Entergy

Entergy Operations Inc.
River Bend Station
5485 U. S. Highway 61N
St. Francisville, LA 70775
Tel 225 381 4157
Fax 225 381 4139
www.entergy.com

N. Todd Brumfield
Director - Regulatory & Performance Improvement
nbrumfi@entergy.com

RBG-47603

August 11, 2015

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Subject: Revisions to the Technical Requirements Manual and the Technical Specification Bases
River Bend Station - Unit 1
Docket No. 50-458
License No. NPF-47

RBF1-15-0130

Dear Sir or Madam:

Pursuant to 10 CFR 50.71(e), Entergy Operations, Inc., (EOI) herein submits changes to the River Bend Station (RBS) Technical Requirements Manual (TRM). The revised pages cover the changes made during the period of July 26, 2013, through August 7, 2015. This includes TRM revisions 137 through 141.

Pursuant to RBS Technical Specification (TS) 5.5.11, revised pages for the Technical Specification (TS) Bases pages are included. The revised pages reflect the changes made during the same period stated above. This includes TS Bases revisions 156 through 161.

As required by 10CFR50.71(e), the affirmation below certifies that the information in this submittal accurately reflects changes made since the previous submittal, as necessary to represent information and analyses submitted or prepared pursuant to NRC requirements.

If you have any questions, please call Joseph A. Clark at 225-381-4177. I declare under penalty of perjury that the foregoing is true and correct. Executed on August 11, 2015.

Sincerely,

N. Todd Brumfield

NTB / dhw

A001
NRR

Enclosures:
1. Technical Requirements Manual Revision Pages
2. Technical Specifications Bases Revision Pages

cc: U. S. Nuclear Regulatory Commission
Region IV
1600 E. Lamar Blvd.
Arlington, TX 76011-4125

Department of Environmental Quality
Office of Environmental Compliance
Radiological Emergency Planning and Response Section
Ji Young Wiley
P.O. Box 4312
Baton Rouge, LA 70821-4312

Central Records Clerk
Public Utility Commission of Texas
Austin, TX

(w/o enclosures)

Senior Resident Inspector
River Bend Station

Mr. Alan B. Wang
U. S. Nuclear Regulatory Commission
Washington, DC

Enclosure 1
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Technical Requirements Manual Revision Pages

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TR 5.0 ADMINISTRATIVE CONTROLS

TR 5.1 Responsibility

TR 5.1.1 (Not used)

TR 5.1.2 A management directive restating the Technical Specification 5.1.2 Control Room command function requirements signed by the Site Vice President-RBS shall be issued to all station personnel on an annual basis.

TR 5.2 Organization

TR 5.2.1 Plant Specific Titles

The following are the plant specific titles for the personnel fulfilling responsibilities of positions delineated in Technical Specifications:

a. The corporate executive responsible for overall plant nuclear safety is the Site Vice President.

b. The Plant manager is the General Manager, Plant Operations.

c. The shift superintendent is the Manager, Shift Operations.

d. A non-licensed operator is an Auxiliary Operator.

e. The operations manager is the Senior Manager, Operations.

f. The operations middle managers are the Manager, Operations - Shift and Manager, Operations - Support.

g. The radiation protection manager is the Manager - Radiation Protection.

h. A health physics technician is an individual qualified as a Radiation Protection Technician.

i. Health Physics supervision is Radiation Protection personnel, Supervisor and above.

TABLE 5.2.2-1

MINIMUM SHIFT CREW COMPOSITION

POSITION	NUMBER OF INDIVIDUALS REQUIRED TO FILL POSITION	
	MODES 1, 2, or 3	MODES 4 or 5
OSM	1	1
SRO	1	None
RO	2	1
AO	2	1
STA*	1	None

TABLE NOTATION

OSM - Manager Shift Operations with a Senior Operator license
SRO - Individual with a Senior Operator license
RO - Individual with an Operator license
AO - Auxiliary Operator
STA - Shift Technical Advisor

* The Shift Technical Advisor (STA) position may be filled by an on-shift shift manager (OSM) or Senior Reactor Operator (SRO) provided the individual meets the STA qualifications for the dual role position specified below and five (5) licensed operators are on shift.

For the dual role position, the Shift Technical Advisor shall have a bachelor's degree in engineering, engineering technology, or physical science from an accredited institution, including course work in the mathematical or engineering sciences, or a professional engineer's license obtained by successful completion of the PE examination and shall have received all of the training for the normal STA position described below.

The dedicated Shift Technical Advisor shall have a bachelor's degree or equivalent in a scientific or engineering discipline and shall have received specific training in the response and analysis of the unit for transients and accidents, and in unit design and layout, including the capabilities of instrumentation and controls in the control room.

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TR 3.13.1 Spent Fuel Pool Instrumentation

TLCO 3.13.1 The primary and back-up spent fuel pool level instruments shall be OPERABLE.

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The primary or the back-up spent fuel pool level instrument is inoperable.	A.1 Restore spent fuel pool level instrument to OPERABLE status	90 days
B. Action A.1 completion time not met.	B.1 Implement compensatory measures	Immediately
C. The primary and the back-up spent fuel pool level instruments are inoperable.	C.1 Initiate actions to restore one of the channels of instrumentation. AND C.2 Implement compensatory measures such as use of alternate suitable equipment or supplemental personnel	24 hours 72 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
TSR 3.13.1.1	Perform CHANNEL FUNCTIONAL TEST	12 months AND Within 60 days prior to a planned refueling outage if not performed in previous 12 months

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3.8 ELECTRICAL POWER SYSTEMS

3.8.9 Distribution Systems-Operating

TLCO 3.8.9 Division I and Division II AC electrical power distribution subsystems in Table TR 3.8.9-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Division I or II AC electrical power distribution subsystems inoperable.	A.1 Restore Division I and II AC electrical power distribution subsystems to OPERABLE status. OR A.2 Declare supported components inoperable.	8 hours AND 16 hours from discovery of failure to meet TLCO

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.9.1 Verify correct breaker alignments and voltage to required AC electrical power distribution subsystems.	7 days

Table TR 3.8.9-1
AC Electrical Power Distribution Systems

TYPE	NOMINAL VOLTAGE	DIVISION I*	DIVISION II*
AC Electric Power Distribution System	120 V Dist. Panels	1SCV*PNL2G1 and 1SCV*PNL2E1	1SCV*PNL2F1 and 1SCV*PNL2H1

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TR 3.9.14 Crane Travel - Spent and New Fuel Storage, Transfer and Upper Containment Fuel Pools

TLCO 3.9.14 Except for movement of the spent fuel pool gates for repair or seal replacement, loads in excess of 1200 pounds shall be prohibited from travel over fuel assemblies in the spent or new fuel storage, transfer or upper containment fuel pool racks and all loads shall be prohibited from travel over irradiated fuel when water level is < 23' over the irradiated fuel.

APPLICABILITY: With fuel assemblies in the spent or new fuel storage, transfer or upper containment fuel pools.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. With the requirements of the above specification not satisfied.	A.1 Place the crane load in a safe condition.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
TSR 3.9.14.1	The fuel building crane loads shall be verified to weigh less than or equal to 1200 pounds, except for movement of the spent fuel pool gates for repair or seal replacement.	Before travel over fuel assemblies in the spent or new fuel storage pools and the lower transfer pools
TSR 3.9.14.2	The reactor building polar crane loads shall be verified to weigh less than or equal to 1200 pounds.	Before travel over fuel assemblies in the upper transfer and containment fuel pools

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TR 3.13.2 Diverse and Flexible Coping Strategies (FLEX) Equipment

TLCO 3.13.2.1 The FLEX equipment specified in Table 3.13.2.1-1 shall be OPERABLE.

APPLICABILITY: At all times.

ACTIONS

---NOTE---
Separate Condition entry is allowed for each FLEX component.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more FLEX components specified in Table 3.13.2.1-1 does not meet the Column 2 requirements.	A.1 Restore the FLEX component to Column 2 OPERABLE status	90 days
B. Action A.1 completion time not met. OR One or more FLEX components specified in Table 3.13.2.1-1 does not meet the Column 2 requirements during a forecast site specific external event.	B.1 Supplement the FLEX component with alternate suitable equipment	Immediately
C. One or more FLEX components specified in Table 3.13.2.1-1 does not meet the Column 1 requirements.	C.1 Initiate actions to restore FLEX capability to Column 1 OPERABLE status AND C.2 Implement compensatory measures	24 hours 72 hours

TABLE 3.13.2.1-1

FLEX EQUIPMENT THAT DIRECTLY PERFORMS A FLEX MITIGATION STRATEGY FOR THE KEY SAFETY FUNCTIONS

COMPONENT	NUMBER REQUIRED TO SUPPORT FLEX STRATEGIES (Column 1)	NUMBER TO MEET FLEX SPARE REQUIREMENTS (Column 2)
500KW FLEX diesel generator(1) (FLX-EG3 / FLX-EG4)	1	2
SSW FLEX pump(1) ([FLX-P1 AND FLX-EG5](2) / FLX-P2)	1	2
200KW FLEX diesel generator(1) (FLX-EG1 / FLX-EG2)	1	2
Hydrogen igniter diesel generator(1) (HCS-ENG1 / FLX-EG7)	1	2
SFP makeup FLEX pump (FLX-P3 / FPW-P4)	1	2

(1) Component OPERABILITY is NOT required if reactor pressure vessel is defueled.

(2) OPERABILITY of FLX-P1/FLX-EG5 combination requires the availability of an electrical connection at the G-tunnel disconnect switch

TR 3.13.3 FLEX Fluid and Electrical Connection Components

TLCO 3.13.3.1 The FLEX fluid and electrical connection components required to implement the FLEX strategy when the FLEX equipment is connected at the point specified in Table 3.13.3.1-1 shall be OPERABLE.

APPLICABILITY: At all times.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each FLEX connection.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The primary or secondary connection for one or more safety functions / FLEX components specified in Table 3.13.3.1-1 is not OPERABLE.	A.1 Restore the FLEX connection to OPERABLE status.	90 days
B. Action A.1 completion time not met.	B.1 Supplement the FLEX connection with an additional connection that meets the requirements of NEI 12-06 including diversity.	Immediately
C. The primary and secondary connection for one or more safety functions/FLEX components specified in Table 3.13.3.1-1 are not OPERABLE.	C.1 Initiate actions to restore FLEX capability AND C.2 Implement compensatory measures	24 hours 72 hours

TABLE 3.13.3.1-1

FLEX CONNECTIONS THAT DIRECTLY PERFORM A FLEX MITIGATION STRATEGY FOR THE KEY SAFETY FUNCTIONS

SAFETY FUNCTION/FLEX COMPONENT	PRIMARY CONNECTION POINT	SECONDARY CONNECTION POINT
Maintain core cooling / SSW FLEX pump suction(1)	SWP-V3110	SWP-V3111
Maintain core cooling / SSW FLEX pump discharge(1)	SWP-V3099	Note (2)
Maintain core cooling / 200 KW FLEX generator(1)	EJS-RCPT1	BYS-RCPT7
Maintain core cooling / 500 KW FLEX generator for SPC pumps(1)	SPC-RCPT1 and (SPC-TRS1 or SPC-TRS2)	SPC-TRS1 or SPC-TRS2
Maintain containment / hydrogen igniter diesel generator(1)	HCS-PNL01A1 or HCS-PNL01A2	HCS-PNL01B1 or HCS-PNL01B2
Maintain SFP cooling / SFP makeup FLEX pump discharge	Hose routed to pool or spray monitor	SFC-V66
Maintain core cooling / SPC pumps (primary) - SFP makeup FLEX pump (secondary) (1)	RHS-V3022	E21-VF025
Maintain core cooling / Phase 3 FLEX generator(1)	EHS-RCPT1	ENS-SWG1B (ACB-24)
Maintain core cooling / RCIC suction to upper containment pool cross-tie isolation valve(1)	ICS-V3029	Note (2)

(1) Connection OPERABILITY is NOT required if reactor pressure vessel is defueled.

(2) There is no secondary connection point for this function. Loss of the primary connection point requires entry into Required Actions C.1 AND C.2.

