MARK UP OF ITS CHANGE

OI 3.8-04; Deletion of NOTES modifying Zion CTS Section 3.15.2.A and Section 4.15.2.A

The NOTES modifying Section 3.15.2.A and Section 4.15.2.A of the Zion CTS are being deleted. They were only applicable until the installion of a modification, which will be completed following the current refueling outage (Z2R14) and prior to implementation of ITS.

~~3.8 ELECTRICAL POWER SYSTEMS~~

~~3.8.11 AC Sources Special Exception~~

~~LCO 3.8.11~~ ~~LCO 3.8.1, "AC Sources—Operating," requirement for the reserve offsite feed to be OPERABLE may be suspended on a one-time basis during the performance of Modification M22-1(2)-93-001B on the reserve offsite feed, provided:~~

~~a. The main offsite feed, two unit-specific DGs, and the common DG are OPERABLE; and~~

~~b. The unit-specific reserve offsite feed is restored to OPERABLE status within 14 days.~~

~~APPLICABILITY:~~ ~~MODES 1, 2, 3, and 4 during inoperability of the reserve offsite feed.~~

~~ACTIONS~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~A. Main offsite feed, one or more unit-specific DGs, or common DG inoperable.~~	~~NOTE~~ ~~LCO 3.8.1 ACTIONS for the inoperable reserve offsite feed also apply.~~ ~~A.1 Enter applicable Conditions of LCO 3.8.1.~~	 ~~Immediately~~
~~B. Unit-specific reserve offsite feed inoperable > 14 days.~~	~~B.1 Be in MODE 3.~~ AND ~~B.2 Be in MODE 5.~~	~~6 hours~~ ~~36 hours~~

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE~~		~~FREQUENCY~~
~~SR 3.8.11.1~~	~~Perform the following SRs for each unit specific and common DG:~~ ~~SR 3.8.1.2, SR 3.8.1.3, SR 3.8.1.5, and SR 3.8.3.3.~~	~~Once within 24 hours prior to removing reserve offsite feed from service~~
~~SR 3.8.11.2~~	~~Perform SR 3.8.1.1 for the main offsite feed.~~	~~Once within 1 hour prior to removing reserve offsite feed from service~~

~~B 3.8 ELECTRICAL POWER SYSTEMS~~

~~B 3.8.11 AC SOURCES Special Exception~~

~~BASES~~

~~BACKGROUND~~

~~The primary purpose of the AC Sources special exception is to permit installation and testing of high speed overcurrent protection relays on the secondary (low voltage) side of the System Auxiliary Transformer (SAT) for each unit. Since the unit SAT provides the reserve source of offsite power for the opposite unit, which may be operating, the opposite unit will not be in compliance with the LCO 3.8.1 requirement for two OPERABLE offsite feeds. However, the modification cannot be completed within the allowed 72 hour Completion Time of LCO 3.8.1, Required Action A.3.~~

~~APPLICABLE SAFETY ANALYSES~~

~~Operations within the special exception will require operating the unit under additional compensatory conditions for short periods of time with less than the normally required AC Sources. As such, these operations are not covered by any safety analysis calculations.~~

~~A probabilistic comparison was performed of the core damage frequency due to extending the Completion Time to 14 days with the core damage frequency from manually shutting down the reactor after 72 hours. The PRA results indicate the risk of continuing to operate the unit for a total of 14 days is not significantly greater than that of shutting down the reactor after 72 hours. The risk of operating an additional 11 days was also found not to be risk significant when determining the probability of total core damage.~~

~~During this special exception, LCO 3.8.1 requirement for two offsite feeds to be OPERABLE is revised to only require one offsite feed to be OPERABLE. This special exception LCO replaces the LCO requirement for an OPERABLE reserve offsite feed with provisions to account for the time necessary to install and test the required modifications.~~

