Critical Reactor Critical** (MODES 1, 2) (b) (c)
[T3.3.1-1(3)] 3.	Nuclear Flux Intermediate Range	2	2	ACTION 3 (F, G, H)	Reactor Critical** (A28) (A31) (d) (e)
[T3.3.1-1(4)] 4.	Nuclear Flux Source Range A. Startup B. Shutdown C. Shutdown	 2 2 (1) 2	 2 1 2	 ACTION 4 (I) (L) ACTION 5 ACTION 8 (K)	(MODE 2) Reactor Critical*** Hot/Cold Shutdown Hot/Cold Shutdown* (MODES 3, 4, 5) (a)
[T3.3.1-1(5)] 5.	Overtemperature ΔT	3	2	ACTION 6 (E)	Reactor Critical (MODES 1, 2)
[T3.3.1-1(6)] 6.	Overpower ΔT	3	2	ACTION 6 (Add ACTIONS M49)	Reactor Critical
[T3.3.1-1(2a)] 7.	Low Pressurizer Pressure	3	2	ACTION 6 (M) (L10)	***** (MODE 1 (f))
[T3.3.1-1(2b)] 8.	Hi Pressurizer Pressure	3	2	ACTION 6 (E)	Reactor Critical (MODES 1, 2)
[T3.3.1-1(8)] 9.	Pressurizer-Hi Water Level	3	2	ACTION 6 (M) (L10)	***** (MODE 1 (f))
[T3.3.1-1(9)] 10.	Low Reactor Coolant Flow A. Single Loop B. Two Loop	 3/loop 3/loop	 2/loop 2/loop	 ACTION 6 (M) ACTION 6 (M)	(MODE 1 (g)) ≥45% of rated power **** (MODE 1 (...))

Amendment No. ~~85~~, 175

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(A1)

ITS

TABLE 3.5.2 (Continued)

REACTOR TRIP INSTRUMENTATION LIMITING OPERATING CONDITIONS

TABLE NOTATIONS

(a) * With the reactor trip breakers closed [and rods not fully inserted or Rod Control System capable of rod withdrawal] (L35)

(b) ** Below the P-10 (Low Setpoint Power Range Neutron Flux Interlock) setpoint.

(d) *** Below the P-6 (Intermediate Range Neutron Flux Interlock) setpoint.

(h) **** Above the P-10 (Low Setpoint Power Range Neutron Flux Interlock) setpoint or P-7 (Turbine First Stage Pressure Interlock) setpoint and below the P-8 (Low Setpoint Power Range Neutron Flux Interlock) setpoint. (L5)

(f) ***** Above the P-10 (Low Setpoint Power Range Neutron Flux Interlock) setpoint or P-7 (Turbine First Stage Pressure Interlock) setpoint. (A30)

Add Note (c) (A31)

ACTION STATEMENTS

Add Note (e)

[ACTION B] ACTION 1 With the number of OPERABLE channels (48) one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 12 hours, or be in the HOT SHUTDOWN CONDITION [Mode 3] within the next 6 hours, [and open RTBs in 55 hours] (L6)

[ACTION D] ACTION 2 With the number of OPERABLE channels one less than the Total Number of Channels, Startup and/or Power Operation may proceed provided the following Conditions are satisfied: (L7)

[Add RA D.2.2 "NOTE"]

[ACTION E]

a. The inoperable channel is placed in the tripped condition within 1 hour (6) (L8)

[ACTION D]

b. Either, thermal power is restricted to less than or equal to 75% of rated power and the Power Range Neutron Flux trip setpoint is reduced to less than or equal to 85% of rated power within 4 hours; or, the Quadrant Power Tilt Ratio is monitored within 12 hours and every 12 hours thereafter, using the movable incore detectors to confirm that the normalized symmetric power distribution is consistent with the indicated Quadrant Power Tilt Ratio [be in MODE 3 in 12 hours] (M6)

[ACTION E]

ACTION 3 With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement and with the thermal power level:

[ACTION H]

a. Below the P-6 (Intermediate Range Neutron Flux Interlock) setpoints, restore the inoperable channel to OPERABLE status prior to increasing thermal power above the P-6 setpoint.

[ACTION F]

b. Above the P-6 (Intermediate Range Neutron Flux Interlock) setpoint but below 10% of rated power, restore the inoperable channel to OPERABLE status prior to increasing thermal power above 10% of rated power. (M7)

[Reduce power to < P6 in 2 hours or increase power to > P10 in 2 hours.] (L36)

[With the number of channels OPERABLE one or two less than the Minimum Channels OPERABLE] (L38)

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A1

3.10.4 Rod Drop Time

3.10.4.1 The drop time of each control rod shall be not greater than 1.8 seconds at full flow and operating temperature from the beginning of rod motion to dashpot entry. (See 3.1.4)

3.10.5 Reactor Trip Breakers

[T3.3.1-1 (18,19,20)] [Applicability] 3.10.5.1 The reactor shall not be made critical [MODES 1, 2] unless the following conditions are met: A18

[T 3.3.1-1 (18,19)] a. Two reactor trip breakers [with undervoltage and shunt trip mechanisms] are operable. [Add Note(s)] A32

b. Reactor trip bypass breakers are racked out or removed. LA3

[T3.3.1-1 (20)] c. Two trains of automatic trip logic are operable.

[Action Q] [Action R] 3.10.5.2 During power operation [MODE 3], the requirements of 3.10.5.1 may be modified to allow the following components to be inoperable. If the system is not restored to meet the requirements of 3.10.5.1, the reactor shall be placed in the hot shutdown condition utilizing normal operating procedures within the next ~~8~~ 6 hours. M8

[Action R] a. One reactor trip breaker may be inoperable for up to ~~12~~ 1 hours.

[Action Q] b. One train of automatic trip logic may be inoperable for up to ~~12~~ 6 hours.

[Action Q Note] [Action R Note] c. One reactor trip bypass breaker may be racked in and closed for up to 12 hours.

[Action U] 3.10.5.3 With one of the diverse trip features inoperable (shunt trip attachment/undervoltage trip attachment) on one of the reactor trip breakers, power operation may continue for up to 48 hours. If the

Add Table 3.3.1-1 Items 18, 19, 20 for MODE Applicability 3(a), 4(a), 5(a) and Required Actions V and C (M9)

Add SR "NOTE" (A5)

(L39)

ITS

TABLE 4.1-1
MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

	Channel Description	Check	Calibrate	Test	Remarks
[T3.3.1-1(2.a)] 1.	Nuclear Power Range	S SR 3.3.1.1	D (1) M (3) R (3) SR 3.3.1.2 SR 3.3.1.11	B/W (2) SR 3.3.1.7 SR 3.3.1.8	(1) Thermal Power calculations during power operations (2) Signal to ΔT: bistable action (permissive, rod stop, trips) (3) Upper and lower chambers for symmetric offset: monthly during power operations when periods of reactor shutdown extend this interval beyond one month, the calibration shall be performed immediately following return to power.
[T3.3.1-1(3)] 2.	Nuclear Intermediate Range	S(1) SR 3.3.1.1	N.A. SR 3.3.1.11	S/U (2) SR 3.3.1.8	(1) Once/shift when in service (2) Log level: bistable action (permissive, rod stop, trip)
[T3.3.1-1(4)] 3.	Nuclear Source Range	S(1) SR 3.3.1.1	N.A. SR 3.3.1.11	S/U (2) SR 3.3.1.7 SR 3.3.1.8	(1) Once/shift when in service (2) Bistable action (alarm, trip)
T3.3.1-1(5,6)] 4.	Reactor Coolant Temperature OTΔT and OPΔT	S SR 3.3.1.1	R (4) SR 3.3.1.12 SR 3.3.1.3 SR 3.3.1.6	B/W (1)(2) SR 3.3.1.7 R (3)	(1) Overtemperature - ΔT (2) Overpower - ΔT (3) Narrow Range RTD response time (4) To include narrow range RTD cross calibration
[T3.3.1-1(9)] 5.	Reactor Coolant Flow	S SR 3.3.1.1	R SR 3.3.1.10	M SR 3.3.1.7	
[T3.3.1-1(8)] 6.	Pressurizer Water Level	S SR 3.3.1.1	R SR 3.3.1.10	M SR 3.3.1.7	
[T3.3.1-1(7)] 7.	Pressurizer Pressure	S SR 3.3.1.1	R SR 3.3.1.10	M SR 3.3.1.7	
[T3.3.1-1(11)] 8.	4 KV Voltage RCP	N.A	R SR 3.3.1.10	M SR 3.3.1.9	Reactor Protection circuits only

By means of the moveable in-core detector system

(L14) (A33) (A7) (L15) (M15) (A7) (M16) (A7) (LA8) (L14) (M14) (L16) (A7)

[T3.3.1-1(2.b)] Add SR 3.3.1.1, SR 3.3.1.8 and SR 3.3.1.11 for Power Range Neutron Flux-Low

Amendment No. 83, 88, 121

Add SRs 3.3.1.1, 3.3.1.2, 3.3.1.3, 3.3.1.4, 3.3.1.5, 3.3.1.6, 3.3.1.7, 3.3.1.8, 3.3.1.9, 3.3.1.10, 3.3.1.11, 3.3.1.12, 3.3.1.13, 3.3.1.14, and 3.3.1.15 (A25) (A1)

Specification 3.3.1

ITS

TABLE 4.1-1 (Continued)

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

	Channel Description	Check	Calibrate	Test	Remarks
9.	Analog Rod Position	S (1,2)	R	M	(1) With step counters (2) Following rod motion in excess of six inches when the computer is out of service
10.	Rod Position Bank Counters	S (1,2)	N.A.	N.A.	(1) Following rod motion in excess of six inches when the computer is out of service (2) With analog rod position
[T3.3.1-1 (13)] 11.	Steam Generator Level	S SR 3.3.1.1	R SR 3.3.1.10	M SR 3.3.1.7	
12.	Charging Flow	N.A.	R	N.A.	
13.	Residual Heat Removal Pump Flow	N.A.	R	N.A.	
14.	Boric Acid Tank Level	D (1)	R	N.A.	(1) Bubbler tube rodded weekly
15.	Refueling Water Storage Tank Level	W	R	N.A.	
16.	Deleted				
17.	Volume Control Tank Level	N.A.	R	N.A.	
18.	Containment Pressure	D	R	B/W (1)	(1) Containment isolation valve signal
19.	Deleted by Amendment No. 85				
20.	Boric Acid Makeup Flow Channel	N.A.	R	N.A.	