TR 3.13.4 Plant FLEX Support Equipment

TLCO 3.13.4.1 The suppression pool cooling system, including one SPC pump and the SPC heat exchanger, shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Suppression pool cooling system inoperable.	A.1 Initiate actions to restore FLEX capability	24 hours

TR 3.13.4 Plant FLEX Support Equipment

TLCO 3.13.4.2 At least twelve (12) air cylinders are OPERABLE to support FLEX Phase 2 strategy for operation of SRVs and suppression pool level instrumentation.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Less than 12 air cylinders with a minimum pressure of 2400 psig to support the FLEX Phase 2 strategy.	A.1 Initiate actions to restore FLEX capability	24 hours

Enclosure 2
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Technical Specifications Bases Revision Pages

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B 3.4-30	0	B 3.5-7	0	B 3.6-22	110	B 3.6-63	0
B 3.4-31	140	B 3.5-8	0	B 3.6-23	0	B 3.6-64	139
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B 3.4-38	149	B 3.5-16	0	B 3.6-31	0	B 3.6-73	0
B 3.4-39	110	B 3.5-17	0	B 3.6-32	0	B 3.6-74	0
B 3.4-40	110	B 3.5-18	0	B 3.6-33	0	B 3.6-75	133
B 3.4-41	133	B 3.5-19	0	B 3.6-34	0	B 3.6-76	143
B 3.4-42	110	B 3.5-20	6-14	B 3.6-35	109	B 3.6-77	143
B 3.4-43	0	B 3.5-21	133	B 3.6-36	0	B 3.6-78	122
B 3.4-44	0	B 3.5-22	133	B 3.6-37	109	B 3.6-79	0
B 3.4-45	133	B 3.5-23	0	B 3.6-38	143	B 3.6-80	133
B 3.4-46	0	B 3.5-24	143	B 3.6-39	144	B 3.6-81	2-8
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BASES

BACKGROUND (continued)

2. SR 3.6.1.1.1 leakage rate requirements are in conformance with 10 CFR 50, Appendix J, Option B (Ref. 3), as modified by approved exemptions.

APPLICABLE SAFETY ANALYSES

The safety design basis for the primary containment is that it must withstand the pressures and temperatures of the limiting DBA without exceeding the design leakage rate.

The DBA that postulates the maximum release of radioactive material within primary containment is a LOCA. In the analysis of this accident, it is assumed that primary containment is OPERABLE such that release of fission products to the environment is controlled by the rate of primary containment leakage.

Analytical methods and assumptions involving the primary containment are presented in References 1 and 2. The safety analyses assume a nonmechanistic fission product release following a DBA, which forms the basis for determination of offsite doses. The fission product release is, in turn, based on an assumed leakage rate from the primary containment. OPERABILITY of the primary containment ensures that the leakage rate assumed in the safety analyses is not exceeded.

The maximum allowable leakage rate for the primary containment (L_a) is 0.325% (Amendment #132) by weight of the containment and drywell air per 24 hours at the design basis LOCA maximum peak containment pressure (P_a) of 7.6 psig (Ref. 4).

10 CFR 50 Appendix J defines P_a as the "calculated peak containment internal pressure related to the design basis accident and specified either in the technical specification or associated bases." The containment pressure response is shown in RBS USAR Figures 6.2-4 for main steam line breaks and 6.2-5 for reactor coolant recirculation line breaks. These figures show the pressure rise in containment and the wetwell. The containment is the air space above the hydraulic control unit (HCU) floor while the wetwell is the region between the HCU floor and the surface of the suppression pool. The wetwell pressure is initially the same as the containment pressure. At about 2 seconds, the wetwell pressure increases rapidly while the containment pressure increases gradually. At about 5 to 6 seconds, the wetwell pressure decreases to the same pressure as the containment pressure. After this point, both the wetwell and containment pressure increase in unison to an eventual peak of 3.6 psig.

(continued)

BASES

The short-term localized pressure spike in wetwell pressure (9.3 psig, considering Technical Specification allowable initial conditions) is not appropriate to use for P_a, as that value is not representative of the long-term potential leakage for the containment as a whole. Accordingly, RBS was granted an exemption to the Appendix J definition of Pa by NRC (Reference 6).

Primary containment satisfies Criterion 3 of the NRC Policy Statement.

LCO Primary containment OPERABILITY is maintained by limiting overall leakage to $\leq 1.0\ L_a$. During the first startup following testing in accordance with the Primary Containment Leakage Rate Testing Program (Ref. 5), the leakage rate acceptance criteria are $\leq 0.60\ L_a$ for the Type B and Type C tests and $\leq 0.75\ L_a$ for Type A tests. Compliance with this LCO will ensure a primary containment configuration,

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.1.1 (continued)

test requirements of the Primary Containment Leakage Rate Testing Program (Ref. 5). Failure to meet air lock leakage testing (SR 3.6.1.2.1 and SR 3.6.1.2.4) resilient seal primary containment purge valve leakage testing (SR 3.6.1.3.5), secondary containment bypass leakage (SR 3.6.1.3.9), main steam positive leakage control system (SR 3.6.1.3.10), or hydrostatically tested valve leakage (SR 3.6.1.3.11) does not necessarily result in a failure of this SR. The impact of the failure to meet these SRs must be evaluated against the Type A, B, and C acceptance criteria of the Primary Containment Leakage Rate Testing Program. The Primary Containment overall leakage rate acceptance criteria is $\leq 1.0\ L_a$. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are $\leq 0.60\ L_a$ on a Maximum Pathway Leakage Rate (MXPLR) for the Type B and Type C tests and $\leq 0.75\ L_a$ for Type A tests. The MXPLR for combined Type B and C leakage is the measured leakage through the worst of the two isolation valves, unless a penetration is isolated by use of one closed and deactivated automatic valve, closed manual valve, or blind flange. In this case, the MXPLR of the isolated penetration is assumed to be the measured leakage through the isolation device. At $\leq 1.0\ L_a$ the offsite dose consequences are bounded by the assumptions of the safety analysis. The Frequency is required by the Primary Containment Leakage Testing Program.

REFERENCES

1. USAR, Section 6.2.
2. USAR, Section 15.6.5.
3. 10 CFR 50, Appendix J, Option B.
4. USAR, Section 6.2.6.
5. Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995.
6. NRC Letter No. RBC-51145, dated August 21, 2013, "River Bend Station – Unit 1, Exemption from the Requirements of 10 CFR Part 50 Appendix J"

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B 3.6-103	121	B 3.7-1	110	B 3.8-8a	154	B 3.8-48	3-2
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B 3.6-105	110	B 3.7-3	110	B 3.8-10	154	B 3.8-50	0
B 3.6-106	0	B 3.7-4	1	B 3.8-11	154	B 3.8-51	125
B 3.6-107	6-5	B 3.7-5	1	B 3.8-12	154	B 3.8-51a	125
B 3.6-108	6-5	B 3.7-6	0	B 3.8-13	154	B 3.8-52	125
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B 3.7 PLANT SYSTEMS

B 3.7.3 Control Room Air Conditioning (AC) System

BASES

BACKGROUND

The Control Room AC System provides temperature control for the control room following isolation of the control room.

The Control Room AC System consists of two independent, redundant subsystems that provide cooling and heating of recirculated control room air. Each subsystem consists of heating coils, cooling coils, fans, chillers, compressors, ductwork, dampers, and instrumentation and controls to provide for control room temperature control.

The Control Room AC System is designed to provide a controlled environment under both normal and accident conditions. The Control Room AC System operation in maintaining the control room temperature is discussed in the USAR, Sections 6.4 and 9.4.1 (Refs. 1 and 2, respectively).

APPLICABLE SAFETY ANALYSES

The design basis of the Control Room AC System is to maintain the control room temperature for a 30 day continuous occupancy.

The Control Room AC System components are arranged in redundant safety related subsystems. During emergency operation, the Control Room AC System maintains a habitable environment and ensures the OPERABILITY of components in the control room. A single active failure of a component of the Control Room AC System, assuming a loss of offsite power, does not impair the ability of the system to perform its design function. Redundant detectors and controls are provided for control room temperature control. The Control Room AC System is designed in accordance with Seismic Category I requirements. The Control Room AC System is capable of removing sensible and latent heat loads from the control room, including consideration of equipment heat loads and personnel occupancy requirements to ensure equipment OPERABILITY.

The Control Room AC System satisfies Criterion 3 of the NRC Policy Statement.

(continued)

BASES (continued)

LCO

Two independent and redundant subsystems of the Control Room AC System are required to be OPERABLE to ensure that at least one is available, assuming a single failure disables the other subsystem. Total system failure could result in the equipment operating temperature exceeding limits.

The Control Room AC System is considered OPERABLE when the individual components necessary to maintain the control room temperature are OPERABLE in both subsystems. These components include the cooling coils, fans, chillers, compressors, ductwork, dampers, and associated instrumentation and controls.

APPLICABILITY

In MODE 1, 2, or 3, the Control Room AC System must be OPERABLE to ensure that the control room temperature will not exceed equipment OPERABILITY limits.

In MODES 4 and 5, the probability and consequences of a Design Basis Accident are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining the Control Room AC System OPERABLE is not required in MODE 4 or 5, except for the following situations under which significant radioactive releases can be postulated:

a. During operations with a potential for draining the reactor vessel (OPDRVs) and;

b. During movement of recently irradiated fuel assemblies in the primary containment or fuel building.

ACTIONS

A.1

With one control room AC subsystem inoperable, the inoperable control room AC subsystem must be restored to OPERABLE status within 30 days. With the unit in this condition, the remaining OPERABLE control room AC subsystem is adequate to perform the control room air conditioning function. However, the overall reliability is reduced because a single failure in the OPERABLE subsystem could result in loss of the control room air conditioning

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9

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 while maintaining a specified margin to the overspeed trip. The referenced load for DG 1A is the 943.1 kW low pressure core spray pump; for DG 1B, the 477.9 kW residual heat removal (RHR) pump; and for DG 1C the 1862.4 kW HPCS pump. The Standby Service Water (SSW) pump values are not used as the largest load since the SSW supplies cooling to the associated DG. If this load were to trip, it would result in the loss of the DG. As required by IEEE-308 (Ref. 13), 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. For the River Bend Station the lower value results from the first criteria.

This SR has been modified by two Notes. The reason for Note 1 is that credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post corrective maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

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 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 could experience.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.10

This Surveillance demonstrates the DG capability to reject a full load, i.e., maximum expected accident 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 DG damage protection. While the DG is not expected to experience this transient during an event and continue 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.

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 24 month Frequency 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 credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post corrective maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

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BASES

LCO 3.0.4 (continued)

The risk assessment may use quantitative, qualitative, or blended approaches, and the risk assessment will be conducted using the plant program, procedures, and criteria in place to implement 10CFR50.65 (a)(4), which requires that risk impacts of maintenance activities to be assessed and managed. The risk assessment, for the purposes of LCO 3.0.4 (b), must take into account all inoperable Technical Specification equipment regardless of whether the equipment is included in the normal 10CFR50.65 (a)(4) risk assessment scope. The risk assessments will be conducted using the procedures and guidance endorsed by Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Regulatory Guide 1.160 endorses the guidance in Section 11 of NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." These documents address general guidance for conduct of the risk assessment, quantitative and qualitative guidelines for establishing risk management actions, and example risk management actions. These include actions to plan and conduct other activities in a manner that controls overall risk, increased risk awareness by shift and management personnel, actions to reduce the duration of the condition, actions to minimize the magnitude of risk increases (establishment of backup success paths or compensatory measures), and determination that the proposed MODE change is acceptable. Consideration should also be given to the probability of completing restoration such that the requirements of the LCO would be met prior to the expiration of ACTIONS Completion Times that would require exiting the Applicability.

LCO 3.0.4.b may be used with single, or multiple systems and components unavailable. NUMARC 93-01 provides guidance relative to consideration of simultaneous unavailability of multiple systems and components.

The results of the risk assessment shall be considered in determining the acceptability of entering the MODE or other specified condition in the Applicability, and any corresponding risk management actions. The LCO 3.0.4.b risk assessments do not have to be documented.

The Technical Specifications allow continued operation with equipment unavailable in MODE 1 for the duration of the Completion Time. Since this is allowable, and since in general the risk impact in that particular MODE bounds the risk of transitioning into and through the applicable MODES or other specified conditions in the Applicability of the LCO, the use of the LCO 3.0.4.b allowance should be generally acceptable, as long as the risk is assessed and managed as stated above. However, there is a small subset of systems and components that have been determined to be more important to risk and use of the LCO 3.0.4.b allowance is prohibited. The LCOs governing these systems and components contain Notes prohibiting the use of LCO 3.0.4.b by stating that LCO 3.0.4.b is not applicable.

(continued)

BASES

LCO 3.0.3 (continued)

assemblies in the associated fuel storage pool." Therefore, this LCO can be applicable in any or all MODES. If the LCO and the Required Actions of LCO 3.7.6 are not met while in MODE 1, 2, or 3, there is no safety benefit to be gained by placing the unit in a shutdown condition. The Required Action of LCO 3.7.6 of "Suspend movement of irradiated fuel assemblies in the associated fuel storage pool(s)" is the appropriate Required Action to complete in lieu of the actions of LCO 3.0.3. These exceptions are addressed in the individual Specifications.

LCO 3.0.4

LCO 3.0.4 establishes limitations on changes in MODES or other specified conditions in the Applicability when an LCO is not met. It allows placing the unit in a MODE or other specified condition stated in that Applicability (e.g., the Applicability desired to be entered) when unit conditions are such that the requirements of the LCO would not be met, in accordance with LCO 3.0.4.a, LCO 3.0.4.b, or LCO 3.0.4.c.