~~(continued)~~

~~BASES (continued)~~

~~LCO~~

~~This special exception LCO provides an exception to the OPERABILITY requirements of LCO 3.8.1 for the reserve offsite feed under controlled, one time conditions for each unit. That is, once this special exception is utilized for the first time on each unit, further use would be precluded.~~

~~The requirements imposed during this exception consist of: 1) a requirement that all other AC Sources (i.e., the main offsite feed, two unit specific DGs, and the common DG) be OPERABLE prior to causing the inoperability of the reserve offsite feed, as well as any time during the inoperability of the reserve offsite feed; and 2) that the reserve offsite feed be inoperable for ≤ 14 days.~~

~~If after entering the Applicability of this special exception, another AC Source becomes inoperable, the ACTIONS of LCO 3.8.1 would be entered for all inoperable offsite sources, and the exception to the reserve offsite feed would be eliminated (refer to the Bases for Required Action A.1 of this LCO). However, in the event all AC Sources except the reserve offsite feed are restored to OPERABLE status, continuation of the one time use of the special exception would be allowed.~~

~~APPLICABILITY~~

~~This LCO is applicable in MODES 1, 2, 3, and 4 only during installation of modification M22-1(2)-93-001B, from the time that the reserve offsite feed is made inoperable.~~

~~ACTIONS~~

~~A.1~~

~~With the main offsite feed, one or more unit specific DGs, or the common DG inoperable, the required provisions of this special exception are not met. Therefore, Required Action A.1 requires that the applicable Conditions of LCO 3.8.1 be entered. This action is modified by a Note that requires the ACTIONS of LCO 3.8.1 be applied to the reserve offsite feed as well as the inoperable main offsite feed, unit specific DG(s), or the common DG.~~

~~(continued)~~

BASES

ACTIONS ~~(continued)~~

~~B.1 and B.2~~

~~With the unit specific reserve offsite feed inoperable for > 14 days, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.~~

~~SURVEILLANCE REQUIREMENTS~~

~~SR 3.8.11.1~~

~~Performance of the identified SRs to verify the redundant, onsite AC sources of power are available within 24 hours prior to initiating the modification verifies that the reserve offsite feed is not removed from service with existing degradation in the AC sources.~~

~~SR 3.8.11.2~~

~~Performance of the identified SR to verify the redundant, offsite AC source of power is available within 1 hour prior to initiating the modification verifies that the reserve offsite feed is not removed from service with existing degradation in the AC sources.~~

~~REFERENCES~~ ~~None.~~

DOC CHANGES

NSHC	NO.	DISCUSSION
A.	56.	The NOTES modifying Zion CTS Sections 3.15.2.A and 4.15.2.A, related to Modification M22-1-93-008 for Unit 1 and Modification M22-2-93-001B for Unit 2, are deleted from the ITS submittal. The modifications have been completed, therefore the provisions no longer are applicable and the deletion therefore is considered an administrative change.

NUREG MARKUPS

3.8 ELECTRICAL POWER SYSTEMS

3.8.11 AC Sources Special Exception

LCO 3.8.11 LCO 3.8.1, "AC Sources – Operating," requirement for the reserve offsite feed to be OPERABLE may be suspended on a one-time basis during the performance of Modification M22-1(2)-93-001B on the reserve offsite feed, provided:

a. The main offsite feed, two unit-specific DGs, and the common DG are OPERABLE; and

b. The unit-specific reserve offsite feed is restored to OPERABLE status within 14 days.

APPLICABILITY: MODES 1, 2, 3, and 4 during inoperability of the reserve offsite feed.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Main offsite feed, one or more unit-specific DGs, or common DG inoperable.	-------------NOTE------------ LCO 3.8.1 ACTIONS for the inoperable reserve offsite feed also apply. ------------------------------------ A.1 Enter applicable Conditions of LCO 3.8.1.	 Immediately
B. Unit-specific reserve offsite feed inoperable > 14 days.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.11.1	Perform the following SRs for each unit-specific and common DG: SR 3.8.1.2, SR 3.8.1.3, SR 3.8.1.5, and SR 3.8.3.3.	Once within 24 hours prior to removing reserve offsite feed from service
SR 3.8.11.2	Perform SR 3.8.1.1 for the main offsite feed.	Once within 1 hour prior to removing reserve offsite feed from service