See ITS 3.1.7

L6

LA4

[T3.3.1-1 (10)] Add SR 3.3.1.14 for RCP Breaker Position
[T3.3.1-1 (16)] Add SR 3.3.1.14 for SI input from ESFAS

M14

A1

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Specification 3.3.1

ITS

TABLE 4.1-1 (Continued)

	Channel Description	Check	Calibrate	Test	Remarks
	21. Containment Sump Level	N.A.	R	N.A.	See 3.4.15
[T 3.3.1-1(15)]	22. Turbine Trip Logic**	N.A.	N.A. SR 3.3.1.10	S SR 3.3.1.15	M17
	23. Accumulator Level and Pressure	S	R	N.A.	LA4
	24. Steam Generator Pressure	S	R	M	LA4
[T 3.3.1-1(17.e)]	25. Turbine First Stage Impulse Pressure	S SR 3.3.1.1	S SR 3.3.1.10	M SR 3.3.1.13	L17
	26. DELETED				
[T 3.3.1-1(20)]	27. Logic Channel Testing Automatic Trip	N.A.	N.A.	M(1) S/U(2) SR 3.3.1.5 on a STAGGERED TEST BASIS	Applicability MODES 1, 2, 3, 4, 5 (M18) (1) During hot shutdown and power operations. When periods of reactor cold shutdown and refueling extend this interval beyond one month, this test shall be performed prior to startup. (M19) (2) Logic channel testing for nuclear source range channels shall only be required prior to each reactor startup, if not performed within the previous seven (7) days. (L18)
	28. DELETED				
[T 3.3.1-1(12)]	29. 4 KV Frequency RCPs	N.A.	R SR 3.3.1.10	R SR 3.3.1.14	

[T 3.3.1-1(15)] ** Stop valve closure or low EH fluid pressure.

[T 3.3.1-1 (17.a.-d)] Add SR 3.3.1.11 and SR 3.3.1.13 for RPS interlocks P-6, P-8, P-10 and SR 3.3.1.13 and SR 3.3.1.14 for RPS interlock P-7 (M14)

A1

Specification 3.3.1

ITS

TABLE 4.1-1 (Continued)

	Channel Description	Check	Calibrate	Test	Remarks
[T3.3.1-1 (18, 19)] 30.	Reactor Trip Breakers	N.A.	N.A.	M(1) SR 3.3.1.4	(1) The reactor trip breaker trip actuating device operational test shall verify the operability of the UV trip attachment and the shunt trip attachment, individually.
31.	Overpressure Protection System	N.A.	R	M	

L19

LA8

See 3.4.12

Add SR 3.3.1.2 NOTES 1 (A33) and 2 (L40)
SR 3.3.1.3 NOTES 1 (A34) and 2 (L40)
SR 3.3.1.4 NOTE (A35)
SR 3.3.1.6 NOTE
SR 3.3.1.7 NOTE (L40)
SR 3.3.1.8 NOTE (A36)
SR 3.3.1.9 NOTE (A37)
SR 3.3.1.10 NOTE (A38)
SR 3.3.1.11 NOTE (L41)
SR 3.3.1.12 NOTE (A38)
SR 3.3.1.14 NOTE
SR 3.3.1.15 NOTE (A37)

A1

Supplement 4

Specification 3.3.1

ITS

TABLE 4.1-1 (Continued)

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

	Channel Description	Check	Calibrate	Test	Remarks	
	b. Main Vent Stack					See 3.3.3
	High Range	D	R	Q		
	Mid Range	D	R	Q		
	c. Spent Fuel Pit Lower Level					M21
	High Range	D	R	Q		
[T3.3.1-1(14)]	39. Steam/Feedwater Flow Mismatch	N.A. SR 3.3.1.1	R SR 3.3.1.10	R SR 3.3.1.7		L16
[T3.3.1-1(14)]	40. Low Steam Generator Water Level	N.A. SR 3.3.1.1	R SR 3.3.1.10	R SR 3.3.1.7		
	41. CV Level (Wide Range)+	M	R	R		See 3.3.3
	42. CV Pressure (Wide Range)++	M	R	R		
	43. CV Hydrogen Monitor+++	M	R	R		
	44. CV High Range Radiation Monitor++++	M	R#	R		
	45. RCS High Point Vents	N.A.	N.A.	R		See Relocated Specifications
[T3.3.1-1(1)]	46. Manual Reactor Trip	N.A.	N.A.	R(1) SR 3.3.1.14	(1) The manual reactor trip operational test shall verify the independent operability of the manual shunt trip circuit and the manual UV trip circuit on the reactor trip breakers. The test shall also verify the operability of the UV trip circuit on the bypass breakers.	A7
[T3.3.1-1(1,18,19)]	47. Reactor Trip Bypass Breakers	N.A.	N.A.	M(3), R(4) SR 3.3.1.4 SR 3.3.1.14	(3) Remote manual UV trip required only when placing the bypass breaker in service. (4) Perform UV trip from protection system.	L20

Specification 3.3.1

A1

Supplement 4

Specification 3.3.2
(A1)

ITS

TABLE 4.1-3

FREQUENCIES FOR EQUIPMENT TESTS

		Check	Frequency	Maximum Time Between Tests	
1.	Control Rods	Rod drop times of all full length rods	Each refueling shutdown	NA*	See 3.1.4
2.	Control Rod	Partial movement of all full length rods	Every 2 weeks during reactor critical operations	20 days	
3.	Pressurizer Safety Valves	Set point	Each refueling shutdown	NA	See 3.4.10
4.	Main Steam Safety Valves	Verify each required MSSV lift setpoint per Table 4.1-4 in accordance with the Inservice Testing Program. Following testing, lift setting shall be within +/- 1%.	In accordance with the Inservice Testing Program	NA	See 3.7.1
[T3.3.2-1(3) SR 3.3.2.6] 5.	Containment Isolation Trip	~~Functioning~~ TADOT	~~Each refueling shutdown~~ 18 Months (M26)	NA	
6.	Refueling System Interlocks	Functioning	Prior to each refueling shutdown	NA	See 3.9.1
7.	Service Water System	Functioning	Each refueling shutdown	NA	See 3.7.7
8.	DELETED				
9.	Primary System Leakage	Evaluate	Daily when reactor coolant system is above cold shutdown condition	NA	See 3.4.13
10.	Diesel Fuel Supply	Fuel Inventory	Weekly	10 days	See 3.8.3
11.	DELETED				
12.	Turbine Steam Stop, Control, Reheat Stop, and Interceptor Valves	Closure	Quarterly during power operation and prior to startup	115 days	See 3.7.1

Add SR 3.3.2.6 "NOTE" ← (A10)

Specification 3.3.2 (A1)

ITS

TABLE 3.5-3

ENGINEERED SAFETY FEATURES INSTRUMENTATION LIMITING OPERATING CONDITIONS

(A27)

	NO.	FUNCTIONAL UNIT	1 TOTAL NO. OF CHANNELS	2 MINIMUM CHANNELS OPERABLE	3 OPERABLE ACTION IF COLUMN 1 OR 2 CANNOT BE MET	APPLICABLE CONDITIONS
	1.	SAFETY INJECTION				MODE 1,2,3,4
[T3.3.2-1(1a)]	A.	Manual	2	2	ACTION 1 (B)	>200°F
[T3.3.2-1(1c)]	B.	High Containment Pressure (Hi Level)	3	2	ACTION 12 (E)	>200°F
[T3.3.2-1(1e)]	C.	High Differential Pressure between Any Steam Line and the Steam Header	3/Steam Line	2/Steam Line	ACTION 12 (D)	# MODE 1,2,3(a)
[T3.3.2-1(1d)]	D.	Pressurizer Low Pressure	3	2	ACTION 12 (D)	# MODES 1,2,3(a)
[T3.3.2-1(1f)]	E.	High Steam Flow in 2/3 Steam Lines Coincident with Low T_{avg} in 2/3 loops	2/Steam Line and 1 T_{avg} Loop	1/Steam Line and 1 T_{avg} in 2 Loops OR 2/Steam Line and 1 T_{avg}	ACTION 12 (D)	≥350°F ## MODES 1, 2(c), 3(c) (A11)
[T3.3.2-1(1g)]	F.	High Steam Flow in 2/3 Steam Lines Coincident with Low Steam Pressure in 2/3 lines	2/Steam Line and 1 Press/Line	1/Steam Line and 1 Press in 2 Lines OR 2/Steam Line and 1 Press	ACTION 12 (E)	≥350°F ##
	2.	CONTAINMENT SPRAY			(M24)	MODES 1,2,3,4
[T3.3.2-1(2a)]	A.	Manual	2	2	ACTION 1 (I)	>200°F
[T3.3.2-1(2c)]	B.	High Containment Pressure (Hi Hi Level)	3/Set	2/Set	ACTION 12 (E)	>200°F

Amendment No. ~~85~~. 175

Supplement 4

Specification 3.3.2

(A1)

TABLE 3.5-3 (Continued)

ITS

ENGINEERED SAFETY FEATURES INSTRUMENTATION LIMITING OPERATING CONDITIONS

TABLE NOTATIONS

[T3.3.2-1 NOTE a] # Above Low Pressure SI Block Permit interlock.