LCO 3.0.4.a allows entry into a MODE or other specified condition in the Applicability with the LCO not met when the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time. Compliance with Required Actions that permit continued operation of the unit for an unlimited period of time in a MODE or other specified condition provides an acceptable level of safety for continued operation. This is without regard to the status of the unit before or after the MODE change. Therefore, in such cases, entry into a MODE or other specified condition in the Applicability may be made in accordance with the provisions of the Required Actions.

LCO 3.0.4.b allows entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the applicability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate.

BASES

LCO 3.0.9 (continued)

function(s) under the described conditions. LCO 3.0.9 allows 30 days before declaring the supported system(s) inoperable and the LCO(s) associated with the supported system(s) not met. A maximum time is placed on each use of this allowance to ensure that as required barriers are found or are otherwise made unavailable, they are restored. However, the allowable duration may be less than the specified maximum time based on the risk assessment.

If the allowed time expires and the barriers are unable to perform their related support function(s), the supported system's LCO(s) must be declared not met and the Conditions and Required Actions entered in accordance with LCO 3.0.2.

This provision does not apply to barriers which support ventilation systems or to fire barriers. The Technical Specifications for ventilation systems provide specific Conditions for inoperable barriers. Fire barriers are addressed by other regulatory requirements and associated plant programs. This provision does not apply to barriers which are not required to support system OPERABILITY (see NRC Regulatory Issue Summary 2001-09, "Control of Hazard Barriers," dated April 2, 2001).

The provisions of LCO 3.0.9 are justified because of the low risk associated with required barriers not being capable of performing their related support function. This provision is based on consideration of the following initiating event categories:

- Loss of coolant accidents;
- High energy line breaks;
- Feedwater line breaks;
- Internal flooding;
- External flooding;
- Turbine missile ejection; and
- Tornado or high wind.

The risk impact of the barriers which cannot perform their related support function(s) must be addressed pursuant to the risk assessment and management provision of the Maintenance Rule, 10 CFR 50.65 (a)(4), and the associated implementation guidance, Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Regulatory Guide 1.160 endorses the guidance in Section 11 of NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

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BASES

LCO 3.0.7 (continued)

demonstrate select unit performance characteristics, to perform special maintenance activities, and to perform special evolutions. Special Operations LCOs in Section 3.10 allow specified TS requirements to be changed to permit performances of these special tests and operations, which otherwise could not be performed if required to comply with the requirements of these TS. Unless otherwise specified, all the other TS requirements remain unchanged. This will ensure all appropriate requirements of the MODE or other specified condition not directly associated with or required to be changed to perform the special test or operation will remain in effect.

The Applicability of a Special Operations LCO represents a condition not necessarily in compliance with the normal requirements of the TS. Compliance with Special Operations LCOs is optional. A special operation may be performed either under the provisions of the appropriate Special Operations LCO or under the other applicable TS requirements. If it is desired to perform the special operation under the provisions of the Special Operations LCO, the requirements of the Special Operations LCO shall be followed. When a Special Operations LCO requires another LCO to be met, only the requirements of the LCO statement are required to be met regardless of that LCO's Applicability (i.e., should the requirements of this other LCO not be met, the ACTIONS of the Special Operations LCO apply, not the ACTIONS of the other LCO). However, there are instances where the Special Operations LCO's ACTIONS may direct the other LCO's ACTIONS be met. The Surveillances of the other LCO are not required to be met, unless specified in the Special Operations LCO. If conditions exist such that the Applicability of any other LCO is met, all the other LCO's requirements (ACTIONS and SRs) are required to be met concurrent with the requirements of the Special Operations LCO.

LCO 3.0.8

Not Used

LCO 3.0.9

LCO 3.0.9 establishes conditions under which systems described in the Technical Specifications are considered to remain OPERABLE when required barriers are not capable of providing their related support function(s).

Barriers are doors, walls, floor plugs, curbs, hatches, installed structures or components, or other devices, not explicitly described in Technical Specifications, that support the performance of the safety function of systems described in the Technical Specifications. This LCO states that the supported system is not considered to be inoperable solely due to required barriers not capable of performing their related support

(continued)

BASES

SR 3.0.3 (continued)

the program in place to implement 10CFR 50.65(a)(4) and its implementation guidance, NRC Regulatory Guide 1.160 "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." This Regulatory Guidance addresses consideration of temporary and aggregate risk impacts, determination of risk management action thresholds, and risk management action up to and including plant shutdown. The missed Surveillance should be treated as an emergent condition as discussed in the Regulatory Guide. The risk evaluation may use quantitative, qualitative, or blended methods. The degree of depth and rigor of the evaluation should be commensurate with the importance of the component. Missed Surveillances for important components should be analyzed quantitatively. If the results of the risk evaluation determine the risk increase is significant, this evaluation should be used to determine the safest course of action. All missed Surveillances will be placed in the licensee's Corrective Action Program.

If a Surveillance is not completed within the allowed delay period, then the equipment is considered inoperable or the variable then is considered outside the specified limits and the Completion Times of the Required Actions for the applicable LCO Conditions begin immediately upon expiration of the delay period. If a Surveillance is failed within the delay period, then the equipment is inoperable, or the variable is outside the specified limits and the Completion Times of the Required Actions for the applicable LCO Conditions begin immediately upon the failure of the Surveillance.

(continued)

BASES

SR 3.0.3 (continued)

performed in accordance with SR 3.0.2, and not at the time that the specified Frequency was not met. This delay period provides adequate time to complete Surveillances that have been missed. This delay period permits the completion of a Surveillance before complying with Required Actions or other remedial measures that might preclude completion of the Surveillance.

The basis for this delay period includes consideration of unit conditions, adequate planning, availability of personnel, the time required to perform the Surveillance, the safety significance of the delay in completing the required Surveillance, and the recognition that the most probable result of any particular Surveillance being performed is the verification of conformance with the requirements.

When a Surveillance with a Frequency based not on time intervals, but upon specified unit conditions, operating situations, or requirements of regulations (e.g., prior to entering MODE 1 after each fuel loading, or in accordance with 10CFR 50 Appendix J, as modified by approved exemptions, etc.) is discovered to not have been performed when specified, SR 3.0.3 allows the full delay period of up to the specified Frequency to perform the Surveillance. However, since there is not a time interval specified, the missed Surveillance should be performed at the first reasonable opportunity.

SR 3.0.3 provides a time limit for, and allowances for the performance of, Surveillances that become applicable as a consequence of MODE changes imposed by Required Actions.

Failure to comply with specified Frequencies for SRs is expected to be an infrequent occurrence. Use of the delay period established by SR 3.0.3 is a flexibility which is not intended to be used as an operational convenience to extend Surveillance intervals. While up to 24 hours or the limit of the specified Frequency is provided to perform the missed Surveillance, it is expected that the missed Surveillance will be performed at the first reasonable opportunity. The determination of the first reasonable opportunity should include consideration of the impact on plant risk (from delaying the Surveillance as well as any plant configuration changes required or shutting the plant down to perform the Surveillance) and impact on any analysis assumptions, in addition to unit conditions, planning, availability or personnel, and the time required to perform the Surveillance. This risk impact should be managed through

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B 3.6-91	115	B 3.6-131	2-4	B 3.7-29	115	B 3.8-36	0
B 3.6-92	6-5	B 3.6-132	3-4	B 3.7-30	0	B 3.8-37	115
B 3.6-93	115	B 3.6-133	3-4	B 3.7-31	115	B 3.8-38	110
B 3.6-94	143	B 3.6-134	2-8	B 3.8-1	0	B 3.8-39	102
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B 3.6-97	159	B 3.6-137	2-8	B 3.8-4	153	B 3.8-42	0
B 3.6-98	0	B 3.6-138	2-8	B 3.8-4a	154	B 3.8-43	0
B 3.6-99	159	B 3.6-139	2-8	B 3.8-5	154	B 3.8-44	0
B 3.6-100	143	B 3.6-140	2-8	B 3.8-6	154	B 3.8-45	155
B 3.6-101	121	B 3.6-141	2-8	B 3.8-7	154	B 3.8-46	0
B 3.6-102	121	B 3.6-142	2-8	B 3.8-8	154	B 3.8-47	0
B 3.6-103	121	B 3.7-1	110	B 3.8-8a	154	B 3.8-48	3-2
B 3.6-104	6-5	B 3.7-2	110	B 3.8-9	154	B 3.8-49	134
B 3.6-105	110	B 3.7-3	110	B 3.8-10	154	B 3.8-50	0
B 3.6-106	0	B 3.7-4	1	B 3.8-11	154	B 3.8-51	125
B 3.6-107	6-5	B 3.7-5	1	B 3.8-12	154	B 3.8-51a	125
B 3.6-108	6-5	B 3.7-6	0	B 3.8-13	154	B 3.8-52	125
B 3.6-109	6-5	B 3.7-7	3-1	B 3.8-14	127	B 3.8-52a	125
B 3.6-110	6-5	B 3.7-8	143	B 3.8-15	139	B 3.8-52b	148
B 3.6-111	6-5	B 3.7-9	0	B 3.8-16	151	B 3.8-53	125
B 3.6-112	159	B 3.7-10	159	B 3.8-17	102	B 3.8-54	125
B 3.6-113	110	B 3.7-11	159	B 3.8-18	153	B 3.8-55	143
B 3.6-114	6-5	B 3.7-12	132	B 3.8-18a	153	B 3.8-56	143
B 3.6-115	159	B 3.7-12a	132	B 3.8-19	157	B 3.8-57	120
B 3.6-116	143	B 3.7-13	132	B 3.8-20	143	B 3.8-58	120
B 3.6-117	0	B 3.7-14	159	B 3.8-21	143	B 3.8-59	110
B 3.6-118	0	B 3.7-15	143	B 3.8-22	113	B 3.8-60	110
B 3.6-119	143	B 3.7-16	132	B 3.8-23	143	B 3.8-61	115
B 3.6-120	135	B 3.7-17	157	B 3.8-24	143	B 3.8-62	0
B 3.6-121	119	B 3.7-18	110	B 3.8-25	151	B 3.8-63	0
B 3.6-122	2-4	B 3.7-19	6-13	B 3.8-26	151	B 3.8-64	0
B 3.6-123	2-4	B 3.7-20	115	B 3.8-27	143	B 3.8-65	0
B 3.6-124	2-4	B 3.7-21	143	B 3.8-28	143	B 3.8-66	1
B 3.6-125	2-4	B 3.7-22	0	B 3.8-29	143	B 3.8-67	4-5
B 3.6-126	2-4	B 3.7-23	0	B 3.8-30	143	B 3.8-68	4-5
B 3.6-127	2-4	B 3.7-24	1	B 3.8-31	102	B 3.8-69	1
B 3.6-128	143	B 3.7-25	137	B 3.8-32	3-1		
B 3.6-129	3-4	B 3.7-26	137	B 3.8-33	3-1		
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BASES

BACKGROUND (continued)

Operation above the boundary of the nucleate boiling regime could result in excessive cladding temperature because of the onset of transition boiling and the resultant sharp reduction in heat transfer coefficient. Inside the steam film, high cladding temperatures are reached, and a cladding water (zirconium water) reaction may take place. This chemical reaction results in oxidation of the fuel cladding to a structurally weaker form. This weaker form may lose its integrity, resulting in an uncontrolled release of activity to the reactor coolant.

APPLICABLE SAFETY ANALYSES

The fuel cladding must not sustain damage as a result of normal operation and AOOs. The reactor core SLs are established to preclude violation of the fuel design criterion that an MCPR SL is to be established, such that at least 99.9% of the fuel rods in the core would not be expected to experience the onset of transition boiling.

The Reactor Protection System setpoints (LCO 3.3.1.1, "Reactor Protection System (RPS) Instrumentation"), in combination with other LCOs, are designed to prevent any anticipated combination of transient conditions for Reactor Coolant System water level, pressure, and THERMAL POWER level that would result in reaching the MCPR SL.

2.1.1.1 Fuel Cladding Integrity

The use of the fuel vendor's critical power correlations are valid for critical power calculations at pressures ≥ 685 psig and core flows ≥ 10% of rated flow (Ref. 2.7 and 8). For operation at low pressures or low flows, another basis is used, as follows:

> Since the pressure drop in the bypass region is essentially all elevation head, the core pressure drop at low power and flows will always be > 4.5 psi. Analyses (Ref. 2) show that with a bundle flow of 28×10^3 lb/hr, bundle pressure drop is nearly independent of bundle power and has a value of 3.5 psi. Thus, the bundle flow with a 4.5 psi driving head will be > 28×10^3 lb/hr. Full scale ATLAS test data taken at pressures from 14.7 psia to 700 psia indicate that the fuel

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1.b. Main Steam Line Pressure-Low (continued)

is not reached. In addition, this Function supports actions to ensure that Safety Limit 2.1.1.1 is not exceeded. (This Function closes the MSIVs prior to pressure decreasing below 685 psig, which results in a scram due to MSIV closure, thus reducing reactor power to < 23.8% RTP.)