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.11 AC SOURCES Special Exception

BASES

BACKGROUND	The primary purpose of the AC Sources special exception is to permit installation and testing of high speed overcurrent protection relays on the secondary (low voltage) side of the System Auxiliary Transformer (SAT) for each unit. Since the unit SAT provides the reserve source of offsite power for the opposite unit, which may be operating, the opposite unit will not be in compliance with the LCO 3.8.1 requirement for two OPERABLE offsite feeds. However, the modification cannot be completed within the allowed 72 hour Completion Time of LCO 3.8.1, Required Action A.3.
APPLICABLE SAFETY ANALYSES	Operations within the special exception will require operating the unit under additional compensatory conditions for short periods of time with less than the normally required AC Sources. As such, these operations are not covered by any safety analysis calculations. A probabilistic comparison was performed of the core damage frequency due to extending the Completion Time to 14 days with the core damage frequency from manually shutting down the reactor after 72 hours. The PRA results indicate the risk of continuing to operate the unit for a total of 14 days is not significantly greater than that of shutting down the reactor after 72 hours. The risk of operating an additional 11 days was also found not to be risk significant when determining the probability of total core damage. During this special exception, LCO 3.8.1 requirement for two offsite feeds to be OPERABLE is revised to only require one offsite feed to be OPERABLE. This special exception LCO replaces the LCO requirement for an OPERABLE reserve offsite feed with provisions to account for the time necessary to install and test the required modifications.

(continued)

BASES (continued)

LCO

This special exception LCO provides an exception to the OPERABILITY requirements of LCO 3.8.1 for the reserve offsite feed under controlled, one-time conditions for each unit. That is, once this special exception is utilized for the first time on each unit, further use would be precluded.

The requirements imposed during this exception consist of: 1) a requirement that all other AC Sources (i.e., the main offsite feed, two unit-specific DGs, and the common DG) be OPERABLE prior to causing the inoperability of the reserve offsite feed, as well as any time during the inoperability of the reserve offsite feed; and 2) that the reserve offsite feed be inoperable for ≤ 14 days.

If after entering the Applicability of this special exception, another AC Source becomes inoperable, the ACTIONS of LCO 3.8.1 would be entered for all inoperable offsite sources, and the exception to the reserve offsite feed would be eliminated (refer to the Bases for Required Action A.1 of this LCO). However, in the event all AC Sources except the reserve offsite feed are restored to OPERABLE status, continuation of the one time use of the special exception would be allowed.

APPLICABILITY

This LCO is applicable in MODES 1, 2, 3, and 4 only during installation of modification M22-1(2)-93-001B, from the time that the reserve offsite feed is made inoperable.

ACTIONS

A.1

With the main offsite feed, one or more unit-specific DGs, or the common DG inoperable, the required provisions of this special exception are not met. Therefore, Required Action A.1 requires that the applicable Conditions of LCO 3.8.1 be entered. This action is modified by a Note that requires the ACTIONS of LCO 3.8.1 be applied to the reserve offsite feed as well as the inoperable main offsite feed, unit-specific DG(s), or the common DG.

(continued)

BASES

ACTIONS (continued)

B.1 and B.2

With the unit specific reserve offsite feed inoperable for > 14 days, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.8.11.1

Performance of the identified SRs to verify the redundant, onsite AC sources of power are available within 24 hours prior to initiating the modification verifies that the reserve offsite feed is not removed from service with existing degradation in the AC sources.

SR 3.8.11.2

Performance of the identified SR to verify the redundant, offsite AC source of power is available within 1 hour prior to initiating the modification verifies that the reserve offsite feed is not removed from service with existing degradation in the AC sources.

REFERENCES

None.