[T3.3.2-1 Note c] ## Trip function may be blocked below Low T_{avg} Interlock setpoint.

The reactor may remain critical below the Power Operating conditions with this feature inhibited for the purpose of starting reactor coolant pumps.

(See 3.3.5)

[ACTION B] ACTION 11 With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in at least the Hot Shutdown Condition within the next 8 hours and the Cold Shutdown Condition within the following 30 hours. (6) (M22)

[ACTION C, G]

[ACTION D, ACTION E] ACTION 12 With the number of OPERABLE channels one less than the Total Number of Channels, Power Operation may proceed until performance of the next required operational test provided the inoperable channel is placed into the tripped condition within 1 hour. (6) (or restore OPERABLE in 6 hours) (L21)

[ACTION I] ACTION 13 With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 1 hour or be in at least the Hot Shutdown Condition within the next 8 hours and the Cold Shutdown Condition within the following 30 hours. (MODE 3 in 7 hrs, MODE 4 in 13 hrs, MODE 5 in 37 hrs) (M24)

ACTION 14 With the number of OPERABLE channels one less than the Total Number of Channels, place the inoperable channel into the blocked condition within 1 hour, and restore the inoperable channel to OPERABLE status within 48 hours or be in at least the Hot Shutdown Condition within the next 8 hours and the Cold Shutdown Condition within the following 30 hours. (See 3.3.5)

(M23)

[ACTION C] or be in MODE 3 in 12 hours and MODE 5 in 42 hours

[ACTION D, G] or be in MODE 3 in 12 hours and MODE 4 in 18 hours

[ACTION E] or be in MODE 3 in 12 hours, MODE 4 in 18 hours and MODE 5 in 42 hours

Add ACTIONS "Note 1" (A5)

Add ACTIONS Note 2 (L50)

Amendment No. 175

Supplement 4

Specification 3.3.2

(A1)

TABLE 3.5-4

ISOLATION FUNCTIONS INSTRUMENTATION LIMITING OPERATING CONDITIONS

ITS

(A27)

NO.	FUNCTIONAL UNIT	1 TOTAL NO. OF CHANNELS	2 MINIMUM CHANNELS OPERABLE	3 OPERABLE ACTION IF COLUMN 1 OR 2 CANNOT BE MET	APPLICABLE CONDITIONS
1.	CONTAINMENT ISOLATION				
A.	Phase A				
[T 3.3.2-1 (3a3)] i.	Safety Injection	See Item No. 1 of Table 3.5-3 for all Safety Injection initiating functions and requirements			MODES 1,2,3,4
[T 3.3.2-1 (3a1)] ii.	Manual	2	(2)	ACTION (1) (B)	>200°F (A27)
[T3.3.2-1 (3b)] B.	Phase B	See Item No. 2 of Table 3.5-3 for all Containment Spray initiating functions and requirements			
C.	Ventilation Isolation				
i.	High Containment Activity. Gaseous	1	0	ACTION 15	During Containment Purge
ii.	High Containment Activity. Particulate	1	0	ACTION 15	During Containment Purge
iii.	Phase A	See Item No. 1.A of Table 3.5-4 for all Phase A initiating functions and requirements			

(See 3.3.6)

Add Table 3.3.2-1 Items 1b, 2b, 3a(2), 3b(2), 4b, and 5a

(L13)

Add ACTIONS C, G.

(L43)

Add Note (f) to Applicability of MODES 2 and 3

Amendment No. ~~85~~. 175

Supplement 1

Specification 3.3.2 (A1)

TABLE 3.5-4 (Continued)

ISOLATION FUNCTIONS INSTRUMENTATION LIMITING OPERATING CONDITIONS

ITS

(A27)

NO.	FUNCTIONAL UNIT	1 TOTAL NO. OF CHANNELS	2 MINIMUM CHANNELS OPERABLE	3 OPERABLE ACTION IF COLUMN 1 OR 2 CANNOT BE MET	APPLICABLE CONDITIONS
2.	STEAM LINE ISOLATION				
[T3.3.2-1 (4d)] A.	High Steam Flow in 2/3 Steam Lines Coincident with Low T_{avg} in 2/3 loops	See Item No. 1.E of Table 3.5-3 for initiating functions and requirements			
[T3.3.2-1(4e)] B.	High Steam Flow in 2/3 Steam Lines Coincident with Low Steam Pressure in 2/3 lines	See Item No. 1.F of Table 3.5-3 for initiating functions and requirements			
[T3.3.2-1 (4c)] C.	High Containment Pressure (Hi Hi Level)	See Item No. 2.B of Table 3.5-3 for initiating functions and requirements			
[T3.3.2-1 (4a)] D.	Manual	1/Line	1/Line	ACTION 16 (F)	≥ 350°F (MODES 1, 2(b), 3(b))
3.	FEEDWATER LINE ISOLATION				
[T3.3.2-1(5)] A.	Safety Injection	See Item No. 1 of Table 3.5-3 for all Safety Injection initiating functions and requirements			

Add Note (b) to Applicability (L42)

ACTION D (A1)

Add Note (b) to MODE 2 and 3 APPLICABILITY (L42)

Delete MODE 4 (L49)

(A27) (M25) (L42)

Add Note 2 to Surveillance Requirements (L50)

Add ACTION H

SR 3.3.2.1 SR 3.3.2.5

SR 3.3.2.3 SR 3.3.2.7

SR 3.3.2.4

T 3.3.2-1 Item 6

(M27)

Add T 3.3.2-1 "Allowable Value" column (M12)

Specification 3.3

A1

TABLE 3.5-5
(THIS TABLE APPLIES WHEN THE RCS IS > 360°F) IN MODES 1, 2, 3
INSTRUMENTATION TO FOLLOW THE COURSE OF AN ACCIDENT

ITS [T 3.3.3-1 ITEM #]	NO.	INSTRUMENT	1 MINIMUM CHANNELS OPERABLE	2 OPERATOR ACTION IF CONDITIONS OF COLUMN 1 CANNOT BE MET
[12]	1	Pressurizer Level	2	See Item 3 Table 3.5-9 (A,B,C,G)
[19]	2	Auxiliary Feedwater Flow Indication (Primary Indication)		(A,B,C,H) Note 1
		SD AFW Pump	1 per S/G	
		MD AFW Pump	1 per S/G	
	3	Reactor Coolant System Subcooling Monitor	1	Note 2 (R1)
[22]	4	PORV Position Indicator (Primary)	1	Note 3 (A,B,C,H)
[23]	5	PORV Blocking Valve Position Indicator (Primary)	1	Note 3
[24]	6	Safety Valve Position Indicator (Primary)	1	Note 3
	7	Noble Gas Effluent Monitors*****		(R1)
		a. Main Steam Line	1 per steamline	Note 4
		b. Main Vent Stack		
		High Range	1	Note 4
		Mid Range	1	Note 4
		c. Spent Fuel Pit-Lower Level		
		High Range	1	Note 4
[10]	8	CV High Range Radiation Monitor****	2	Note 4 (A,B,C,H) (L22)
[7]	9	CV Level (Wide Range)*	2	Note 5
[8]	10	CV Pressure (Wide Range)**	2	Note 5 (M47)
[11]	11	CV Hydrogen Monitor***		Note 6 (G) (M31)
	12	Reactor Vessel Level Instrumentation System (RVLIS)	2	Note 7 (R1)
[15-18]	13	Incore Thermocouple (T/C)	2 T/C per core quadrant	(A,B,C,G) Note 8

* Containment Water Level Monitor - NUREG-0737 Item II.F.1.5
** Containment Pressure Monitor - NUREG-0737 Item II.F.1.4
*** Containment Hydrogen Monitor - NUREG-0737 Item II.F.1.6
**** Containment High-Range Radiation Monitor - NUREG-0737 Item II.F.1.3
***** Noble Gas Effluent Monitors - NUREG-0737 Item II.F.1.1

(A19)

Amendment No. 94, 126

Supplement 4

Specification 3.3.3

(A1)

TABLE 3.5-5 (Continued)

ITS

INSTRUMENTATION TO FOLLOW THE COURSE OF AN ACCIDENT

TABLE NOTATION

Note 4: With the number of OPERABLE Channels less than required by the Minimum Channels OPERABLE requirement, restore the inoperable Channel(s) to OPERABLE status within 7 days or, prepare and submit a Special Report to the NRC within the following 14 days detailing the cause of the inoperable Channel(s), the action being taken to restore the Channel(s) to operable status, the estimated date for completion of repairs, and any compensatory action being taken while the Channel(s) is inoperable. (R1)

[ACTION A] [ACTION B]

Note 5: If one channel is inoperable, restore the channel to operable status within 30 days or, prepare and submit a special report to the NRC within the following 14 days detailing the cause(s) of the inoperable channels, the actions being taken to restore the channel to operable status, the estimated date for completion of the repairs, and the compensatory action being taken while the channel is inoperable. (initiate action per 5.6.6) (See 5.6.6) If both channels become inoperable and a pre-planned alternate method of monitoring is available, then (LA6) restore at least one channel to operable status within 7 days or prepare and submit a special report to the NRC within the following 14 days detailing the cause(s) of the inoperable channels, the action being taken to restore at least one channel to operable status, the estimated date for completion of the repairs, and a description of the alternate method of monitoring the affected parameter while both channels are inoperable. (See 5.6.6) If a pre-planned alternate method of monitoring the affected parameter is not available and implemented with both channels inoperable, then restore at least one channel to an operable status within 7 days or be in Hot Shutdown within 6 hours and ≤ 350°F within the following 30 hours. (L44)

[ACTION C] [ACTION H]

[ACTION E] [ACTION G]

Note 6: With both channels inoperable, restore at least one channel to an operable status within 14 days (72 hours) or be in Hot Shutdown (MODE 3) within 6 hours and ≤ 200°F (MODE 4) within the following 30 (6) hours.