The MSL low pressure signals are initiated from four transmitters that are connected to the MSL header. The transmitters are arranged such that, even though physically separated from each other, each transmitter is able to detect low MSL pressure. Four channels of Main Steam Line Pressure-Low Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Allowable Value was selected to be high enough to prevent excessive RPV depressurization.

The Main Steam Line Pressure-Low Function is only required to be OPERABLE in MODE 1 since this is when the assumed transient can occur (Ref. 2).

This Function isolates the Group 6 valves.

1.c. Main Steam Line Flow-High

Main Steam Line Flow-High is provided to detect a break of the MSL and to initiate closure of the MSIVs. If the steam were allowed to continue flowing out of the break, the reactor would depressurize and the core could uncover. If the RPV water level decreases too far, fuel damage could occur. Therefore, the isolation is initiated on high flow to prevent or minimize core damage. The Main Steam Line Flow-High Function is directly assumed in the analysis of the main steam line break (MSLB) accident (Ref. 1). The isolation action, along with the scram function of the RPS, ensures that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46 and offsite doses do not exceed the 10 CFR 50.67 limits.

The MSL flow signals are initiated from 16 transmitters that are connected to the four MSLs. The transmitters are arranged such that, even though physically separated from

(continued)

B 3.6 CONTAINMENT SYSTEMS

B 3.6.4.3 Standby Gas Treatment (SGT) System

BASES

BACKGROUND

The SGT System is required by 10 CFR 50, Appendix A, GDC 41, "Containment Atmosphere Cleanup" (Ref. 1). The function of the SGT System is to ensure that radioactive materials that leak from the primary containment into the secondary containment following a Design Basis Accident (DBA) are filtered and adsorbed prior to exhausting to the environment.

The SGT System consists of two fully redundant subsystems, each with its own set of ductwork, dampers, charcoal filter train, and controls.

Each charcoal filter train consists of (components listed in order of the direction of the air flow):

a. A moisture separator;

b. Deleted

c. A prefilter;

d. A high efficiency particulate air (HEPA) filter;

e. A charcoal adsorber;

f. A second HEPA filter; and

g. A centrifugal fan.

The SGT System serves as a backup non-ESF system to the Annulus Pressure Control System (APCS) during normal operation. Upon loss of the APCS, or upon an ESF signal (i.e., LOCA), the annulus air and air from the shielded compartments in the auxiliary building are automatically diverted through the SGT System filter trains.

(continued)

BASES

BACKGROUND (continued)

If the SGT System filter trains are not treating the annulus atmosphere or the exhaust air of the shielded compartments in the auxiliary building, the containment and drywell purge can be manually diverted through both SGT System filter trains. By utilizing both SGTS filter trains, a maximum of 25,000 cfm of containment/drywell purge air can be processed by the filter trains.

The SGT System is designed to maintain a negative pressure of at least 0.50 in W.G. in the annulus during post-LOCA operation. With the annulus at a negative pressure, any potential leakage is directed inward (away from the shield building). Therefore, if a primary containment DBA occurs, airborne radioactivity which exfiltrates the steel primary containment is collected and passed through a filter train of the SGT System before being released.

The SGT System is also designed to maintain a negative pressure of at least 0.25 in W.G. in the Auxiliary Building.

The moisture separator is provided to remove entrained water in the air. The prefilter removes large particulate matter, while the HEPA filter is provided to remove fine particulate matter and protect the charcoal from fouling. The charcoal adsorber removes gaseous elemental iodine and organic iodides, and the final HEPA filter is provided to collect any carbon fines exhausted from the charcoal adsorber (Ref. 2).

APPLICABLE SAFETY ANALYSES

The design basis for the SGT System is to mitigate the consequences of a loss of coolant accident (Ref. 3). For all events analyzed, the SGT System is shown to be automatically initiated to reduce, via filtration and adsorption, the radioactive material released to the environment.

The SGT System satisfies Criterion 3 of the NRC Policy Statement.

LCO

Following a DBA, a minimum of one SGT subsystem is required to maintain the secondary containment at a negative pressure with respect to the environment and to process gaseous releases. Meeting the LCO requirements for two operable subsystems ensures operation of at least one SGT subsystem in the event of a single active failure.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.4.3.1

Operating each SGT subsystem for ≥ 15 continuous minutes ensures that both subsystems are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. The 31 day Frequency was developed in consideration of the known reliability of fan motors and controls and the redundancy available in the system.

SR 3.6.4.3.2

This SR verifies that the required SGT filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The SGT System filter tests are in accordance with Regulatory Guide 1.52 (Ref. 4). 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). Specified test frequencies and additional information are discussed in detail in the VFTP.

SR 3.6.4.3.3

This SR requires verification that each SGT subsystem starts upon receipt of an actual or simulated initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.2.5 overlaps this SR to provide complete testing of the safety function.

SR 3.6.4.3.4

This SR requires verification that the SGT filter cooling bypass damper can be opened and the fan started. This ensures that the ventilation mode of SGT System operation is

(continued)

B 3.6 CONTAINMENT SYSTEMS

B 3.6.4.7 Fuel Building Ventilation System-Fuel Handling

BASES

BACKGROUND

The Fuel Building Ventilation System is required by 10 CFR 50, Appendix A, GDC 41, "Containment Atmosphere Cleanup" (Ref. 1). The function of the Fuel Building Ventilation System is to ensure that radioactive materials that escape from fuel assemblies damaged following a design basis Fuel Handling Accident (FHA) are filtered and adsorbed prior to exhausting to the environment.

The Fuel Building Ventilation System consists of two fully redundant subsystems, each with its own set of ductwork, dampers, charcoal filter train, and controls.

Each charcoal filter train consists of (components listed in order of the direction of the air flow):

a. A moisture separator;

b. Deleted

c. A prefilter;

d. A high efficiency particulate air (HEPA) filter;

e. A charcoal adsorber;

f. A second HEPA filter; and

g. A centrifugal fan with inlet flow control vanes.

The moisture separator is provided to remove entrained water in the air. The prefilter removes large particulate matter, while the HEPA filter is provided to remove fine particulate matter and protect the charcoal from fouling. The charcoal adsorber removes gaseous elemental iodine and organic iodides, and the final HEPA filter is provided to collect any carbon fines exhausted from the charcoal adsorber.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.4.7.2

Operating each fuel building ventilation charcoal filtration subsystem for ≥ 15 continuous minutes ensures that both subsystems are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. The 31 day Frequency was developed in consideration of the known reliability of fan motors and controls and the redundancy available in the system.

SR 3.6.4.7.3

This SR verifies that the required fuel building ventilation charcoal filtration filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The fuel building ventilation charcoal filtration filter tests are in accordance with Regulatory Guide 1.52 (Ref. 4). 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). Specified test frequencies and additional information are discussed in detail in the VFTP.

SR 3.6.4.7.4

This SR requires verification that each fuel building ventilation charcoal filtration subsystem starts upon receipt of an actual or simulated initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.2.5 overlaps this SR to provide complete testing of the safety function.

(continued)

B 3.7 PLANT SYSTEMS

B 3.7.2 Control Room Fresh Air (CRFA) System

BASES

BACKGROUND

The CRFA System provides a protected environment from which occupants can control the unit following an uncontrolled release of radioactivity, hazardous chemicals, or smoke.

The safety related function of the CRFA System used to control radiation exposure consists of two independent and redundant high efficiency air filtration subsystems for treatment of recirculated air or outside supply air and a CRE boundary that limits the inleakage of unfiltered air. Each CRFA subsystem consists of a demister, a prefilter, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section, a second HEPA filter, a fan, and the associated ductwork valves or dampers, doors, barriers, and instrumentation. Demisters remove water droplets from the airstream. Prefilters and HEPA filters remove particulate matter which may be radioactive. The charcoal adsorbers provide a holdup period for gaseous iodine, allowing time for decay.

The CRE is the area within the confines of the CRE boundary that contains the spaces that control room occupants inhabit to control the unit during normal and accident conditions. This area encompasses the control room, and may encompass other non-critical areas to which frequent personnel access or continuous occupancy is not necessary in the event of an accident. The CRE is protected for normal operation, natural events, and accident conditions. The CRE boundary is the combination of walls, floor, roof, ducting, doors, penetrations, and equipment that physically form the CRE. The OPERABILITY of the CRE boundary must be maintained to ensure that the inleakage of unfiltered air into the CRE will not exceed the inleakage assumed in the licensing basis analysis of design basis accident (DBA) consequences to CRE occupants. The CRE and its boundary are defined in the Control Room Envelope Habitability Program.

In addition to the safety related standby emergency filtration function, parts of the CRFA System are operated to maintain the CRE environment during normal operation. Upon receipt of the initiation signal(s) (indicative of conditions that could result in radiation exposure to CRE occupants, the CRFA System automatically switches to the isolation mode of operation to minimize infiltration of contaminated air into the CRE. A system of dampers isolates the CRE, and CRE air flow is recirculated and processed through either of the two filter subsystems.

The CRFA System is designed to maintain a habitable environment in the CRE for a 30 day continuous occupancy after a DBA, per the requirements of GDC 19 and 10CFR50.67. CRFA System operation in maintaining the CRE habitability is discussed in the USAR, Sections 6.4.1 and 9.4.1 (Refs. 1 and 2, respectively).

APPLICABLE SAFETY ANALYSES

The ability of the CRFA System to maintain the habitability of the CRE is an explicit assumption for the safety analyses presented in the USAR, Chapters 6

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

and 15 (Refs. 3 and 4, respectively). The isolation mode of the CRFA System is assumed to operate following a DBA. The radiological doses to CRE occupants as a result of the various DBAs are summarized in Reference 4. No single active or passive failure will cause the loss of outside or recirculated air from the CRE.

The CRFA System provides protection from smoke and hazardous chemicals to the CRE occupants. The analysis of hazardous chemical releases demonstrates that the toxicity limits are not exceeded in the CRE following a hazardous chemical release (Ref. 5). The evaluation of a smoke challenge demonstrates that it will not result in the inability of the CRE occupants to control the reactor either from the control room or from the remote shutdown panels (Ref. 6).

The CRFA System satisfies Criterion 3 of the NRC Policy Statement.

LCO

Two redundant subsystems of the CRFA System are required to be OPERABLE to ensure that at least one is available, if a single active failure disables the other subsystem. Total CRFA system failure, such as from a loss of both ventilation subsystems or from an inoperable CRE boundary, could result in a failure to meet the dose requirements of GDC 19 and 10CFR50.67 in the event of a DBA.

Each CRFA subsystem is considered OPERABLE when the individual components necessary to limit CRE occupant exposure are OPERABLE. A subsystem is considered OPERABLE when its associated:

a. Fan is OPERABLE;

b. HEPA filter and charcoal adsorber are not excessively restricting flow and are capable of performing their filtration functions; and

c. Demister, ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained.

In order for the CRFA subsystems to be considered OPERABLE, the CRE boundary must be maintained such that the CRE occupant dose from a large radioactive release does not exceed the calculated dose in the licensing basis consequence analyses for DBAs, and that CRE occupants are protected from hazardous chemicals and smoke.

The LCO is modified by a Note allowing the CRE boundary to be opened intermittently under administrative controls. This Note only applies to openings in the CRE boundary that can be rapidly restored to the design condition, such as doors, hatches, floor plugs, and access panels. For entry and exit through doors, the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, these controls should be proceduralized and consist of stationing a dedicated individual at the opening who is in continuous communication with the operators in the CRE. This individual will have a method to rapidly close the opening and to restore the CRE boundary to a condition equivalent to the design condition when a need for CRE isolation is indicated.

(continued)

BASES

ACTIONS (continued)

F.1 and F.2

During movement of recently irradiated fuel assemblies in the primary containment or fuel building or during OPDRVs, with two CRFA subsystems inoperable, or with one or more CRFA subsystems inoperable due to an inoperable CRE boundary, action must be taken immediately to suspend activities that present a potential for releasing radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk.

If applicable, movement of recently irradiated fuel assemblies in the primary containment and fuel building must be suspended immediately. Suspension of these activities shall not preclude completion of movement of a component to a safe position. If applicable, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1

This SR verifies that a subsystem in a standby mode starts on demand from the control room and continues to operate with flow through the HEPA filters and charcoal adsorbers. Standby systems should be checked periodically to ensure that they start and function properly. As the environmental and normal operating conditions of this system are not severe, testing each subsystem once every month provides an adequate check on this system. Furthermore, the 31 day Frequency is based on the known reliability of the equipment and the two subsystem redundancy available.