DOD CHANGES

CHANGE NUMBER — DISCUSSION

35. NUREG SR 3.8.6.2 Frequency - The additional Frequencies associated with a battery discharge or overcharge are not included since they are not contained within Zion Stations current Technical Specifications and have been adequately covered by administrative controls. These conditions are currently treated as is any other condition which potentially impacts the operability of a required component, i.e., upon determination that an event has occurred or a condition has developed that may have rendered a component inoperable, the capability of the required equipment to perform its safety function is promptly evaluated and an operability determination is completed. A battery discharge or overcharge is currently evaluated under these administrative controls and is proposed to continue to be evaluated in this manner.

36. NUREG LCO 3.8.7 Actions Note & RA A.2 - The Completion Time for restoration is revised to retain the current TS allowed outage time of 14 days. This Completion Time has been previously determined to provide an adequate level of safety and no overwhelming basis has been identified to significantly shorten the allowed time. The Bases discussion of the Completion Time applies equally well to this time. However, additional clarification and conservative direction is provided by the proposed Actions Note, which will direct that the Actions of an inoperable distribution system be applied if the AC instrument bus is deenergized.

37. NUREG LCO 3.8.7 Cond. B - An additional entry conditional of "two or more AC instrument bus inverters inoperable" has been retained from the current TS. This added Condition prevents entry in LCO 3.0.3 and as such effectively reduces the allowed time for the required actions by 1 hour. Therefore, this preference of presentation is considered to be conservative.

38. NUREG LCO 3.8.9, Cond. C - NRC-20, C.1 not used since more than one DC division inoperable always results in a loss of function and entry into Condition E.

39. Not used.

40. NUREG SR 3.8.4.8 - An option to perform a "modified performance discharge test" is added. This is consistent with allowances provided in IEEE-450 and proposed generic changes to the NUREG.

CLEAN DOD

CHANGE NUMBER	DISCUSSION
35.	NUREG SR 3.8.6.2 Frequency - The additional Frequencies associated with a battery discharge or overcharge are not included since they are not contained within Zion Stations current Technical Specifications and have been adequately covered by administrative controls. These conditions are currently treated as is any other condition which potentially impacts the operability of a required component, i.e., upon determination that an event has occurred or a condition has developed that may have rendered a component inoperable, the capability of the required equipment to perform its safety function is promptly evaluated and an operability determination is completed. A battery discharge or overcharge is currently evaluated under these administrative controls and is proposed to continue to be evaluated in this manner.
36.	NUREG LCO 3.8.7 Actions Note & RA A.2 - The Completion Time for restoration is revised to retain the current TS allowed outage time of 14 days. This Completion Time has been previously determined to provide an adequate level of safety and no overwhelming basis has been identified to significantly shorten the allowed time. The Bases discussion of the Completion Time applies equally well to this time. However, additional clarification and conservative direction is provided by the proposed Actions Note, which will direct that the Actions of an inoperable distribution system be applied if the AC instrument bus is deenergized.
37.	NUREG LCO 3.8.7 Cond. B - An additional entry conditional of "two or more AC instrument bus inverters inoperable" has been retained from the current TS. This added Condition prevents entry in LCO 3.0.3 and as such effectively reduces the allowed time for the required actions by 1 hour. Therefore, this preference of presentation is considered to be conservative.
38.	NUREG LCO 3.8.9, Cond. C - NRC-20, C.1 not used since more than one DC division inoperable always results in a loss of function and entry into Condition E.
39.	Not used. ~~New LCO 3.8.11 - This LCO included to incorporate an approved one time exception to the Completion Times of proposed LCO 3.8.1, Required Actions A.3, C.1 and D.1. This Special Exception LCO allows extended Completion Times in accordance with recently approved License Amendment Nos. 163 and 151 for Units 1 and 2, respectively, so that a modification can be incorporated to upgrade the overcurrent relays for fault protection. (This LCO is requested to be approved for limited use only (one time per unit) such that it can be administratively removed from the TS once its usefulness has expired. This removal is requested to be in the form of a pre-approved Amendment such that only notification to NRC that the removal is being implemented is required.)~~