(L24) (M31) (L24)

Add Functions & Requirements:
- SG Pressure
- Cont. Spray Additive Tank Level
- Cont. Isolation Valve Position Indication
- SG Level
- Power Range Neutron Flux
- Source Range Neutron Flux
- RCS Pressure
- RCS Hot Leg Temperature
- RCS Cold Leg Temperature
- RWST Level
- CST Level

(M32)

TABLE 4.1-1 (Continued)

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

	Channel Description	Check	Calibration	Test	Remarks
32.	Loss of Power				See 3.3.5
	a. 480 Emerg. Bus Undervoltage (Loss of Voltage)	N.A.	R	R	
	b. 480 Emerg. Bus Undervoltage (Degraded Voltage)	N.A.	R	R	
33.	Auxiliary Feedwater Flow**** Indication	M [SR 3.3.3.1]	R [SR 3.3.3.2]	N.A.	
34.	Reactor Coolant System Subcooling Monitor	M	R	N.A.	R1
35.	PORV Position Indicator***	N.A. [SR 3.3.3.1]	N.A. [SR 3.3.3.2]	R	M34
36.	PORV Blocking Valve*** Position Indicator	N.A. [SR 3.3.3.1]	N.A. [SR 3.3.3.2]	R	M34
37.	Safety Relief Valve Position*** Indicator	N.A. [SR 3.3.3.1]	N.A. [SR 3.3.3.2]	R	L27
38.	Noble Gas Effluent Monitors*****				R1
	a. Main Steam Line	Q	R	Q	

** Instrument for Detection of Inadequate Core Cooling - NUREG 0578 Item 2.1.3.b.
*** Direct Indication of Power Operated Relief Valve and Safety Valve Position - NUREG 0578 Item 2.1.3.a.
**** Auxiliary Feedwater Flow Indication to Steam Generator - NUREG 0578 Item 2.1.7.b.
***** Noble Gas Effluent Monitors - NUREG-0737 Item II.F.1.1.

A19

Supplement 7

Specification 3.3.3

TABLE 3.5-3 (Continued)

ENGINEERED SAFETY FEATURES INSTRUMENTATION LIMITING OPERATING CONDITIONS

TABLE NOTATIONS

See 3.3.2

Above Low Pressure SI Block Permit interlock.
Trip function may be blocked below Low T_{avg} Interlock setpoint.
The reactor may remain critical below the Power Operating conditions with this feature inhibited for the purpose of starting reactor coolant pumps.

[Applicability NOTE]

ACTION 11 With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in at least the Hot Shutdown Condition within the next 8 hours and the Cold Shutdown Condition within the following 30 hours.

ACTION 12 With the number of OPERABLE channels one less than the Total Number of Channels. Power Operation may proceed until performance of the next required operational test provided the inoperable channel is placed into the tripped condition within 1 hour.

ACTION 13 With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 1 hour or be in at least the Hot Shutdown Condition within the next 8 hours and the Cold Shutdown Condition within the following 30 hours.

ACTION 14 With the number of OPERABLE (loss of Voltage Function) channels (per bus) one less than the Total Number of Channels: ~~place~~ (restore) the inoperable channel into the blocked condition within 1 hour ~~and restore the inoperable channel to OPERABLE status within 48 hours or be in at least the Hot Shutdown Condition within the next 8 hours and the Cold Shutdown Condition within the following 30 hours.~~ (or enter applicable condition(s) and RA(s) for the associated DG made inoperable by LOP DG start instrumentation immediately)

[Action A]

(L28)

(A1)

ITS

TABLE 3.5-3 (Continued)

ENGINEERED SAFETY FEATURES INSTRUMENTATION LIMITING OPERATING CONDITIONS

TABLE NOTATIONS

\# Above Low Pressure SI Block Permit interlock.

\## Trip function may be blocked below Low T_{avg} Interlock setpoint (See 3.3.2)

\### The reactor may remain critical below the Power Operating conditions with this feature inhibited for the purpose of starting reactor coolant pumps. [Applicability Note]

ACTION 11 With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in at least the Hot Shutdown Condition within the next 8 hours and the Cold Shutdown Condition within the following 30 hours.

ACTION 12 With the number of OPERABLE channels one less than the Total Number of Channels. Power Operation may proceed until performance of the next required operational test provided the inoperable channel is placed into the tripped condition within 1 hour.

ACTION 13 With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 1 hour or be in at least the Hot Shutdown Condition within the next 8 hours and the Cold Shutdown Condition within the following 30 hours.

ACTION 14 With the number of OPERABLE channels (per bus) one less than the Total Number of Channels, place the inoperable channel into the ~~blocked~~ (tripped) condition within (1) hour ~~and restore the inoperable channel to OPERABLE status within 48 hours or be in at least the Hot Shutdown Condition within the next 8 hours and the Cold Shutdown Condition within the following 30 hours.~~ (L29)

[ACTION B] (6)

[ACTION D]

Degraded Voltage function

or enter applicable condition(s) and RA(s) for the associated DG made inoperable by LOP DG start instrumentation immediately

Add RA B.1 "Note" (L30)

Add ACTION C (M37)

TABLE 4.1-1 (Continued)

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

	Channel Description	Check	Calibration	Test	Remarks
32.	Loss of Power				
	a. 480 Emerg. Bus Undervoltage (Loss of Voltage)	N.A.	R SR 3.3.5.2	R SR 3.3.5.1	
	b. 480 Emerg. Bus Undervoltage (Degraded Voltage)	N.A.	R SR 3.3.5.2	R SR 3.3.5.1	
33.	Auxiliary Feedwater Flow**** Indication	M	R	N.A.	
34.	Reactor Coolant System** Subcooling Monitor	M	R	N.A.	
35.	PORV Position Indicator***	N.A.	N.A.	R	
36.	PORV Blocking Valve*** Position Indicator	N.A.	N.A.	R	
37.	Safety Relief Valve Position*** Indicator	N.A.	N.A.	R	
38.	Noble Gas Effluent Monitors*****				
	a. Main Steam Line	D	R	Q	

L45

See 3.3.3

** Instrument for Detection of Inadequate Core Cooling - NUREG 0578 Item 2.1.3.b.
*** Direct Indication of Power Operated Relief Valve and Safety Valve Position - NUREG 0578 Item 2.1.3.a.
**** Auxiliary Feedwater Flow Indication to Steam Generator - NUREG 0578 Item 2.1.7.b.
***** Noble Gas Effluent Monitors - NUREG-0737 Item II.F.1.1.

Supplement 4

Specification 3.3.5

A1

Specification 3.3.5

(A.)

ITS

TABLE 3.5-1

ENGINEERED SAFETY FEATURE SYSTEM INITIATION INSTRUMENT SETTING LIMITS

NO.	FUNCTIONAL UNIT	CHANNEL ACTION	SETTING LIMIT
1.	High Containment Pressure (HI Level)	Safety Injection*	≤ 5 psig
2.	High Containment Pressure (HI-HI Level)	a. Containment Spray** b. Steam Line Isolation	≤ 25 psig
3.	Pressurizer Low Pressure	Safety Injection*	≥ 1700 psig
4.	High Differential Pressure Between any Steam Line and the Steam Line Header	Safety Injection*	≤ 150 psi
5.	High Steam Flow in 2/3 Steam Lines***	a. Safety Injection* b. Steam Line Isolation	≤ 40% (at zero load) of full steam flow ≤ 40% (at 20% load) of full steam flow ≤ 110% (at full load) of full steam flow
	Coincident with Low T_{avg} or Low Steam Line Pressure		≥ 541°F T_{avg} ≥ 600 psig steam line pressure
6.	Loss of Power		
SR 3.3.5.2.a	a. 480V Emerg. Bus Undervoltage (Loss of Voltage) Time Delay	~~Trip Normal Supply Breaker~~	328 Volts ± 10% ≤ 1 sec when voltage is reduced to zero

See 3.3.2

LA9

Supplement 4

TABLE 3.5-1 (Continued)

ENGINEERED SAFETY FEATURE SYSTEM INITIATION INSTRUMENT SETTING LIMITS

NO.	FUNCTIONAL UNIT	CHANNEL ACTION	SETTING LIMIT
[SR 3.3.5.2.b] 6. (Cont'd)	b. 480V Emerg. Bus Undervoltage (Degraded Voltage) Time Delay	Trip Normal Supply Breaker	430 Volts ± 4 Volts 10.0 Second Delay ± 0.5 sec.
7.	Containment Radioactivity High	Ventilation Isolation	The alarm is set with a method described in the ODCM.

LA9

See 3.3.6

* Initiates also containment isolation (Phase A), feedwater line isolation and starting of all containment fans.
** Initiates also containment isolation (Phase B).
*** Derived from equivalent WP measurements.

A17

Supplement 4

Specification 3.3.5

A1

Specification 3.3.6

3.5 INSTRUMENTATION SYSTEMS

3.5.1 Operational Safety Instrumentation

Applicability

Applies to plant operational safety instrumentation systems.

Objective

To provide for automatic initiation of the Engineered Safety Features in the event that principal process variable limits are exceeded, and to delineate the conditions of the plant instrumentation and safety circuits necessary to ensure reactor safety.

Specification

See 3.3.2

3.5.1.1 The Engineered Safety Features initiation instrumentation setting limits shall be as stated in Table 3.5-1.

ITS

See 3.3.1 3.3.2 3.3.3

3.5.1.2 For on-line testing or in the event of a subsystem instrumentation channel failure, plant operation at rated power shall be permitted to continue in accordance with Tables 3.5-2 through 3.5-5.

See 3.3.3

3.5.1.3 In the event the number of channels in service listed in Table 3.5-5 falls below the limits given in the column entitled Minimum Channels Operable, operation shall be limited according to the requirement shown in Column 2.