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B 3.8-71	111	B 3.9-19	115	B 3.10-24	0		
B 3.8-72	111	B 3.9-20	119	B 3.10-25	0		
B 3.8-73	0	B 3.9-21	115	B 3.10-26	0		
B 3.8-74	110	B 3.9-22	115	B 3.10-27	0		
B 3.8-75	115	B 3.9-23	119	B 3.10-28	0		
B 3.8-76	110	B 3.9-24	115	B 3.10-29	0		
B 3.8-77	0	B 3.9-25	0	B 3.10-30	0		
B 3.8-78	0	B 3.9-26	0	B 3.10-31	0		
B 3.8-79	1	B 3.9-27	4-2	B 3.10-32	0		
B 3.8-80	0	B 3.9-28	4-2	B 3.10-33	0		
B 3.8-81	0	B 3.9-28a	4-2	B 3.10-34	0		
B 3.8-82	0	B 3.9-29	0	B 3.10-35	0		
B 3.8-83	0	B 3.9-30	0	B 3.10-36	0		
B 3.8-84	0	B 3.9-31	4-2	B 3.10-37	0		
B 3.8-85	103	B 3.9-32	4-2	B 3.10-38	6-14		
B 3.8-86	0	B 3.9-32a	4-2				
B 3.8-87	0	B 3.10-1	146				
B 3.8-88	160	B 3.10-2	146				
B 3.8-89	110	B 3.10-3	146				
B 3.8-90	115	B 3.10-4	0				
B 3.8-91	115	B 3.10-5	0				
B 3.8-92	0	B 3.10-6	0				
B 3.9-1	0	B 3.10-7	0				
B 3.9-2	0	B 3.10-8	0				
B 3.9-3	4-5	B 3.10-9	0				
B 3.9-4	119	B 3.10-10	0				
B 3.9-5	0	B 3.10-11	0				
B 3.9-6	0	B 3.10-12	0				
B 3.9-7	0	B 3.10-13	0				
B 3.9-8	0	B 3.10-14	0				
B 3.9-9	0	B 3.10-15	0				
B 3.9-10	103	B 3.10-16	0				
B 3.9-11	0	B 3.10-17	0				
B 3.9-12	0	B 3.10-18	0				
B 3.9-13	0	B 3.10-19	0				
B 3.9-14	0	B 3.10-20	0				
B 3.9-15	0	B 3.10-21	0				
B 3.9-16	0	B 3.10-22	0				
B 3.9-17	6-14						

Table B 3.8.9-1 (page 1 of 1)
AC and DC Electrical Power Distribution Systems

TYPE	NOMINAL VOLTAGE	DIVISION I*	DIVISION II*	DIVISION III*
AC Electric Power Distribution System	4160 V	1ENS*SWG1A**	1ENS*SWG1B**	1E22*S004**
	480 V LDCs	1EJS*LDC1A** 1EJS*LDC2A**	1EJS*LDC1B** 1EJS*LDC2B**	---
	480 V MCCs	1EHS*MCC2A 2C, 2E, 2G, 2J, 2L, 8A, 14A, 15A, 16°	1EHS*MCC2B 2D, 2F, 2H, 2K, 8B, 14B, 15B, 16B	1E22*S002**
	120 V Dist. Panels	1SCV*PNL2A1 2A2, 2C1, 2J1, 2L1, 8A1, 14A1, 15A1, 16A1	1SCV*PNL2B1 2B2, 2D1, 2K1, 8B1, 14B1, 15B1, 16B1	1E22*S002 PNL
AC Vital Bus Electric Power Distribution System	120 VAC	1VBS*PNL01A**	1VBS*PNL01B**	---
DC Electric Power Distribution System	125 V	1ENB*SWG01A**	1ENB*SWG01B**	---
	Dist. Panels	1ENB*PNL02A 03A, 04A 1ENB*MCC1	1ENB*PNL02B 03B	1E22*S001 PNL**

* Each division of the AC and DC electrical power distribution systems is a subsystem.

** Voltage verification required.

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B 2.0-3	6-15	B 3.1-23	0	B 3.3-3	0	B 3.3-39g	4-8
B 2.0-4	6-15	B 3.1-24	139	B 3.3-4	0	B 3.3-39h	4-8
B 2.0-5	115	B 3.1-25	107	B 3.3-5	0	B 3.3-40	0
B 2.0-6	115	B 3.1-26	139	B 3.3-6	0	B 3.3-41	6-13
B 2.0-7	0	B 3.1-27	0	B 3.3-7	6-4	B 3.3-42	6-6
B 2.0-8	115	B 3.1-28	0	B 3.3-8	4-8	B 3.3-43	6-13
B 2.0-9	115	B 3.1-29	6-14	B 3.3-8a	4-8	B 3.3-44	0
B 3.0-1	150	B 3.1-30	6-14	B 3.3-8b	4-8	B 3.3-45	0
B 3.0-2	0	B 3.1-31	6-14	B 3.3-9	4-8	B 3.3-46	0
B 3.0-3	0	B 3.1-32	0	B 3.3-10	4-8	B 3.3-47	143
B 3.0-4	0	B 3.1-33	6-13	B 3.3-11	1	B 3.3-48	6-13
B 3.0-5	133	B 3.1-34	6-13	B 3.3-12	0	B 3.3-49	1
B 3.0-5a	158	B 3.1-35	6-13	B 3.3-13	6-4	B 3.3-50	0
B 3.0-5b	133	B 3.1-36	0	B 3.3-14	0	B 3.3-51	1
B 3.0-6	133	B 3.1-37	143	B 3.3-15	0	B 3.3-52	116
B 3.0-7	0	B 3.1-38	143	B 3.3-16	0	B 3.3-53	6-2
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B 3.0-8a	142	B 3.1-40	0	B 3.3-18	1	B 3.3-55	133
B 3.0-9	150	B 3.1-41	5-6	B 3.3-19	1	B 3.3-56	133
B 3.0-9a	158	B 3.1-42	1	B 3.3-20	1	B 3.3-57	0
B 3.9-9b	150	B 3.1-43	143	B 3.3-21	1	B 3.3-58	0
B 3.0-10	0	B 3.1-44	143	B 3.3-22	1	B 3.3-59	143
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B 3.1-4	0	B 3.2-5	0	B 3.3-31	143	B 3.3-69	1
B 3.1-5	0	B 3.2-6	6-15	B 3.3-31a	4-8	B 3.3-70	124
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B 3.1-7	3-10	B 3.2-8	6-15	B 3.3-33	0	B 3.3-72	1
B 3.1-8	3-10	B 3.2-9	0	B 3.3-34	0	B 3.3-73	143
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B 3.1-11	3-10	B 3.2-12	4-8	B 3.3-37	0	B 3.3-76	0
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B 3.1-14	0	B 3.2-15	4-8	B 3.3-39a	4-8	B 3.3-79	0
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B 3.3-81	0	B 3.3-121	0	B 3.3-161	0	B 3.3-201	115
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B 3.3-88	0	B 3.3-128	0	B 3.3-168	143	B 3.3-208	0
B 3.3-89	0	B 3.3-129	0	B 3.3-169	0	B 3.3-209	1
B 3.3-90	0	B 3.3-130	0	B 3.3-170	141	B 3.3-210	1
B 3.3-91	0	B 3.3-131	130	B 3.3-171	6-5	B 3.3-211	1
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B 3.3-94	0	B 3.3-134	0	B 3.3-174	110	B 3.3-214	123
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B 3.3-97	0	B 3.3-137	0	B 3.3-177	6-5	B 3.3-217	0
B 3.3-98	0	B 3.3-138	0	B 3.3-178	6-5	B 3.3-218	0
B 3.3-99	0	B 3.3-139	115	B 3.3-179	6-5	B 3.3-219	0
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B 3.3-108	0	B 3.3-148	109	B 3.3-188	0	B 3.4-5	112
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B 3.3-113	0	B 3.3-153	116	B 3.3-193	0	B 3.4-10	0
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B 3.4-20	143	B 3.4-59	0	B 3.6-11	2-3	B 3.6-52	110
B 3.4-21	140	B 3.4-60	0	B 3.6-12	128	B 3.6-53	0
B 3.4-21a	140	B 3.4-61	6-13	B 3.6-13	6-10	B 3.6-54	0
B 3.4-22	0	B 3.4-62	6-14	B 3.6-14	143	B 3.6-55	0
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B 3.4-25	0	B 3.5-2	0	B 3.6-17	128	B 3.6-58	0
B 3.4-26	0	B 3.5-3	6-14	B 3.6-18	3-4	B 3.6-59	3-4
B 3.4-27	0	B 3.5-4	3-7	B 3.6-19	3-4	B 3.6-60	0
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B 3.4-29	0	B 3.5-6	133	B 3.6-21	129	B 3.6-62	0
B 3.4-30	0	B 3.5-7	161	B 3.6-22	110	B 3.6-63	0
B 3.4-31	140	B 3.5-7a	161	B 3.6-23	0	B 3.6-64	161
B 3.4-32	149	B 3.5-8	161	B 3.6-24	6-11	B 3.6-64a	161
B 3.4-33	149	B 3.5-8a	161	B 3.6-24a	6-11	B 3.6-65	161
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B 3.4-43	0	B 3.5-19	0	B 3.6-36	161	B 3.6-77	143
B 3.4-44	0	B 3.5-20	6-14	B 3.6-36a	161	B 3.6-78	122
B 3.4-45	133	B 3.5-21	133	B 3.6-37	109	B 3.6-79	0
B 3.4-46	0	B 3.5-22	133	B 3.6-38	161	B 3.6-80	133
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B 3.4-50	0	B 3.6-1	0	B 3.6-41a	161	B 3.6-84	6-5
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B 3.4-53	6-4	B 3.6-3	2-1	B 3.6-44	3-9	B 3.6-86	161
B 3.4-54	6-13	B 3.6-4	156	B 3.6-45	3-9	B 3.6-87	161
B 3.4-55	6-4	B 3.6-5	0	B 3.6-46	3-9	B 3.6-88	6-5
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B 3.6-92	6-5	B 3.6-132	3-4	B 3.7-30	0	B 3.8-37	115
B 3.6-93	115	B 3.6-133	3-4	B 3.7-31	115	B 3.8-38	110
B 3.6-94	143	B 3.6-134	2-8	B 3.8-1	0	B 3.8-39	102
B 3.6-95	6-5	B 3.6-135	143	B 3.8-2	5-3	B 3.8-40	102
B 3.6-96	159	B 3.6-136	6-2	B 3.8-3	0	B 3.8-41	3-2
B 3.6-97	159	B 3.6-137	2-8	B 3.8-4	153	B 3.8-42	0
B 3.6-98	161	B 3.6-138	2-8	B 3.8-4a	154	B 3.8-43	0
B 3.6-98a	161	B 3.6-139	2-8	B 3.8-5	154	B 3.8-44	0
B 3.6-99	159	B 3.6-140	2-8	B 3.8-6	154	B 3.8-45	155
B 3.6-100	161	B 3.6-141	2-8	B 3.8-7	154	B 3.8-46	0
B 3.6-101	121	B 3.6-142	2-8	B 3.8-8	154	B 3.8-47	0
B 3.6-102	121	B 3.7-1	110	B 3.8-8a	154	B 3.8-48	3-2
B 3.6-103	121	B 3.7-2	110	B 3.8-9	154	B 3.8-49	134
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B 3.6-105	110	B 3.7-4	1	B 3.8-11	154	B 3.8-51	125
B 3.6-106	0	B 3.7-5	1	B 3.8-12	154	B 3.8-51a	125
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B 3.6-110	6-5	B 3.7-8	143	B 3.8-15	139	B 3.8-53	161
B 3.6-111	6-5	B 3.7-9	161	B 3.8-16	151	B 3.8-53a	161
B 3.6-112	159	B 3.7-10	159	B 3.8-17	102	B 3.8-54	161
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B 3.6-114	6-5	B 3.7-12	132	B 3.8-18a	153	B 3.8-56	143
B 3.6-115	159	B 3.7-12a	161	B 3.8-19	157	B 3.8-57	120
B 3.6-116	143	B 3.7-13	161	B 3.8-20	143	B 3.8-58	161
B 3.6-117	0	B 3.7-13a	161	B 3.8-21	143	B 3.8-59	110
B 3.6-118	0	B 3.7-14	159	B 3.8-22	113	B 3.8-60	110
B 3.6-119	143	B 3.7-15	143	B 3.8-23	143	B 3.8-61	115
B 3.6-120	135	B 3.7-16	161	B 3.8-24	143	B 3.8-62	0
B 3.6-121	119	B 3.7-17	157	B 3.8-25	151	B 3.8-63	0
B 3.6-122	2-4	B 3.7-18	110	B 3.8-26	151	B 3.8-64	0
B 3.6-123	2-4	B 3.7-19	161	B 3.8-27	143	B 3.8-65	0
B 3.6-124	2-4	B 3.7-19a	161	B 3.8-28	143	B 3.8-66	1
B 3.6-125	2-4	B 3.7-20	115	B 3.8-29	143	B 3.8-67	4-5
B 3.6-126	2-4	B 3.7-21	161	B 3.8-30	143	B 3.8-68	4-5
B 3.6-127	2-4	B 3.7-22	0	B 3.8-31	102	B 3.8-69	1
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B 3.8-72a	161	B 3.9-21	115	B 3.10-26	0		
B 3.8-73	161	B 3.9-22	115	B 3.10-27	0		
B 3.8-74	110	B 3.9-23	119	B 3.10-28	0		
B 3.8-75	115	B 3.9-24	115	B 3.10-29	0		
B 3.8-76	110	B 3.9-25	0	B 3.10-30	0		
B 3.8-77	0	B 3.9-26	0	B 3.10-31	0		
B 3.8-78	0	B 3.9-27	4-2	B 3.10-32	0		
B 3.8-79	1	B 3.9-28	4-2	B 3.10-33	0		
B 3.8-80	0	B 3.9-28a	4-2	B 3.10-34	0		
B 3.8-81	0	B 3.9-29	0	B 3.10-35	0		
B 3.8-82	0	B 3.9-30	0	B 3.10-36	0		
B 3.8-83	0	B 3.9-31	4-2	B 3.10-37	0		
B 3.8-84	0	B 3.9-32	4-2	B 3.10-38	6-14		
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B 3.9-12	0	B 3.10-20	0				
B 3.9-13	0	B 3.10-21	0				
B 3.9-14	0	B 3.10-22	0				
B 3.9-15	0						
B 3.9-16	0						
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BASES

SR 3.0.3 (continued)

performed in accordance with SR 3.0.2, and not at the time that the specified Frequency was not met. This delay period is available provided the initial surveillance has been satisfactorily performed (Ref. NRC Task Interface Agreement TIA 2008-004). This delay period permits the completion of a Surveillance before complying with Required Actions or other remedial measures that might preclude completion of the Surveillance.