MARK UP OF ITS CHANGE

OI 3.1-02; Change wording of BASES discussion of SR 3.1.9.2

The wording for BASES discussion of SR 3.1.9.2, Control Rod Position Verification, has been changed to more clearly explain the purpose of the SR.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.1.9.1

Verification that the THERMAL POWER is ≤ 5% RTP will ensure that the plant is not operating in a condition that could invalidate the safety analyses. Verification of the THERMAL POWER at a Frequency of 1 hour during the performance of the PHYSICS TESTS will ensure that the initial conditions of the safety analyses are not violated.

SR 3.1.9.2

Verification of the position of each partially or fully withdrawn control rod is necessary to ensure that the minimum **required** negative reactivity requirements, ~~for insertion~~ **to ensure shutdown capability**, on a trip are preserved. A test Frequency of 2 hours is reasonable, based on normal control rod motion during control rod worth measurements.

SR 3.1.9.2 has been modified by a Note establishing that the position of only those control rods not fully inserted must be determined. It is assumed that the position and worth of fully inserted control rods is known.

SR 3.1.9.3

One of the assumptions made in granting an STE for SDM, is that all control rods not fully inserted will fully insert when tripped. This Surveillance is performed to verify that fact.

The Frequency of once within 7 days prior to reducing the plant SDM below the normal requirements is acceptable, based on the assumption that the control rods will remain OPERABLE and trippable for 7 days and during the performance of the test.

SR 3.1.9.3 has been modified by a Note establishing that this Surveillance is only required for control rods not fully inserted. During the performance of control rod worth measurements, certain control rods remain fully inserted. Since these control rods are not relied on to trip, there is no need to demonstrate that they will fully insert when tripped.

(continued)

CLEAN ITS SPEC

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.1.9.1

Verification that the THERMAL POWER is ≤ 5% RTP will ensure that the plant is not operating in a condition that could invalidate the safety analyses. Verification of the THERMAL POWER at a Frequency of 1 hour during the performance of the PHYSICS TESTS will ensure that the initial conditions of the safety analyses are not violated.

SR 3.1.9.2

Verification of the position of each partially or fully withdrawn control rod is necessary to ensure that the minimum required negative reactivity requirements, to ensure shutdown capability, on a trip are preserved. A test Frequency of 2 hours is reasonable, based on normal control rod motion during control rod worth measurements.

SR 3.1.9.2 has been modified by a Note establishing that the position of only those control rods not fully inserted must be determined. It is assumed that the position and worth of fully inserted control rods is known.

SR 3.1.9.3

One of the assumptions made in granting an STE for SDM, is that all control rods not fully inserted will fully insert when tripped. This Surveillance is performed to verify that fact.

The Frequency of once within 7 days prior to reducing the plant SDM below the normal requirements is acceptable, based on the assumption that the control rods will remain OPERABLE and trippable for 7 days and during the performance of the test.

SR 3.1.9.3 has been modified by a Note establishing that this Surveillance is only required for control rods not fully inserted. During the performance of control rod worth measurements, certain control rods remain fully inserted. Since these control rods are not relied on to trip, there is no need to demonstrate that they will fully insert when tripped.

(continued)

NUREG MARKUPS

BASES (continued)

SURVEILLANCE REQUIREMENTS

9.2
SR 3.1.~~11.1~~ INSERT B71 A

INSERT 71B
~~In order to establish an acceptable SDM during the measurement of control rod worths, it is necessary to know the position of each control rod.~~ A test Frequency of 2 hours is reasonable, based on normal control rod motion during control rod worth measurements.

9.2
SR 3.1.~~11.1~~ has been modified by a Note establishing that the position of only those control rods not fully inserted must be determined. It is assumed that the position and worth of fully inserted control rods is known.