3.5.1.4 [Table 3.3.6-1] [Applicability] The containment ventilation isolation ~~function is only required when containment integrity is required.~~ instrumentation for each function in Table 3.3.6-1 shall be OPERABLE During Core Alterations, Movement of fuel in Containment

M40

3.5.1.5 In the event the number of operable channels of a particular functional unit listed in Tables 3.5-2, 3, or 4 falls below the limits given in the column entitled Total Number of Channels, operation shall be limited according to the requirement shown in Column 3.

See 3.3.1 3.3.2

Specification 3.3.6

A1

TABLE 3.5-4

ITS

ISOLATION FUNCTIONS INSTRUMENTATION LIMITING OPERATING CONDITIONS

A27

NO.	FUNCTIONAL UNIT			1 TOTAL NO OF CHANNELS	2 MINIMUM CHANNELS OPERABLE	3 OPERABLE ACTION IF COLUMN 1 OR 2 CANNOT BE MET	APPLICABLE CONDITIONS
1.	CONTAINMENT ISOLATION						See 3.2.2
	A.	Phase A					
		i.	Safety Injection	See Item No. 1 of Table 3.5-3 for all Safety Injection initiating functions and requirements			
		ii.	Manual	2	2	ACTION II	>200°F
	B.	Phase B		See Item No. 2 of Table 3.5-3 for all Containment Spray initiating functions and requirements			
	C.	Ventilation Isolation				Core Alterations and movement of irradiated fuel within Containment (M40)	
[T 3.3.6-1 (3a)]		i.	High Containment Activity. Gaseous	1	0	ACTION 15 A	During Containment Purge
[T 3.3.6-1 (3b)]		ii.	High Containment Activity. Particulate	1	0	ACTION 15	During Containment Purge (A27)
[T 3.3.6-1 (4)]		iii.	Phase A	See Item No. 1.A of Table 3.5-4 for all Phase A initiating functions and requirements			

Add 3.3.6 Action A

L46

Add Table 3.3.6-1 Function 2

M41

Amendment No. ~~85~~, 175

Supplement 4

ITS

TABLE 3.5-I (Continued)

ENGINEERED SAFETY FEATURE SYSTEM INITIATION INSTRUMENT SETTING LIMITS

NO.	FUNCTIONAL UNIT	CHANNEL ACTION	SETTING LIMIT
6. (Cont'd)	b. 480V Emerg. Bus Undervoltage (Degraded Voltage) Time Delay	Trip Normal Supply Breaker	430 Volts ± 4 Volts 10.0 Second Delay ± 0.5 sec.
[T3.3.6-1(3) & Note[d]] 7.	Containment Radioactivity High	Ventilation Isolation	~~The alarm is set~~ Trip setpoint shall be in accordance with a method described in the ODCM.

See 3.3.5

* Initiates also containment isolation (Phase A), feedwater line isolation and starting of all containment fans.

** Initiates also containment isolation (Phase B).

*** Derived from equivalent WP measurements.

See 3.3.5

Supplement 4

Specification 3.3.6

D1

Specification 3.3.6
3.3.7
A1

3.8 REFUELING

Applicability

Applies to operating limitations during refueling operations.

Objective

To minimize the possibility of an accident occurring during refueling operations that could affect public health and safety.

Specification

3.8.1 During refueling operations the following conditions shall be satisfied:

a. The equipment door and at least one door in the personnel air lock shall be properly closed. For those systems which provide a direct path from containment atmosphere to the outside atmosphere, all automatic containment isolation valves shall be operable or at least one valve shall be securely closed in each line penetrating the containment. See 3.9.3

b. The containment vent and purge system, including the radiation monitors which initiate isolation shall be tested and verified to be operable immediately prior to refueling operations. L31

c. Radiation levels in the containment and spent fuel storage areas shall be monitored continuously. See 3.9.2 + 3.9.3

d. Whenever core geometry is being changed, core subcritical neutron flux shall be continuously monitored by at least two source range neutron monitors, each with continuous visual indication in the control room and one with audible See 3.9.2

Add SR 3.3.6.1
SR 3.3.6.4
SR 3.3.6.6 (and Note)
SR 3.3.6.7
M42

M41
Add SR 3.3.6.2, SR 3.3.6.3, SR 3.3.6.5

Add Specification 3.3.7 M43

ITS

TABLE 3.4-1

AUXILIARY FEEDWATER FLOW AUTOMATIC INITATION*

place channel in trip - 6 hrs, or MODE 3 - 12 hrs, and MODE 4 - 18 hrs

M51 (3)

ITS	NO.	FUNCTIONAL UNIT	1 MINIMUM CHANNELS OPERABLE	2 MINIMUM DEGREE OF REDUNDANCY	3 OPERATOR ACTION IF CONDITIONS OF COLUMN 1 OR 2 CANNOT BE MET
[T 3.3.8-1(1)] [ACTION B]	1.	Steam Gen. Water Level-low-low a. Start Motor-Driven Pumps b. Start Turbine-Driven Pump	 2/Steam Generator 2/Steam Generator	 1/Steam Generator 1/Steam Generator	 Maintain Hot Shutdown Maintain Hot Shutdown
[T 3.3.8-1(4)]	2.	Undervoltage-4KV Busses 1 & 4 Start Turbine-Driven Pump (15 Second Time Delay Pickup)	2 Per Bus	0	Note 1
[T 3.3.8-1(2)]	3.	S.I. Start Motor-Driven Pumps	See Table 3.5-3, Item No.1		
[T 3.3.8-1(3)]	4.	Station Blackout Start Motor-Driven Pumps (40 Second Time Delay Prior to Starting MD AFW Pumps on Blackout Sequence)	2 Per Bus	0	Note 2
[T 3.3.8-1(5)]	5.	Trip of Main Feedwater Pumps Start Motor-Driven Pumps	1/Pump	0	Note 2

L32 A27

[MODES 1, 2, 3]
[MODES 1, 2]

* This table is applicable whenever the RCS is > 350°F except Item 5. Item 5 is applicable only when the RCS is at normal operating temperature and the reactor is critical.

Note 1: 4KV Busses 1, 2, and 4 each have two undervoltage relays. One relay on each of the three busses provides an input to the reactor trip logic. Both relays on Busses 1 and 4 provide inputs to the SD AFW pump start logic. If the undervoltage relay on Busses 1 or 4 that provides the input to the reactor trip logic fails, follow the requirements of Table 3.5-2 Item 14 in addition to the following. If either 4KV undervoltage relay on Busses 1 or 4 fails, within 6 hours insert the equivalent of an undervoltage signal from the affected relay in the SD AFW pump start circuit and repair the affected relay within 7 days. If the affected relay is not repaired in the 7 days, then commence a normal plant shutdown to hot standby. (MODE 3 in 12 hours, MODE 4 in 18 hours)

[ACTION B] A21 L33 (6) or M48 M48

Note 2: Restore the inoperable channel to operable status within 48 hours. If the inoperable chanel is not restored to an operable status within 48 hours, then commence a normal plant shutdown and cooldown to ≤ 350°F. (MODE 3 in 54 hrs.) (MODE 4 in 60 hrs)

[ACTION D] [ACTION C] M44

ITS

TABLE 4.8-1

AUXILIARY FEEDWATER SYSTEM AUTOMATIC INITIATION
SURVEILLANCE REQUIREMENTS

		FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST
		AUXILIARY FEEDWATER			
[T3.3.8-1(1)]	a.	Steam Generator Water Level--Low-Low	N.A [SR3.3.8.1]	[SR3.3.8.4] See Table 4.1-1, Item 11	[SR3.3.8.2]
[T3.3.8-1(4)]	b.	Undervoltage - 4 Kv busses 1 and 4	N.A.	R [SR3.3.8.4]	R [SR3.3.8.3]
[T3.3.8-1(2)]	c.	S. I.	(all Safety Injection surveillance requirements)		
[T3.3.8-1(3)]	d.	Station Blackout - E1 and E2 busses	N.A.	N.A [SR3.3.8.4]	R [SR3.3.8.3]
[T3.3.8-1(5)]	e.	Trip of Main Feedwater Pumps	N.A.	N.A.	R [SR3.3.8.3]

A22

L16

L48

A22

L48

Add Note to SR 3.3.8.3

L47

D1

Specification 3.3.8

Specification 4.3

ITS

[4.3.1.1] 5.4.2.2 SPENT FUEL STORAGE PIT

which includes an allowance for uncertainties (M3) (A1)

A combination of nominal assembly spacing, neutron absorber material between the assemblies, and restrictions on fuel design, integral burnable absorber content, reconstitution, and storage is required to assure that k_{eff} is maintained less than 0.95 when the spent fuel storage pit is flooded with unborated water based on a maximum assembly planar enrichment of ~~4.95 ± 0.05 (4.95 nominal)~~ weight percent U_{235}. Fuel assemblies with maximum planar enrichments greater than 4.55 + 0.05 (4.55 nominal) weight percent U_{235} have requirements for minimum integral burnable absorber content.[2] (LA3) (5.0) (A4)

[4.3.1.1.b]
[4.3.1.1.a]
[4.3.1.1.e]

5.4.3 BORON CONCENTRATION - SPENT FUEL STORAGE PIT

The spent fuel storage pit is filled with borated water at a concentration of greater than or equal to 1500 ppm during refueling operations or new fuel movement in the spent fuel storage pit. This minimum boron concentration ensures subcriticality under worst case design events. (see 3.7.13)

[4.3.3] 5.4.4 STORAGE CAPACITY - SPENT FUEL STORAGE PIT

The spent fuel storage pit provides a storage location for 544 fuel assemblies.

which includes an allowance for uncertainties (A4)

Add 4.3.1.1.c, 4.3.1.1.d (M1)

Reference

~~(1) FSAR Section 9.1~~

~~(2) EMF-94-113, "H. B. Robinson New and Spent Fuel Criticality Analysis," July 1994, Siemens Power Corporation~~ (A3)

Specification 5.1

ITS

A1

[5.0] 6.0 ADMINISTRATIVE CONTROLS

[5.1] 6.1 RESPONSIBILITY

[5.1.1] 6.1.1 The ~~General~~ plant Manager ~~- Robinson Plant~~ shall be responsible for overall facility operation and shall delegate in writing the succession to this responsibility during his absence. LA21

Add 5.1.2 — M14

Supplement 4

Specification 5.2

ITS

A1

[5.2] 5.2 ORGANIZATION

[5.2.1] 6.2.1 An onsite and an offsite organization shall be established for unit operation and corporate management. The onsite and offsite organization shall include the positions for activities affecting the safety of the nuclear power plant.