The basis for this delay period includes consideration of unit conditions, adequate planning, availability of personnel, the time required to perform the Surveillance, the safety significance of the delay in completing the required Surveillance, and the recognition that the most probable result of any particular Surveillance being performed is the verification of conformance with the requirements.

When a Surveillance with a Frequency based not on time intervals, but upon specified unit conditions, operating situations, or requirements of regulations (e.g., prior to entering MODE 1 after each fuel loading, or in accordance with 10CFR 50 Appendix J, as modified by approved exemptions, etc.) is discovered to not have been performed when specified, SR 3.0.3 allows the full delay period of up to the specified Frequency to perform the Surveillance. However, since there is not a time interval specified, the missed Surveillance should be performed at the first reasonable opportunity.

SR 3.0.3 provides a time limit for, and allowances for the performance of, Surveillances that become applicable as a consequence of MODE changes imposed by Required Actions.

Failure to comply with specified Frequencies for SRs is expected to be an infrequent occurrence. Use of the delay period established by SR 3.0.3 is a flexibility which is not intended to be used as an operational convenience to extend Surveillance intervals. While up to 24 hours or the limit of the specified Frequency is provided to perform the missed Surveillance, it is expected that the missed Surveillance will be performed at the first reasonable opportunity. The determination of the first reasonable opportunity should include consideration of the impact on plant risk (from delaying the Surveillance as well as any plant configuration changes required or shutting the plant down to perform the Surveillance) and impact on any analysis assumptions, in addition to unit conditions, planning, availability or personnel, and the time required to perform the Surveillance. This risk impact should be managed through

BASES

ACTIONS

B.1 (continued)

OPERABLE assemblies may then be used to power one RPS bus. The 1 hour Completion Time is sufficient for the plant operations personnel to take corrective actions and is acceptable because it minimizes risk while allowing time for restoration or removal from service of the electric power monitoring assemblies.

Alternately, if it is not desired to remove the power supply(s) from service (e.g., as in the case where removing the power supply(s) from service would result in a scram or isolation), Condition C or D, as applicable, must be entered and its Required Actions taken.

C.1

If any Required Action and associated Completion Time of Condition A or B are not met in MODE 1, 2, or 3, the plant must be brought to a MODE in which overall plant risk is minimized. The plant shutdown is accomplished by placing the plant in MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 3) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

Required Action C.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES

ACTIONS
(continued)

D.1

If any Required Action and associated Completion Time of Condition A or B are not met in MODE 4 or 5, with any control rod withdrawn from a core cell containing one or more fuel assemblies, the operator must immediately initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies (Required Action D.1). This Required Action results in the least reactive condition for the reactor core and ensures that the safety function of the RPS (e.g., scram of control rods) is not required.

All actions must continue until the applicable Required Actions are completed.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.8.2.3

Performance of a system functional test demonstrates a required system actuation (simulated or actual) signal. The logic of the system will automatically trip open the associated power monitoring assembly circuit breaker. Only one signal per power monitoring assembly is required to be tested. This Surveillance overlaps with the CHANNEL CALIBRATION to provide complete testing of the safety function. The system functional test of the Class 1E circuit breakers is included as part of this test to provide complete testing of the safety function. If the breakers are incapable of operating, the associated electric power monitoring assembly would be inoperable.

The 24 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.

REFERENCES

1. USAR, Section 8.3.1.1.3.
2. NRC Generic Letter 91-09, "Modification of Surveillance Interval for the Electric Protective Assemblies in Power Supplies for the Reactor Protection System."
3. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December, 2002.

BASES

ACTIONS (continued)

C.1

With two ECCS injection subsystems inoperable or one ECCS injection and one ECCS spray subsystem inoperable, at least one ECCS injection/spray subsystem must be restored to OPERABLE status within 72 hours. In this Condition, the remaining OPERABLE subsystems provide adequate core cooling during a LOCA. However, overall ECCS reliability is reduced in this Condition because a single failure in one of the remaining OPERABLE subsystems concurrent with a design basis LOCA may result in the ECCS not being able to perform its intended safety function. Since the ECCS availability is reduced relative to Condition A, a more restrictive Completion Time is imposed. The 72 hour Completion Time is based on a reliability study, as provided in Reference 12.

D.1

If any Required Action and associated Completion Time of Condition A, B, or C are not met, the plant must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 17) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

Required Action D.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

(continued)

BASES

ACTIONS
(continued)

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

E.1

The LCO requires seven ADS valves to be OPERABLE to provide the ADS function. Reference 11 contains the results of an analysis that evaluated the effect of one ADS valve being out of service. Per this analysis, operation of only six ADS valves will provide the required depressurization. However, overall reliability of the ADS is reduced because a single failure in the OPERABLE ADS valves could result in a reduction in depressurization capability. Therefore, operation is only allowed for a limited time. The 14 day Completion Time is based on a reliability study (Ref. 12) and has been found to be acceptable through operating experience.

(continued)

BASES

ACTIONS (continued)

F.1 and F.2

If any one low pressure ECCS injection/spray subsystem is inoperable in addition to one inoperable ADS valve, adequate core cooling is ensured by the OPERABILITY of HPCS and the remaining low pressure ECCS injection/spray subsystems. However, the overall ECCS reliability is reduced because a single active component failure concurrent with a design basis LOCA could result in the minimum required ECCS equipment not being available. Since both a portion of a high pressure (ADS) and a low pressure subsystem are inoperable, a more restrictive Completion Time of 72 hours is required to restore either the low pressure ECCS injection/spray subsystem or the ADS valve to OPERABLE status. This Completion Time is based on a reliability study (Ref. 12) and has been found to be acceptable through operating experience.

G.1

If any Required Action and associated Completion Time of Condition E or F are not met or if two or more ADS valves are inoperable, the plant must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 17) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

Required Action G.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

(continued)

BASES

ACTIONS
(continued)

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

H.1

When multiple ECCS subsystems are inoperable, as stated in Condition H, the plant is in a degraded condition not specifically justified for continued operation, and may be in a condition outside of the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

(continued)

BASES

REFERENCES

1. USAR, Section 6.3.2.2.3.
2. USAR, Section 6.3.2.2.4.
3. USAR, Section 6.3.2.2.1.
4. USAR, Section 6.3.2.2.2.
5. USAR, Section 15.2.8.
6. USAR, Section 15.6.4.
7. USAR, Section 15.6.5.
8. 10 CFR 50, Appendix K.
9. USAR, Section 6.3.3.
10. 10 CFR 50.46.
11. USAR, Section 6.3.3.3.
12. Memorandum from R.L. Baer (NRC) to V. Stello, Jr. (NRC), "Recommended Interim Revisions to LCO's for ECCS Components," December 1, 1975.
13. USAR, Section 5.2.2.4.1.
14. NEDO-32291-A, "System Analyses for Elimination of Selected Response Time Testing Requirements," January 1994.
15. RBS Technical Requirements Manual.
16. ASME OM Code for Operation and Maintenance of Nuclear Power Plants.
17. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.1.6 Low-Low Set (LLS) Valves

BASES

BACKGROUND

The safety/relief valves (S/RVs) can actuate either in the relief mode, the safety mode, the Automatic Depressurization System mode, or the LLS mode. In the LLS mode (one of the power actuated modes of operation), a pneumatic operator and mechanical linkage overcome the spring force and open the valve. The valve can be maintained open with valve inlet steam pressure as low as 0 psig. The pneumatic operator is arranged so that its malfunction will not prevent the valve disk from lifting if steam inlet pressure exceeds the safety mode pressure setpoints.

Five of the S/RVs are equipped to provide the LLS function. The LLS logic causes two LLS valves to be opened at a lower pressure than the relief or safety mode pressure setpoints and causes all the LLS valves to stay open longer, such that reopening of more than one S/RV is prevented on subsequent actuations. Therefore, the LLS function prevents excessive short duration S/RV cycles with valve actuation at the relief setpoint.

Each S/RV discharges steam through a discharge line and quencher to a location near the bottom of the suppression pool, which causes a load on the suppression pool wall. Actuation at lower reactor pressure results in a lower load.

APPLICABLE SAFETY ANALYSES

The LLS relief mode functions to ensure that the containment design basis of one S/RV operating on "subsequent actuations" is met (Ref. 1). In other words, multiple simultaneous openings of S/RVs (following the initial opening) and the corresponding higher loads, are avoided. The safety analysis demonstrates that the LLS functions to avoid the induced thrust loads on the S/RV discharge line resulting from "subsequent actuations" of the S/RV during Design Basis Accidents (DBAs). Furthermore, the LLS function justifies the primary containment analysis assumption that multiple simultaneous S/RV openings occur only on the initial actuation for DBAs. Even though five

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

LLS S/RVs are specified, all five LLS S/RVs do not operate in any DBA analysis.

LLS valves satisfy Criterion 3 of the NRC Policy Statement.

LCO

Five LLS valves are required to be OPERABLE to satisfy the assumptions of the safety analysis (Ref. 2). The requirements of this LCO are applicable to the mechanical and electrical/pneumatic capability of the LLS valves to function for controlling the opening and closing of the S/RVs.

APPLICABILITY

In MODES 1, 2, and 3, an event could cause pressurization of the reactor and opening of S/RVs. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining the LLS valves OPERABLE is not required in MODE 4 or 5.

ACTIONS

A.1

With one LLS valve inoperable, the remaining OPERABLE LLS valves are adequate to perform the designed function. However, the overall reliability is reduced. The 14 day Completion Time takes into account the redundant capability afforded by the remaining LLS S/RVs and the low probability of an event in which the remaining LLS S/RV capability would be inadequate.

B.1

If the inoperable LLS valve cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 4) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

(continued)

BASES

ACTIONS
(continued)

Required Action B.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

C.1 and C.2

If two or more LLS valves are inoperable, there could be excessive short duration S/RV cycling during an overpressure event. The plant must be brought to a condition in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.6.1 (continued)

frequency of the required relief-mode actuator testing was developed based on the tests required by ASME OM Code (ref. 3) as implemented by the Inservice Testing Program of Specification 5.5.6. The testing frequency required by the Inservice Testing Program is based on operating experience and valve performance. Therefore, the frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.1.6.2

The LLS designed S/RVs are required to actuate automatically upon receipt of specific initiation signals. A system functional test is performed to verify that the mechanical portions (i.e., solenoids) of the automatic LLS function operate as designed when initiated either by an actual or simulated automatic initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.4.4 overlaps this SR to provide complete testing of the safety function.

The 24 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.

This SR is modified by a Note that excludes valve actuation. This prevents a reactor pressure vessel pressure blowdown.

REFERENCES

1. GESSAR-II, Appendix 3B, Attachment A, Section 3BA.8.
2. USAR, Section 5.2.2.
3. ASME OM Code for Operation and Maintenance of Nuclear Power Plants.
4. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December, 2002.

BASES

ACTIONS (continued)

B.1

With two primary containment unit coolers inoperable, one unit cooler must be restored to OPERABLE status within 8 hours. In this condition, there is a substantial loss of the primary containment bypass leakage mitigation function. The 8 hour Completion Time is based on this loss of function and is considered acceptable due to the low probability of a DBA and because alternative methods to remove heat from primary containment are available.

C.1

If the inoperable primary containment unit cooler cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 2) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

Required Action C.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.7.1

Verifying the correct alignment for pressure relief and backdraft dampers in the primary containment unit cooler ventilation flow path provides assurance that the proper flow paths will exist for system operation. This SR does not apply to dampers that are locked, sealed, or otherwise secured in position, since these were verified to be in the correct position prior to locking, sealing, or securing. This SR does not require any testing or damper manipulation; rather, it involves verification that those dampers capable of being mispositioned are in the correct position.