9.3
SR 3.1.~~11.2~~

One of the assumptions made in granting an STE for SDM, is that all control rods not fully inserted will fully insert when tripped. This Surveillance is performed to verify that fact.

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once within 7 days
The Frequency of ~~24 hours~~ prior to reducing the plant SDM below the normal requirements is acceptable, based on the assumption that the control rods will remain OPERABLE and trippable for ~~24 hours~~ 7 days and during the performance of the test.

9.3
SR 3.1.~~11.2~~ has been modified by a Note establishing that this Surveillance is only required for control rods not fully inserted. During the performance of control rod worth measurements, certain control rods remain fully inserted. Since these rods are not relied on to trip, there is no need to demonstrate that they will fully insert when tripped.

REFERENCES

1. 10 CFR 50, Appendix B, Section XI.
2. 10 CFR 50.59.
3. Regulatory Guide 1.68, Revision 2, August 1978.
4. ANSI/ANS-19.6.1-1985, December 13, 1985.
5. ~~FSAR, Chapter [14].~~ 10 CFR 50.46.
6. UFSAR, Section 15.3.

INSERT B71B (from CEOG STS, NUREG-1432, Section B.3.1.9, SR 3.1.9.2)

Verification of the position of each partially or fully withdrawn control rod is necessary to ensure that the minimum required negative reactivity requirements to ensure shutdown capability on a trip are preserved.

MARK UP OF ITS CHANGE

OI 3.5-10; BASES Table B 3.5.2-1, Clarification of ability to reenergize and test SI Motor Operated Valves.

Table B 3.5.2-1 in the BASES for 3.5.2, ECCS-Operating, provides for the ability to energize and test MOV-SI9010A, SI9010B, SI9011A, and SI9011B, with certain conditions. The wording in the Table has been clarified to discuss why this allowance is required and what actions are required to test these valves.

Table B 3.5.2-1 (Page 1 of 1)

ECCS Valves Which Could Render Both Trains Inoperable or Invalidate Assumptions Used in the LOCA Analysis

Valve No.	Required Position For OPERABILITY
MOV-RH8703	Open
MOV-RH9000	Closed
MOV-SI8800A	Open
MOV-SI8800B	Open
MOV-SI8800C	Open
MOV-SI8800D	Open
MOV-SI8802	Open
MOV-SI8806	Open
MOV-SI8809A	Open
MOV-SI8809B	Open
MOV-SI8812A	Open
MOV-SI8812B	Open
MOV-SI9011A	Closed
MOV-SI9011B	Closed

~~MOV-SI9011A or B may be energized and operated for testing and required plant evolutions if the associated pump discharge valve MOV-SI9010A or B has been previously closed and deenergized to prevent a single failure from simultaneously making both trains of SI inoperable.~~

For testing and required plant evolutions requiring manipulation of the MOV-SI9011A or B valves, the MOV-SI9010A or B valves are closed and de-energized to fulfill the requirements of SR 3.5.2.1 and SR 3.5.2.2. This will prevent a single failure from simultaneously rendering both trains of SI inoperable. However, during this evolution, the affected train of SI must be declared inoperable and Required Action A.1 entered.

CLEAN ITS SPEC

Table B 3.5.2-1 (Page 1 of 1)

ECCS Valves Which Could Render Both Trains Inoperable or Invalidate Assumptions Used in the LOCA Analysis

Valve No.	Required Position For OPERABILITY
MOV-RH8703	Open
MOV-RH9000	Closed
MOV-SI8800A	Open
MOV-SI8800B	Open
MOV-SI8800C	Open
MOV-SI8800D	Open
MOV-SI8802	Open
MOV-SI8806	Open
MOV-SI8809A	Open
MOV-SI8809B	Open
MOV-SI8812A	Open
MOV-SI8812B	Open
MOV-SI9011A	Closed
MOV-SI9011B	Closed

For testing and required plant evolutions requiring manipulation of the MOV-SI9011A or B valves, the MOV-SI9010A or B valves are closed and de-energized to fulfill the requirements of SR 3.5.2.1 and SR 3.5.2.2. This will prevent a single failure from simultaneously rendering both trains of SI inoperable. However, during this evolution, the affected train of SI must be declared inoperable and Required Action A.1 entered.