[5.2.1.a] a) Lines of authority, responsibility and communication shall be established and defined from the highest management levels through intermediate levels to and including all operating organization positions. Those relationships shall be documented and updated, as appropriate, in the form of organizational charts. These organizational charts will be documented in the FSAR and updated in accordance with 10CFR50.71(e). A3

[5.2.1.c] b) The Senior Vice President - Nuclear Generation shall have corporate responsibility for overall plant nuclear safety. This individual shall take any measures needed to ensure acceptable performance of the staff in operating, maintaining, and providing technical support in the plant so that continued nuclear safety is assured. a specific corporate officer LA21

[5.2.1.b] c) The General Manager - Robinson Plant shall be responsible for overall unit safe operation and shall have control over those onsite resources necessary for safe operation and maintenance of the plant. plant

[5.2.1.d] d) Although the individuals who train the operating staff and those who carry out the quality assurance functions may report to the appropriate manager onsite, they shall have sufficient organizational freedom to be independent from operating pressures. radiation control, or perform A4

e) Although health physics individuals may report to any appropriate manager onsite, for matters relating to radiological health and safety of employees and the public, the manager responsible for health physics shall have direct access to that onsite individual. LA2

radiation control A37

Supplement 4

A1

ITS

having responsibility for overall unit management. Health physics personnel shall have the authority to cease any work activity when worker safety is jeopardized or in the event of unnecessary personnel radiation exposures.

LA2

6.2.2 Definitions

Personnel reporting to the General Manager - Robinson Plant shall be identified in Section 6 of the Technical Specifications as the plant staff.

unit

Facility Staff

[5.2.2]

unit staff

include

6.2.3 The Robinson Nuclear Project organization shall be subject to the following:

[5.2.2.a]

MODES 1, 2, 3 and 4

A30

a) The shift complement during hot operations shall consist of at least one Shift Foreman holding a Senior Reactor Operator's License, one Senior Control Operator holding a Senior Reactor Operator's License, two Control Operators each holding a Reactor Operator's License, two additional shift members, and one Shift Technical Advisor. If an individual that holds a Senior Reactor Operator's License also meets the Shift Technical Advisor requirements, that individual may act in both capacities.

A5

[5.2.2.g]

[5.2.2.e]

b) Administrative procedures shall be developed and implemented to limit the working hours of unit staff who perform safety-related functions (e.g., Licensed Senior Operators, Licensed Operators, health physicists, auxiliary operators, and key maintenance personnel).

radiation control personnel

A37

the Shift Technical Advisor (STA) shall provide advisory technical support to the shift superintendent with regard to the safe operation of the unit.

A30

LA21

Amendment No. ~~84~~, ~~100~~, ~~120~~, ~~138~~, 144

Supplement 4

(A1)

ITS

[5.2.2.b] d) At least one licensed operator shall be in the control room when fuel is in the reactor. | (M1)

[5.2.2.b] e) At least two licensed operators (at least one is an SRO) shall be present in the control room during reactor start-up, scheduled reactor shutdown, and during recovery from reactor trips. (when in MODES 1, 2, 3 and 4) |

[5.2.2.d] f) An individual qualified in (as a) radiation protection procedures (control technician) shall be on site when fuel is in the reactor. | (LA2)

g) ALL CORE ALTERATIONS after the initial fuel loading shall be directly supervised by either a licensed Senior Reactor Operator or Senior Reactor Operator limited to fuel handling who has no other concurrent responsibilities during this operation. | (A5)

| (L2)

[5.2.2.c] h) The shift complement may be one less than the minimum requirement of Section 6.2.3.a and 6.2.3.b for a period of time not to exceed 2 hours in order to accommodate unexpected absence of on-duty shift members provided immediate action is taken to restore the shift complement to within the minimum requirements of Section 6.2.3.a and 6.2.3.b. This provision does not permit any shift member position to be unmanned upon shift change due to an oncoming shift member being late or absent. (LA3)

(10 CFR 50.54(m)(2)(i) and Specifications 5.2.2.a and 5.2.2.g)

The position may be vacant for not more than 2 hours, in order to provide for unexpected absence, provided immediate action is taken to fill the required position. (L1)

Amendment No. ~~92~~, ~~105~~, ~~114~~, ~~120~~, ~~142~~, 144

Supplement 4

ITS

6.5 REVIEW AND AUDIT (A1)

6.5.1 The license organization's review and approval process shall assure that the nuclear safety of the facility is maintained.

6.5.1.1 Procedures, Tests, and Experiments (A35)

[5.4.1] 6.5.1.1.1 Written procedures shall be established, implemented, and maintained covering the activities referenced below:

[5.4.1.a] a. The applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, Rev. 2, February 1978.

b. Refueling operations.

c. Surveillance and test activities of safety-related equipment. (A8)

d. Security Plan implementing procedures.

e. Emergency Plan implementing procedures. (A10)

[5.4.1.d] f. Fire Protection Program implementing procedures.

g. Radiological Environmental Monitoring Program implementing procedures.

h. Offsite Dose Calculation Manual implementing procedures. (A11)

i. Process Control Program implementation procedure. (LA17)

[5.4.1.c] j. Quality Assurance Program for effluent and environmental monitoring (using the guidance in Regulatory Guide 4.15, December 1977). (LA4)

Add 5.4.1.b (M2)

Add 5.4.1.e (M3)

Specification 5.5

A1

I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in NRC Regulatory Guide 1.109, Revision 1, October 1977.

See 1.1

1.15 PROCESS CONTROL PROGRAM (PCP)

The Process Control Program (PCP) shall contain the current formulas, sampling, analyses, tests and determinations to be made to ensure that the processing and packaging of solid radioactive wastes based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure compliance with 10 CFR Part 20, 10 CFR Part 71, and Federal and State regulations and other requirements governing the disposal of the radioactive waste.

LA 17

1.16 SOLIDIFICATION

Solidification shall be the conversion of wet radioactive wastes into a form that meets shipping and burial ground requirements.

1.17 PURGE - PURGING

Purge or purging is the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration or other operating condition, in such a manner that replacement air or gas is required to purify the confinement.

See 1.1

1.18 VENTING

Venting is the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration or other operating condition, in such a manner that replacement air or gas is not provided or required during venting. Vent, used in system names, does not imply a venting process.

Add 5.5.2 — A22

5.5.2 — M13

Add 5.5.3 — A22

Add 5.5.4 — M11

Add 5.5.5 — M5

ITS

Specification

[5.5.9.d.5]

5.5.1.b (A1)

Unscheduled inspections shall be conducted in accordance with Specification 4.2.5.1.1 on any steam generator with primary-to-secondary tube leakage (not including leaks originating from tube-to-tube sheet welds) exceeding Specification 3.1.5.3 3.4.13

All steam generators shall be inspected before returning to power in the event of a seismic occurrence greater than an operating basis earthquake, a LOCA requiring actuation of engineering safeguards, or a main steam line or feedwater line break.

4.2.1.1.5 [5.5.9.e]

Acceptance Limits

Definitions:

Imperfection is an exception to the dimension, finish, or contour of a tube from that required by fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections.

Degradation means a service induced cracking, wastage, wear, or general corrosion occurring on either inside or outside of a tube.

Degraded Tube is a tube that contains imperfections caused by degradation equal to or greater than 20% of the nominal tube wall thickness.

Defect is an imperfection of such severity that it exceeds the plugging limit. A tube containing a defect is defective.

Plugging Limit is the imperfection depth beyond which a degraded tube must be removed from service by plugging, because the tube may become defective prior to the next scheduled inspection of that tube. The plugging limit is 47% of the nominal tube wall thickness if the next inspection interval of that tube is 12 months, and a 2% reduction in the plugging limit for each 12 month period until the next inspection of the inspected steam generator.

4.2.1.8 [5.5.9.f]

Corrective Measures

All tubes that leak or are determined to have degradation exceeding the plugging limit shall be plugged prior to return to power.

4.2.1.3

Reports

1. After each inservice examination, the number of tubes plugged in each steam generator shall be reported to the Commission as a Special Report within 14 days after completion of tube plugging.

2. The complete results of the steam generator tube inservice inspection shall be included in the Operating Report for the period in which the inspection was completed.

See 5.6

Add 5.5.10 (A22)

Supplement 4

Specification 5.5

(A1)

ITS

[5.5.12]

Objective

To ascertain that the concentration of hydrogen and oxygen in the Waste Gas Decay Tanks is maintained as low as reasonably achievable and within allowable limits.

Specification

4.20.4.1 The concentration of hydrogen and oxygen in the Waste Gas Decay Tanks shall be determined to be within the limits specified in Specification 3.16.4.1 by monitoring the waste gases in the Waste Gas Decay Tanks with the hydrogen and oxygen monitors or monitoring procedures required operable by Table 3.5-7 of Specification 3.5.3.1.

(LA10)

4.20.5 Waste Gas Decay Tanks (Radioactive Material)

Applicability

Applies to the Waste Gas Decay Tanks.