The 31 day Frequency of this SR is justified because the dampers are operated under procedural control and because improper positioning would affect only a single unit cooler. This Frequency has been shown to be acceptable based on operating experience.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.7.2

Verifying each unit cooler develops a flow rate ≥ 50,000 cfm ensures overall performance has not degraded during the cycle. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this SR is consistent with that applied to pumps by the Inservice Testing Program.

SR 3.6.1.7.3

This SR verifies that each primary containment unit cooler actuates upon receipt of an actual or simulated automatic actuation signal throughout its' emergency operating sequence and that the pressure relief and backdraft damper in the flow path actuates to its' correct position. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.3.5 overlaps this SR to provide complete testing of the safety function. The 24 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.

REFERENCES

1. USAR, Section 6.2.1.1.3.4.

2. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

BASES

APPLICABILITY (continued)

and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining the MS-PLCS OPERABLE is not required in MODE 4 or 5 to ensure MSIV leakage is processed.

ACTIONS

A.1

With one MS-PLCS subsystem inoperable, the inoperable MS-PLCS subsystem must be restored to OPERABLE status within 30 days. In this Condition, the remaining OPERABLE MS-PLCS subsystem is adequate to perform the required leakage control function. However, the overall reliability is reduced because a single failure in the remaining subsystem could result in a total loss of MSIV leakage control function. The 30 day Completion Time is based on the redundant capability afforded by the remaining OPERABLE MS-PLCS subsystem and the low probability of a DBA LOCA occurring during this period.

B.1

With two MS-PLCS subsystems inoperable, at least one subsystem must be restored to OPERABLE status within 7 days. The 7 day Completion Time is based on the low probability of the occurrence of a DBA LOCA.

C.1

If the MS-PLCS subsystem cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 3) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

Required Action C.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

(continued)

BASES

ACTIONS (continued)

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.1.9.1

The minimum air supply necessary for MS-PLCS OPERABILITY varies with the system being supplied with compressed air

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.1.9.1 (continued)

from the PVLCS accumulators. Due to the support system function of PVLCS for S/RV actuator air, however, the specified minimum pressure of 101 psig is required, which provides sufficient air for intermediate and long term post-LOCA S/RV actuations. This minimum air pressure alone is sufficient for PVLCS to support the OPERABILITY of these S/RV systems and is verified every 24 hours. The 24 hour Frequency is considered adequate in view of other indications available in the control room, such as alarms, to alert the operator to an abnormal PVLCS air pressure condition.

SR 3.6.1.9.2

Each PVLCS compressor is operated for ≥ 15 minutes to verify MS-PLCS OPERABILITY. The 31 day Frequency was developed considering the known reliability of the PVLCS compressor and controls, the two subsystem redundancy, and the low probability of a significant degradation of the MS-PLCS subsystem occurring between surveillances and has been shown to be acceptable through operating experience.

SR 3.6.1.9.3

A system functional test is performed to ensure that the MS-PLCS will operate through its operating sequence. The 24 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.

REFERENCES

1. USAR, Section 6.7.
2. USAR, Section 15.6.5.
3. NEDC-32988, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

BASES

ACTIONS (continued)

B.1

If one RHR suppression pool cooling subsystem is inoperable and is not restored to OPERABLE status within the required Completion Time, the plant must be brought to a condition in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 3) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

Required Action B.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

C.1

With two RHR suppression pool cooling subsystems inoperable, one subsystem must be restored to OPERABLE status within 8 hours. In this condition, there is a substantial loss of the primary containment pressure and temperature mitigation function. The 8 hour Completion Time is based on this loss of function and is considered acceptable due to the low probability of a DBA and the potential avoidance of a plant shutdown transient that could result in the need of the RHR suppression pool cooling subsystems to operate.

(continued)

BASES

ACTIONS (continued)

D.1 and D.2

If the Required Action and required Completion Time of Condition C cannot be met or if two RHR suppression pool cooling subsystems are inoperable, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.2.3.1

Verifying the correct alignment for manual, power operated, and automatic valves, in the RHR suppression pool cooling mode flow path provides assurance that the proper flow path exists for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to being locked, sealed, or secured. A valve is also allowed to be in the nonaccident position, provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable, since the RHR suppression pool cooling mode is manually initiated. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The Frequency of 31 days is justified because the valves are operated under procedural control, improper valve position would affect only a single subsystem, the probability of an event requiring initiation of the system is low, and the subsystem is a manually initiated system. This Frequency has been shown to be acceptable, based on operating experience.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.2.3.2

Verifying each RHR pump develops a flow rate ≥ 5050 gpm, with flow through the associated heat exchanger to the suppression pool ensures that pump performance has not degraded during the cycle. Flow is a normal test of centrifugal pump performance required by ASME OM Code (Ref. 2). This test confirms one point on the pump design curve, and the results are indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

REFERENCES

1. USAR, Section 6.2.

2. ASME OM Code for Operation and Maintenance of Nuclear Power Plants.

3. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

BASES

LCO (continued)

auxiliary building, can be diluted and processed prior to release to the environment. For the secondary containment to be considered OPERABLE, it must have adequate leak tightness to ensure that the required vacuum can be established and maintained.

APPLICABILITY

In MODES 1, 2, and 3, a LOCA could lead to a fission product release to primary containment that leaks to secondary containment. Therefore, secondary containment OPERABILITY is required during the same operating conditions that require primary containment OPERABILITY.

In MODES 4 and 5, the probability and consequences of the LOCA are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining secondary containment OPERABLE is not required in MODE 4 or 5 to ensure a control volume, except for other situations for which significant releases of radioactive material can be postulated, such as during movement of irradiated fuel assemblies in the fuel building. The fuel building OPERABILITY during recently irradiated fuel handling is addressed in LCO 3.6.4.7, "Fuel Building Ventilation Systems-Fuel Handling."

ACTIONS

A.1

If secondary containment is inoperable, it must be restored to OPERABLE status within 4 hours. The 4 hour Completion Time provides a period of time to correct the problem that is commensurate with the importance of maintaining secondary containment during MODES 1, 2, and 3. This time period also ensures that the probability of an accident (requiring secondary containment OPERABILITY) occurring during periods where secondary containment is inoperable is minimal.

B.1

If the secondary containment cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 3) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

(continued)

BASES

ACTIONS
(continued)

Required Action B.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1.1

This SR ensures that the shield building annulus and auxiliary building is sufficiently leak tight to preclude exfiltration under expected wind conditions. The 24 hour Frequency of this SR was developed based on operating experience related to secondary containment vacuum variations during the applicable MODES and the low probability of a DBA occurring between surveillances.

Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal secondary containment vacuum condition.

SR 3.6.4.1.2 and SR 3.6.4.1.3

Verifying that secondary containment equipment hatches are closed/installed and access doors are closed ensures that the infiltration of outside air of such a magnitude as to prevent maintaining the desired negative pressure does not occur. Verifying that all such openings are closed provides adequate assurance that exfiltration from the secondary containment will not occur. In this application the term "sealed" has no connotation of leak tightness, rather inadvertent opening is prevented. Maintaining secondary containment OPERABILITY requires verifying each door in the access opening is closed, except when the access opening is being used for entry and exit. Verifying the main plant exhaust duct drain loop seal and the turbine building/auxiliary building exhaust duct drain loop seals are full of water also prevents infiltration of outside air and exfiltration from the secondary containment. The 31 day Frequency for these SRs has been shown to be adequate based on operating experience, and is considered adequate in view of the other controls on secondary containment access openings.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1.4 and SR 3.6.4.1.6

The SGT System exhausts the shield building annulus and auxiliary building atmosphere to the environment through appropriate treatment equipment. To ensure that all fission products are treated, SR 3.6.4.1.4 verifies that the SGT System will rapidly establish and maintain a pressure in the shield building annulus and auxiliary building that is less than the lowest postulated pressure external to the secondary containment boundary. This is confirmed by demonstrating that one SGT subsystem will draw down the shield building annulus and auxiliary building to ≥ 0.5 and ≥ 0.25 inches of vacuum water gauge in ≤ 18.5 and ≤ 34.5 seconds, respectively. This cannot be accomplished if the secondary containment boundary is not intact. SR 3.6.4.1.6 demonstrates that each SGT subsystem can maintain ≥ 0.5 and ≥ 0.25 inches of vacuum water gauge for 1 hour. The 1 hour test period allows shield building annulus and auxiliary building to be in thermal equilibrium at steady state conditions. Therefore, these two tests are used to ensure the integrity of this portion of the secondary containment boundary. Since these SRs are secondary containment tests, they need not be performed with each SGT subsystem. The SGT subsystems are tested on a STAGGERED TEST BASIS, however, to ensure that in addition to the requirements of LCO 3.6.4.3, either SGT subsystem will perform this test.

REFERENCES

1. USAR, Section 15.6.5.

2. USAR, Section 15.7.4

3. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

BASES

APPLICABILITY

In MODES 1, 2, and 3, a DBA could lead to a fission product release to primary containment that leaks to secondary containment. Therefore, SGT System OPERABILITY is required during these MODES.

In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining the SGT System OPERABLE is not required in MODE 4 or 5.

ACTIONS

A.1 and A.2

With one SGT subsystem inoperable, action must be taken to verify that the OPERABLE SGT subsystem is not operating in the primary containment purge flowpath.

Additionally, the inoperable subsystem must be restored to OPERABLE status within 7 days. In this Condition, the remaining OPERABLE SGT subsystem is adequate to perform the required radioactivity release control function. However, the overall system reliability is reduced because a single failure in the OPERABLE subsystem could result in the radioactivity release control function not being adequately performed. The 7 day Completion Time is based on consideration of such factors as the availability of the OPERABLE redundant SGT subsystem and the low probability of a DBA occurring during this period.

B.1

If the SGT subsystem cannot be restored to OPERABLE status within the required Completion Time in MODE 1, 2, or 3, the plant must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 5) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

(continued)

BASES

ACTIONS
(continued)

Required Action B.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

C.1

If both SGT subsystems are inoperable in MODE 1, 2, or 3, the SGT system may not be capable of supporting the required radioactivity release control function. Therefore, actions are required to enter LCO 3.0.3 immediately. Therefore, the plant must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 5) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

Required Action C.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction for LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.4.3.4 (continued)

available.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 41.
2. USAR, Section 6.2.3.
3. USAR, Section 15.6.5.
4. Regulatory Guide 1.52, Rev. 2.
5. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

BASES

ACTIONS (continued)

G.1

If one SSW subsystem is inoperable for reasons other than Condition E or F, it must be restored to OPERABLE status within 72 hours. With the unit in this condition, the remaining OPERABLE SSW subsystem is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE SSW subsystem could result in loss of SSW function. The 72 hour Completion Time was developed taking into account the redundant capabilities afforded by the OPERABLE subsystem and the low probability of a DBA occurring during this period.

The Required Action is modified by two Notes indicating that the applicable Conditions of LCO 3.8.1, "AC Sources -Operating," and LCO 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown," be entered and the Required Actions taken if the inoperable SSW subsystem results in an inoperable DG or RHR shutdown cooling subsystem, respectively. This is in accordance with LCO 3.0.6 and ensures the proper actions are taken for these components.

H.1

If any Required Action and associated Completion Time of Condition A, C, E, or G are not met, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours.

Required Action H.1 is modified by a Note that states LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Time is 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)

I.1 and I.2

If any Required Action and associated Completion Time of Condition B, D, or F are not met, or both SSW subsystems are inoperable, or three or four UHS cooling tower fan cells are inoperable, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

This SR ensures adequate long term (30 days) cooling can be maintained. With the UHS water source below the minimum level, the affected SSW subsystem must be declared

(continued)

BASES

REFERENCES (continued)

5. USAR, Chapter 15.
6. USAR, Section 6.2.2.
7. USAR, Table 6.2-2.
8. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

BASES

ACTIONS (continued)

implementation upon entry into the condition, regardless of whether entry is intentional or unintentional. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of mitigating actions. The 90 day Completion Time is reasonable based on the determination that the mitigating actions will ensure protection of CRE occupants within analyzed limits while limiting the probability that CRE occupants will have to implement protective measures that may adversely affect their ability to control the reactor and maintain it in a safe shutdown condition in the event of a DBA. In addition, the 90 day Completion Time is a reasonable time to diagnose, plan and possibly repair, and test most problems with the CRE boundary.