NUREG MARKUPS

9

3.5.2 BASES (con't)

INSERT "L"

Table B 3.5.2-1 (Page 1 of 1)

ECCS Valves Which Could Render Both Trains Inoperable or Invalidate Assumptions Used in the LOCA Analysis

Valve No.	Required Position For OPERABILITY
MOV-RH8703	Open
MOV-RH-9000	Closed
MOV-SI8800A	Open
MOV-SI8800B	Open
MOV-SI8800C	Open
MOV-SI8800D	Open
MOV-SI8802	Open
MOV-SI8806	Open
MOV-SI8809A	Open
MOV-SI8809B	Open
MOV-SI8812A	Open
MOV-SI8812B	Open
MOV-SI9011A	Closed
MOV SI9011B	Closed

For testing and required plant evolutions requiring manipulation of the MOV-SI9011A or B valves, the MOV-SI9010A or B valves are closed and de-energized to fulfill the requirements of SR 3.5.2.1 and SR 3.5.2.2. This will prevent a single failure from simultaneously rendering both trains of SI inoperable. However, during this evolution, the affected train of SI must be declared inoperable and Required Action A.1 entered.

MARK UP OF DOC CHANGE

OI 3.6-03; Clarification of DOC 3.6-93, Valves that are locked, sealed, or otherwise secured in the required position.

Additional discussion has been added to DOC 3.6-93 to clarify why it is acceptable for valves that are locked, sealed, or otherwise secured in the required position do not need automatic isolation capability.

NSHC	NO.	DISCUSSION
L-26.	91.	In CTS 4.10.6, the Surveillance Frequency for the verification of containment temperature has been revised to once per "24 hours" instead of "once per shift." The 24 hour Frequency is considered acceptable based on the observed slow rates of temperature increase within containment as a result of environmental heat sources (due to the large volume of containment). In addition, other indications are available in the control room to alert the operator to an abnormal containment temperature condition.
	92.	Deleted
L-28	93.	This change to the requirements of the CTS 4.9.3.A.2 exempts certain automatic containment isolation valves from the 18 month surveillance testing that would demonstrate satisfactory operation. The valves are exempted because they are locked, sealed, or otherwise secured in the required position under administrative controls. These valves do not reposition in order to fulfill their safety function, and are secured in their required position to fulfill their accident function. Therefore no automatic isolation is required. This exemption is in accordance with NUREG 1431, Rev 1.
L-29	94.	This change to the requirements of CTS 4.5.1.b.2 eliminates the 18 month surveillance for those required (Accident Inlet, Accident Outlet, and Normal Inlet) dampers that have been secured in the accident position. It would be superfluous to verify the position of such dampers, and any alteration which would allow the dampers to be repositioned would constitute a change to the facility design.

CLEAN DOC

NSHC	NO.	DISCUSSION
L-26.	91.	In CTS 4.10.6, the Surveillance Frequency for the verification of containment temperature has been revised to once per "24 hours" instead of "once per shift." The 24 hour Frequency is considered acceptable based on the observed slow rates of temperature increase within containment as a result of environmental heat sources (due to the large volume of containment). In addition, other indications are available in the control room to alert the operator to an abnormal containment temperature condition.
	92.	Deleted
L-28	93.	This change to the requirements of the CTS 4.9.3.A.2 exempts certain automatic containment isolation valves from the 18 month surveillance testing that would demonstrate satisfactory operation. The valves are exempted because they are locked, sealed, or otherwise secured in the required position under administrative controls. These valves do not reposition in order to fulfill their safety function, and are secured in their required position to fulfill their accident function. Therefore no automatic isolation is required. This exemption is in accordance with NUREG 1431, Rev 1.
L-29	94.	This change to the requirements of CTS 4.5.1.b.2 eliminates the 18 month surveillance for those required (Accident Inlet, Accident Outlet, and Normal Inlet) dampers that have been secured in the accident position. It would be superfluous to verify the position of such dampers, and any alteration which would allow the dampers to be repositioned would constitute a change to the facility design.