Objective

To ascertain that the quantity of radioactive material in the Waste Gas Decay Tanks is maintained as low as reasonably achievable and within allowable limits.

Specification

4.20.5.1 With the primary coolant activity ≥ 100 μCi/ml the quantity of radioactive material contained in each Waste Gas Decay Tank shall be determined to be within the limit specified in Specification 3.16.5.1 once per 24 hours when radioactive materials are being added to the tank.

Add 5.5.13 (M15)

Add 5.5.14 (M6)

Add 5.5.15 (M7)

Amendment No. 85

Supplement 4

ITS

(A1)

Startup reports shall be submitted within (1) 90 days following completion of the startup test program, (2) 90 days following resumption of commercial power operation, or (3) 9 months following initial criticality, whichever is earliest. If the startup report does not cover all three events (i.e., initial criticality, completion of startup test program, and resumption of commercial power operation), supplementary reports shall be submitted at least every three months until all three events have been completed. (LA13)

6.9.1.2 Annual Reports (L5)

Annual Reports covering the activities of the unit as described below for the previous calendar year shall be submitted prior to March 1 of each year. The initial report shall be submitted prior to March 1 of the year following initial criticality.

(A36) Collective deep dose equivalent (reported in person-rem)

Reports required on an annual basis shall include:

[5.6.1]

1. A tabulation on an annual basis of the number of station, utility, and other personnel (including contractors) receiving [redacted] greater than 100 mrem/yr and their associated [redacted] according to work and job functions (e.g., reactor operations and surveillance, inservice inspection, [redacted] maintenance, special maintenance (describe maintenance), waste processing, and refueling).* The dose assignments to various duty functions may be estimated based on pocket dosimeter, thermoluminescent dosimeter (TLD), or film badge measurements. Small exposures totaling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total [redacted] received from external sources should be assigned to specific major work functions.

an annual deep dose equivalent

(A31)

deep dose equivalent

(L5) This report shall be submitted by April 30 of each year.

(A36)

2206

* This tabulation supplements the requirements of § 20.407 of 10 CFR Part 20.

Supplement 4

Specification 5.6

ITS

A1

6.9.2 Deleted

6.9.3 Special Reports

6.9.3.1 Special reports shall be submitted to the NRC within the time period specified for each report. These reports shall be submitted covering the activities identified below pursuant to the requirements of the applicable reference specification:

	Area	Reference	Submittal Date
a)	Containment Leak Rate Testing	4.4	Upon completion of each test. (See 5.5.16)
b) [5.6.7]	Containment Sample Tendon Surveillance	4.4	~~Upon~~ within 6 months of completion of the inspection at 25 years of operation. (A34)
c)	Post-Operational Containment Structural Test	4.4	Upon completion of the test at 20 years of operation. (See 5.5.16)
d)	DELETED		
e)	Overpressure Protection System Operation	3.1.2.1.e	Within 30 days of operation. (See 3.4.12)
f)	Auxiliary Feedwater Pump	3.4	Within 30 days after becoming inoperable. (See 3.7.4)

ITS [5.6.8]

A.1

(e) Unscheduled inspections shall be conducted in accordance with Specification 4.2.5.1.2 on any steam generator with primary-to-secondary tube leakage (not including leaks originating from tube-to-tube sheet welds) exceeding Specification 3.1.5.3.

All steam generators shall be inspected before returning to power in the event of a seismic occurrence greater than an operating basis earthquake, a LOCA requiring actuation of engineering safeguards, or a main steam line or feedwater line break.

4.2.1.1.5 Acceptance Limits

See 5.5

Definitions:

Imperfection is an exception to the dimension, finish, or contour of a tube from that required by fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections.

Degradation means a service induced cracking, wastage, wear, or general corrosion occurring on either inside or outside of a tube.

Degraded Tube is a tube that contains imperfections caused by degradation equal to or greater than 20% of the nominal tube wall thickness.

Defect is an imperfection of such severity that it exceeds the plugging limit. A tube containing a defect is defective.

Plugging Limit is the imperfection depth beyond which a degraded tube must be removed from service by plugging, because the tube may become defective prior to the next scheduled inspection of that tube. The plugging limit is 47% of the nominal tube wall thickness if the next inspection interval of that tube is 12 months, and a 2% reduction in the plugging limit for each 12 month period until the next inspection of the inspected steam generator.

4.2.1.2 Corrective Measures

All tubes that leak or are determined to have degradation exceeding the plugging limit shall be plugged prior to return to power.

[5.6.8] 4.2.1.3 Reports

a. (1) After each inservice examination, the number of tubes plugged in each steam generator shall be reported to the Commission as a Special Report within 14 days after completion of tube plugging.

b. (2) The complete results of the steam generator tube inservice inspection shall be included in the Operating Report for the period ~~on which~~ beginning after the inspection ~~was~~ is completed. L9

Specification 5.7

ITS (A1)

[5.7] 6.13 HIGH RADIATION AREA

[5.7.1] 6.13.1 In lieu of the "control device" or "alarm signal" required by paragraph 20.1601(a) of 10 CFR 20, each High Radiation Area in which the intensity of radiation is 1000 mRem/hr or less shall be barricaded and consipcuously posted by requiring issuance of a Radiation Work Permit (RWP).* Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

a. A radiation monitoring device which continuously indicates the radiation dose rate in the area.

b. A radiation monitoring device provided for each individual which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate levels in the area have been established and personnel have been made knowledgeable of them. (LA21)

c. An indvidual qualified ~~in~~ [as a] radiation ~~protection procedures~~ [control technician] who is equipped with a radiation dose monitoring device. This individual shall be responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the Radiation Control Supervisor in the Radiation Work Permit.

[5.7.2] 6.13.2 The requirements of ~~6.13.1~~ [5.7.1] above shall apply to each high radiation area in which the intensity of radiation is greater than 1000 mRem/hr at 30 centimeters (12 inches) from the radiation source or from any surface penetrated by the radiation, but less than 500 rads/hour at 1 meter from the radiation source or from any surface penetrated by the radiation. In addition, locked doors shall be provided to prevent ~~unauthorized~~ [inadvertent] (A28) entry into such areas and the keys shall be maintained under the administrative control of the ~~Operations Shift Supervisor~~ [Shift Superintendent] (LA21) on duty and/or the Radiation Control Supervisor. Entrance there to shall also be controlled by requiring issuance of a Radiation Work Permit. The footnote for Section ~~6.13.1~~ [5.7.1] is not applicable to each high radiation area in which the intensity of radiation is greater than 1000 mRem/hr.

---

* [redacted] [Radiation control] (A37) personnel or personnel escorted by [redacted] personnel shall be exempt from RWP issuance rquirement during the performance of their assigned duties within the RCA, provided they comply with approved radiation protection procedures for entry into high radiation areas.

Supplement 4

TABLE 4.1-1 (Continued)

MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TEST OF INSTRUMENT CHANNELS

	Channel Description	Check	Calibrate	Test	Remarks
	b. Main Vent Stack				
	High Range	D	R	Q	
	Mid Range	D	R	Q	
	c. Spent Fuel Pit Lower Level				
	High Range	D	R	Q	
39.	Steam/Feedwater Flow Mismatch	N.A.	R	M	
40.	Low Steam Generator Water Level	N.A.	R	M	
41.	CV Level (Wide Range)+	M	R	R	
42.	CV Pressure (Wide Range)++	M	R	R	
43.	CV Hydrogen Monitor+++	M	R	R	
44.	CV High Range Radiation Monitor++++	M	R#	R	
45.	RCS High Point Vents	N.A.	N.A.	R	
46.	Manual Reactor Trip	N.A.	N.A.	R(1)	(1) The manual reactor trip operational test shall verify the independent operability of the manual shunt trip circuit and the manual UV trip circuit on the reactor trip breakers. The test shall also verify the operability of the UV trip circuit on the bypass breakers.
47.	Reactor Trip Bypass Breakers	N.A.	N.A.	M(3),R(4)	(3) Remote manual UV trip required only when placing the bypass breaker in service. (4) Perform UV trip from protection system.

See ITS 3.3.1

(R1)

Relocated Specifications

ITS

Specification 3.8.1

(A1)

4.6 EMERGENCY POWER SYSTEM PERIODIC TESTS

Applicability

Applies to periodic testing and surveillance requirements of the emergency power system

Objective

To verify that the emergency power system will respond promptly and properly when required

Specification

(M25)

The following tests and surveillance shall be performed as stated:

4.6.1 Diesel Generators

(Verify) from standby conditions and achieves steady state voltage ≥ 467V and ≤ 493V and frequency ≥ 59.8Hz and ≤ 61.2Hz

4.6.1.1 On a monthly basis, each diesel generator [redacted] start, followed by manual synchronization with other power sources, and verification that each diesel generator is loaded and operates for ≥ 60 minutes at a load ≥ 2350 kW and ≤ 2500 kW

[SR 3.8.1.2]
[SR 3.8.1.3]

an actual or (A7)

4.6.1.2 Automatic start of each diesel generator, load shedding and restoration to operation of particular vital equipment, initiated by a simulated loss of all normal A-C station service power supplies together with a [redacted] safety injection signal. This test will be conducted [redacted] to assure that the diesel generator will start and assume required load within 58 seconds after the initial starting signal

[SR 3.8.1.14] (18 Months) (M5) (Insert 3.8.1-15)

4.6.1.3 Each diesel generator shall be inspected at each refueling. The diesel protective bypasses listed in Specification 3.7.1.b shall be demonstrated to be operable by simulating a trip signal to each of the trip devices that is bypassed and observing that the diesel does not receive a trip signal

[SR 3.8.1.10] (Verify) (d) (automatic trips are) except engine overspeed (LA4) (LA1) (LA3) (M19)

4.6.1.4 The following diesel generator load limits shall be observed

a. The continuous load rating for the diesel generator is 2500 kW. Continuous operation above this limit shall not be permitted, except as defined within Technical Specification 4.6.1.4.b.

b. The short-term overload rating of the diesel generator is 2750 kW. Operation at this load shall not exceed 2 hours in any 24 hour period. Operation above the short-term overload rating shall not be permitted.