C.1

In MODE 1, 2, or 3, if the inoperable CRFA subsystem or the CRE boundary cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes overall plant risk. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 11) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

Required Action C.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Time is 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, D.2.1, and D.2.2

The Required Actions of Condition D are modified by a Note indicating that LCO 3.0.3 does not apply. If moving recently irradiated fuel assemblies while in MODE 1, 2, or 3, the

(continued)

BASES

ACTIONS

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

fuel movement is independent of reactor operations. Therefore, inability to suspend movement of recently irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

During movement of recently irradiated fuel assemblies in the primary containment or fuel building or during OPDRVs, if the inoperable CRFA subsystem cannot be restored to OPERABLE status within the required Completion Time, the OPERABLE CRFA subsystem may be placed in the emergency mode. This action ensures that the remaining subsystem is OPERABLE, that no failures that would prevent automatic actuation will occur, and that any active failure will be readily detected.

An alternative to Required Action D.1 is to immediately suspend activities that present a potential for releasing radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk.

If applicable, movement of recently irradiated fuel assemblies in the primary containment or fuel building must be suspended immediately. Suspension of these activities shall not preclude completion of movement of a component to a safe position. Also, if applicable, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.

E.1

If both CRFA subsystems are inoperable in MODE 1, 2, or 3, for reasons other than an inoperable CRE, the CRFA System may not be capable of performing the intended function and the unit is in a condition outside of the accident analyses.

Therefore, the plant must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 11) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

(continued)

BASES

ACTIONS
(continued)

Required Action E.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES (continued)

REFERENCES

1. USAR, Section 6.4.1.
2. USAR, Section 9.4.1.
3. USAR, Chapter 6.
4. USAR, Chapter 15.
5. USAR, Chapter 6.4
6. USAR, Chapter 9.5
7. Regulatory Guide 1.196
8. NEI 99-03, "Control Room Habitability Assessment," June 2001
9. Letter from Eric J. Leeds (NRC) to James W. Davis (NEI) dated January 30, 2004, "NEI Draft White Paper, Use of Generic Letter 91-18 Process and Alternative Source Terms in the Context of Control Room Habitability." (ADAMS Accession No. ML040300694).
10. 10CFR50.67.
11. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

BASES

ACTIONS

A.1 (continued)

function. The 30 day Completion Time is based on the low probability of an event occurring requiring control room isolation, the consideration that the remaining subsystem can provide the required protection, and the availability of alternate cooling methods.

B.1 and B.2

If both control room AC subsystems are inoperable, the Control Room AC System may not be capable of performing its intended function. Therefore, the control room area temperature is required to be monitored once per 4 hours to ensure that temperature is being maintained low enough that equipment in the control room is not adversely affected. With the control room temperature being maintained within the temperature limit, 7 days is allowed to restore a control room AC subsystem to OPERABLE status. These Completion Times are reasonable considering that the control room temperature is being maintained within limits, the low probability of an event occurring requiring control room isolation, and the availability of alternate cooling methods.

C.1

In MODE 1, 2, or 3, if the control room area temperature cannot be maintained ≤ 104°F or if the inoperable control room AC subsystem cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE that minimizes risk. To achieve this status the unit must be placed in at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 3) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

Required Action C.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

(continued)

BASES

ACTIONS (continued)

The allowed Completion Time is 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, D.2.1, and D.2.2

The Required Actions of Condition C are modified by a Note indicating that LCO 3.0.3 does not apply.

(continued)

BASES

ACTIONS

E.1 and E.2 (continued)

not preclude completion of movement of a component to a safe position. Also, if applicable, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1

This SR verifies that the heat removal capability of the system is sufficient to remove the control room heat load assumed in the safety analysis. The SR consists of a combination of testing and calculation. The 24 month Frequency is appropriate since significant degradation of the Control Room AC System is not expected over this time period.

REFERENCES

1. USAR, Section 6.4.
2. USAR, Section 9.4.1.
3. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

BASES (continued)

APPLICABILITY

The LCO is applicable when steam is being exhausted to the main condenser and the resulting noncondensibles are being processed via the Main Condenser Offgas System. This occurs during MODE 1, and during MODES 2 and 3 with any main steam line not isolated and the SJAE in operation. In MODES 4 and 5, steam is not being exhausted to the main condenser and the requirements are not applicable.

ACTIONS

A.1

If the offgas radioactivity rate limit is exceeded, 72 hours is allowed to restore the gross gamma activity rate to within the limit. The 72 hour Completion Time is reasonable, based on engineering judgment considering the time required to complete the Required Action, the large margins associated with permissible dose and exposure limits, and the low probability of a Main Condenser Offgas System rupture occurring.

B.1, B.2, and B.3

If the gross gamma activity rate is not restored to within the limits within the associated Completion Time, all main steam lines or the SJAE must be isolated. This isolates the Main Condenser Offgas System from the source of the radioactive steam. The main steam lines are considered isolated if at least one main steam isolation valve in each main steam line is closed, and at least one main steam line drain valve in each drain line is closed. The 12 hour Completion Time is reasonable, based on operating experience, to perform the actions from full power conditions in an orderly manner and without challenging unit systems.

An alternative to Required Actions B.1 and B.2 is to place the unit in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 4) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

Required Action B.3 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

(continued)

BASES (continued)

The allowed Completion Time is 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 3.7.4.1

This SR requires an isotopic analysis of an offgas sample if the measured release rate of radioactivity increases significantly (by ≥ 50% after correcting for expected increases due to changes in THERMAL POWER), within 4 hours after the increase is noted, to ensure that the increase is not indicative of a sustained increase in the radioactivity rate. The noble gases to be sampled are Xe-133, Xe-133m, Xe-135, Xe-138, Kr-85m, Kr-87, and Kr-88.

SR 3.7.4.2

This SR, on a 31 day Frequency, requires an isotopic analysis of an offgas sample to ensure that the required limits are satisfied. The noble gases to be sampled are Xe-133, Xe-133m, Xe-135, Xe-138, Kr-85m, Kr-87, and Kr-88. The 31 day Frequency is adequate in view of other instrumentation that continuously monitor the offgas, and is acceptable based on operating experience.

This SR is modified by a Note indicating that the SR is not required to be performed until 31 days after any main steam line is not isolated and the SJAE is in operation. Only in this condition can radioactive fission gases be in the Main Condenser Offgas System at significant rates.

REFERENCES

1. USAR, Section 15.7.1.
2. NUREG-0800.
3. 10 CFR 100.
4. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

BASES

ACTIONS (continued)

G.1

If the inoperable AC electrical power sources cannot be restored to OPERABLE status within the associated 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 MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 16) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

Required Action G.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

H.1

Condition H 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.

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 10 CFR 50, GDC 18 (Ref. 8). 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 in accordance with the

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

recommendations of Regulatory Guide 1.9 (Ref. 3), Regulatory Guide 1.108 (Ref. 9), and Regulatory Guide 1.137 (Ref. 10).

Where the SRs discussed herein specify voltage and frequency tolerances, the minimum and maximum steady state output voltage of 3740 V and 4580 V respectively, are equal to ± 10% of the nominal 4160 V output voltage. The specified minimum and maximum frequencies of the DG of 58.8 Hz and 61.2 Hz, respectively, are equal to ± 2% of the 60 Hz nominal frequency. The specified steady state voltage and frequency ranges are derived from the recommendations given in Regulatory Guide 1.9 (Ref. 3).

(continued)

BASES

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. USAR, Chapter 8.
3. Regulatory Guide 1.9.
4. USAR, Chapter 6.
5. USAR, Chapter 15.
6. Regulatory Guide 1.93.
7. Generic Letter 84-15, July 2, 1984.
8. 10 CFR 50, Appendix A, GDC 18.
9. Regulatory Guide 1.108.
10. Regulatory Guide 1.137.
11. ANSI C84.1, 1982.
12. ASME, Boiler and Pressure Vessel Code, Section XI.
13. IEEE Standard 308.
14. 10 CFR 50.65.
15. Regulatory Guide 1.160.
16. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December, 2002.

(continued)

BASES

ACTIONS

B.1 (continued)

loss of DC power to the affected division. The 2 hour limit is consistent with the allowed time for an inoperable DC distribution system division.

If one of the required Division I or II DC electrical power subsystems is inoperable for reasons other than Condition A (e.g., inoperable battery, or inoperable battery charger and associated inoperable battery), the remaining DC electrical power subsystems have the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst case single failure could, however, result in the loss of minimum necessary DC electrical subsystems, continued power operation should not exceed 2 hours. The 2 hour Completion Time is based on Regulatory Guide 1.93 (Ref. 7) and 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.

C.1

With the Division III DC electrical power subsystem inoperable, the HPCS and Standby Service Water System pump 2C may be incapable of performing their intended functions and must be immediately declared inoperable. This declaration also requires entry into applicable Conditions and Required Actions of LCO 3.5.1, "ECCS – Operating," and LCO 3.7.1, "Standby Service Water (SSW) System and Ultimate Heat Sink (UHS)."

D.1

If the inoperable DC electrical power subsystem cannot be restored to OPERABLE status within the associated Completion Time, the unit must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours.

If a Division 1 or 2 DC electrical power subsystem is inoperable and not restored within the provided Completion Time, the plant must be brought to a condition in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 12) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

(continued)

BASES

ACTIONS
(continued)

Required Action D.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge 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 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 conservative with manufacturer's recommendations and IEEE-450 (Ref. 8).

SR 3.8.4.2

Visual inspection to detect corrosion of the battery cells and connections, or measurement of the resistance of each inter-cell, inter-rack, inter-tier, and terminal connection, provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. Only those terminals and connectors which have visible corrosion must be measured for connection resistance.

The Surveillance Frequency for these inspections, which can detect conditions that can cause power losses due to resistance heating, is 92 days. This Frequency is considered acceptable based on operating experience related to detecting corrosion trends.

SR 3.8.4.3

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.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.8 (continued)

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post corrective maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. Regulatory Guide 1.6, March 10, 1971.
3. IEEE Standard 308, 1978.
4. USAR, Section 8.3.2.
5. USAR, Chapter 6.
6. USAR, Chapter 15.
7. Regulatory Guide 1.93, December 1974.
8. IEEE Standard 450, 1995.
9. Regulatory Guide 1.32, February 1977.
10. Regulatory Guide 1.129, December 1974.
11. IEEE Standard 485.
12. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

BASES

ACTIONS (continued)

A.1

Required Action A.1 allows 24 hours to fix the inoperable inverter and return it to service or align an OPERABLE inverter to the Vital Bus. The 24 hour limit is based upon engineering judgment, taking into consideration the time required to repair an inverter and the additional risk to which the plant is exposed because of the inverter inoperability. This risk has to be balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems that such a shutdown might entail. When the AC vital bus is powered from one of its Class 1E sources, it is relying upon interruptible AC electrical power sources (offsite and onsite). The uninterruptible inverter source to the AC vital buses is the preferred source for powering instrumentation trip setpoint devices.

B.1

If the inoperable devices or components cannot be restored to OPERABLE status within the associated Completion Time, the plant must be brought to a condition in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 4) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

Required Action B.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

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)

BASES (continued)

REFERENCES

1. USAR, Chapter 8.

2. USAR, Chapter 6.

3. USAR, Chapter 15.

4. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

BASES

ACTIONS

C.1 (continued)

b. The potential for decreased safety when requiring entry into numerous applicable Conditions and Required Actions for components without DC power while not providing sufficient time for the operators to perform the necessary evaluations and actions for restoring power to the affected division; 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. 3).

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 been not met for up to 8 hours. This situation could lead to a total duration of 10 hours, since initial failure of the LCO, to restore the DC distribution system. At this time, an AC division could again become inoperable, and DC distribution could be 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 allowance results 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 of failing to meet the LCO indefinitely.

D.1

If the inoperable electrical power distribution system cannot be restored to OPERABLE status within the associated Completion Times, the plant must be brought to a MODE in which overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours.

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 5) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

(continued)

BASES

ACTIONS
(continued)

Required Action D.1 is modified by a Note that states that LCO 3.0.4.a is not applicable when entering MODE 3. This Note prohibits the use of LCO 3.0.4.a to enter MODE 3 during startup with the LCO not met. However, there is no restriction on the use of LCO 3.0.4.b, if applicable, because LCO 3.0.4.b requires performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering MODE 3, and establishment of risk management actions, if appropriate. LCO 3.0.4 is not applicable to, and the Note does not preclude, changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES

ACTIONS

E.1

With the Division III electrical power distribution system inoperable, the Division III powered systems are not capable of performing their intended functions. Immediately declaring the high pressure core spray inoperable allows the ACTIONS of LCO 3.5.1, "ECCS - Operating," to apply appropriate limitations on continued reactor operation.

F.1

Condition F corresponds to a level of degradation in the electrical distribution system that causes a required safety function to be lost. When more than one Condition is entered, and this results in the loss of a required function, the plant is in a condition outside the accident analysis. Therefore, no additional time is justified for continued operation. LCO 3.0.3 must be entered immediately to commence a controlled shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

Meeting this Surveillance verifies that the 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. The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC vital bus electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.

(continued)

BASES (continued)

REFERENCES

1. USAR, Chapter 6.

2. USAR, Chapter 15.

3. Regulatory Guide 1.93, December 1974.

4. USAR, Section 8.3.

5. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.