(LA5)

Add SR 3.8.1.1
SR 3.8.1.4
SR 3.8.1.5
SR 3.8.1.6
SR 3.8.1.7
SR 3.8.1.8
SR 3.8.1.9
SR 3.8.1.10
SR 3.8.1.13
SR 3.8.1.14

Add SR 3.8.1.2, Notes 1, 2
SR 3.8.1.3, Notes 1, 2, 3, 4
SR 3.8.1.4, Notes 1, 2
(A8)

Add SR 3.8.1.16
SR 3.8.1.17
(M6)

Supplement 4

Specification 3.8.3

(A1)

ITS

3.7 AUXILIARY ELECTRICAL SYSTEMS

Applicability

Applies to the availability of electrical power for the operation of plant auxiliaries.

Objective

To define those conditions of electrical power availability necessary (1) to provide for safe reactor operation, and (2) to provide for the continuing availability of engineered safeguards.

Specification

MODES 1, 2, 3 + 4 ← (M1)

[Applicability] 3.7.1 The reactor shall not be made critical without: ← see 3.8.1

a) The 110 KV-4160 Volt start-up transformer in service; — See 3.8.1

b) 480-Volt buses E1 and E2 energized; — see 3.8.1

c) 4160-Volt buses 2 and 3 energized;

d) Two diesel generators OPERABLE with a minimum supply of 10,000 gallons of fuel oil available to the diesel generators from the Unit 2 diesel generator fuel oil storage tank and an additional 15,000 gallons available to the diesel generators from either the Unit 1 I-C turbine fuel oil storage tanks or a combination of the Unit 1 I-C turbine fuel oil storage tanks and the Unit 2 diesel generator fuel oil storage tank, and with the following protective trips for each diesel generator bypassed:

1) Low lube oil pressure
2) Low coolant pressure
3) High coolant temperature
4) High crankcase pressure
5) Start failure - Governor Shutdown

[SR 3.8.3.1] The stored diesel ... starting air subsystem ... shall be within limits for each DG. ← (M) ; (A9) ; see 3.8.1

Add Actions Note ← (A10)

Add RA A.1
RA B.1 ← (L2)

Add RA C.1 ← (M2B)

Add RA D.1 ← (M8)

Add RA E.1 ← (A11)

Specification 3.8.3

A1

TABLE 4.1-3

FREQUENCIES FOR EQUIPMENT TESTS

175

		Check	Frequency	Maximum Time Between Tests	
1.	Control Rods	Rod drop times of all full length rods	Each refueling shutdown	NA*	See 3.1.4
2.	Control Rod	Partial movement of all full length rods	Every 2 weeks during reactor critical operations	20 days	
3.	Pressurizer Safety Valves	Set point	Each refueling shutdown	NA	See 3.4.10
4.	Main Steam Safety Valves	Verify each required MSSV lift setpoint per Table 4.1-4 in accordance with the Inservice Testing Program. Following testing, lift setting shall be within +/- 1%.	In accordance with the Inservice Testing Program	NA	See 3.7.1
5.	Containment Isolation Trip	Functioning	Each refueling shutdown	NA	See 3.3.2, 3.6.3
6.	Refueling System Interlocks	Functioning	Prior to each refueling shutdown	NA	See 3.9.1
7.	Service Water System	Functioning	Each refueling shutdown	NA	See 3.7.7
~~8.~~	~~DELETED~~				
9.	Primary System Leakage	Evaluate	Daily when reactor coolant system is above cold shutdown condition	NA	See 3.4.13
[SR 3.8.3.1] 10.	Diesel Fuel Supply	~~Fuel Inventory~~	~~Weekly~~ 7 days	~~10 days~~	
~~11.~~	~~DELETED~~				
12.	Turbine Steam Stop, Control, Reheat Stop, and Interceptor Valves	Closure	Quarterly during power operation and prior to startup	115 days	See 3.7.1

Verify a minimum supply of 19,000 gallons of diesel fuel oil available to the DGs from the Unit 2 fuel oil storage tank AND a total of 34,000 gallons available to the DGs from the combination of the Unit 1 I-C Turbine fuel oil storage tanks and the Unit 2 DG fuel oil storage tank

 Amendment No. 142, 155, 164, 171

Supplement 4

Specification 3.8.6 (A1)

ITS

4.6.1.5 At each refueling interval each diesel generator shall be tested by manually initiated start followed by manual synchronization with other power sources and verification that each diesel generator is loaded and operates for ≥ 24 hours During two hours of this test the load shall be maintained between 2650 kw and 2750 kW* During the remaining 22 hours of this test the load shall be maintained between 2400 kW and 2500 kW* The power factor shall be maintained between 0 8 and 0 9 during the entire test

See 3.8.

4.6.2 Diesel Fuel Tanks

A minimum fuel oil inventory sufficient to ensure 19.000 gallons available to the diesel generators shall be maintained at all times in the Unit 2 diesel generator fuel oil storage tank and an additional 15.000 gallons available to the diesel generators shall be maintained at all times in either the Unit 1 I-C turbine fuel oil storage tanks or a combination of the Unit 1 I-C turbine fuel oil storage tanks and the Unit 2 diesel generator fuel oil storage tank

See 3.8.3

4.6.3 Station Batteries — Verify battery cell parameters meet Table 3.8.6-1 Category A Limits (M26)

[SR 3.8.6.1] 4.6.3.1 The voltage and temperature of a pilot cell in each battery shall be measured and recorded daily (5 days/week) — 7 days (L6)

[SR 3.8.6.1] [SR 3.8.6.2] 4.6.3.2 The specific gravity and voltage to the nearest 0.01 volt, the temperature reading of every fifth cell, the height of electrolyte and the amount of water added to each cell shall be measured and recorded monthly (LA7) — 7 days for SR 3.8.6.1 (M26) — 92 days for SR 3.8.6.2 (L11)

4.6.3.3 Each battery shall be subjected to an equalizing charge annually The requirements in 4.6.3.2 above shall be performed after each equalizing charge (L7)

4.6.3.4 At each time data is recorded, new data shall be compared with old to detect signs of abuse or deterioration (LA7)

* The minimum and maximum kW values are included as guidance to avoid overloading of the engine Loads in excess of this range for special testing under direct monitoring of the manufacturer or momentary variations due to changing bus loads shall not invalidate this test

See 3.8.1

Add LCO Applicability (M15)

Add 2nd + 3rd Freq for SR 3.8.6.2 (M15)

Add SR 3.8.6.3 (L10) (M29)

Add RA A.1, A.2, A.3 (L3)

PAGE 4.6 2a HAS BEEN DELETED

Add RA B.1 (A22)

ITS

Specification 3.8.9 (A1)

(M27) TRAIN A and TRAIN B AC and AC Instrument Bus electrical power

[LCO 3.8.9]

e) Station batteries A and B, a battery charger "A or S-1 and B or S" on each battery and their DC distribution systems are operable. (A) shall be

3.7.2 During power operation the following components may be inoperable:

a) Provided both diesel generators are operable, power operation may continue with the start-up transformer out of service for 24 hours without reporting to the NRC.

b) Power operation may continue with the start-up transformer out of service beyond 24 hours provided both diesel generators are operable and the reporting requirements of Specification 6.6.1 are followed.

c) Power operation may continue if the start-up transformer and one diesel generator is inoperable provided the reporting requirements of Specification 6.6.1 and 6.6.2 are followed.

d) ------------------------------NOTES------------------------------

1. For the purpose of operability testing, the diesel generator start may be preceded by an engine pre-lube period and followed by a warmup period. The diesel generator is not required to be loaded. The diesel generator shall achieve steady state voltage and frequency during the test.

2. The diesel generator may be inoperable for a total of two hours per test inclusive of the 24 hours allowed time in 2) or 3) below.

With either diesel generator inoperable, restore inoperable diesel generator to service within 7 days and perform 1) AND EITHER 2) OR 3) below:

1) Verify the availability of the required off-site power source within one hour and once per twelve hours thereafter.

AND

2) Determine that the remaining operable diesel generator is not inoperable due to common cause failure within 24 hours; AND if the inoperable diesel generator is not restored prior to 72 hours, verify the remaining operable diesel generator starts within the next 24 hours.

OR

3) Verify the remaining operable diesel generator starts within 24 hours.

See 3.8.

(L5) Add RA A.1

(M20) Add RA B.1, RA C.1 (A23)

(A18) Add RA D.1, RA E.1

(M20) (A23) Add RA F.1, RA F.2

(A19) Add RA G.1

Supplement 4

Specification 3.8.9

ITS

A1

TABLE 4.1-3 (Continued)
FREQUENCIES FOR EQUIPMENT TESTS

	Check	Frequency	Maximum Time Between Test
		2. Whenever integrity of a pressure isolation valve listed in Table 3.1-1 cannot be demonstrated, the integrity of the remaining valve in each high pressure line having a leaking valve shall be determined and recorded daily. In addition, the position of the other closed valve located in the high pressure piping shall be recorded daily.	← See 3.4
18. Automatic Bus Transfers	~~Test thermal and magnetic trip elements of respective molded case circuit breakers~~	~~Each refueling shutdown~~ 18 Months	NA
[SR 3.8.9.2] a) Auxiliary Feedwater Header Discharge Valve to Steam Generator A, V2-16A	Verify capability of the two molded case circuit breakers to trip on overcurrent (L9)		
[SR 3.8.9.3] b) Turbine Building, Cooling Water Isolation Valve, V6-16C			

Add SR 3.8.9.1 ← M22