MARK UP OF ITS CHANGE

OI 3.8-02; Changes to requirements and discussion for shutdown power sources.
Changes affect LCO 3.8.2, 3.8.8, and 3.8.10

Due to shared DG equipment that may be powered by the opposite unit DGs, the LCOs for AC Power Sources-Shutdown, Inverters-Shutdown, and Distribution Systems-Shutdown have been revised.

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources – Shutdown

LCO 3.8.2 The following AC electrical power sources required to support the onsite Class 1E AC electrical power distribution division(s) required by LCO 3.8.10, "Distribution Systems – Shutdown" shall be OPERABLE:

a. One qualified feed from the offsite transmission network;

b. One unit-specific diesel generator (DG), when in MODES 5 or 6;

c. One DG capable of supplying the onsite 1E electrical power distribution division required in support of the Control Room Emergency Filtration System (LCO 3.7.9) and the Control Room Ventilation System (LCO 3.7.10) during movement of irradiated fuel in the containment or fuel handling buildings, and during CORE ALTERATIONS; and

d. One DG capable of supplying the onsite 1E electrical power distribution division required in support of the Fuel Handling Building Exhaust Filter System (LCO 3.7.13).

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies in the containment or fuel handling buildings,
During CORE ALTERATIONS,
During conditions when the Fuel Handling Building Exhaust Filter System is required to be OPERABLE or in operation per LCO 3.7.13.

~~LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:~~

~~a. One qualified feed between the offsite transmission network and the onsite Class 1E AC electrical power distribution division(s) required by LCO 3.8.10, "Distribution Systems – Shutdown"; and~~

~~b. One diesel generator (DG) capable of supplying one division of the onsite Class 1E AC electrical power distribution division(s) required by LCO 3.8.10.~~

~~APPLICABILITY: MODES 5 and 6,~~
~~During movement of irradiated fuel assemblies in the containment or fuel handling buildings.~~

ACTIONS

-----------------------------------NOTE-----------------------------------
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite feed inoperable.	------------NOTE------------ Enter applicable Conditions and Required Actions of LCO 3.8.10, with one required division de-energized as a result of Condition A. ----------------------------	
	A.1 Declare required feature(s) with no offsite power available inoperable.	Immediately
	<u>OR</u>	
		(continued)

S

CONDITION	REQUIRED ACTION		COMPLETION TIME
continued)	A.2.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	A.2.2	Suspend movement of irradiated fuel assemblies in the containment and fuel handling buildings.	Immediately
	AND		
	A.2.3	Initiate action to suspend operations involving positive reactivity additions.	Immediately
	AND		
	A.2.4	Initiate action to restore required offsite power feed to OPERABLE status.	Immediately
One required DG inoperable.	B.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	B.2	Suspend movement of irradiated fuel assemblies in the containment and fuel handling buildings.	Immediately
	AND		(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
(continued)			
B. One required DG inoperable.	B.3	Initiate action to suspend operations involving positive reactivity additions.	Immediately
	AND		
	B.4	Initiate action to restore required DG to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.2.1	-------------------NOTE------------------- The following SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.8, SR 3.8.1.9, SR 3.8.1.11, SR 3.8.1.12, and SR 3.8.1.13. --- For AC sources required to be OPERABLE, the following SRs are applicable: SR 3.8.1.1 SR 3.8.1.5 SR 3.8.1.11 SR 3.8.1.2 SR 3.8.1.6 SR 3.8.1.12 SR 3.8.1.3 SR 3.8.1.8 SR 3.8.1.13 SR 3.8.1.4 SR 3.8.1.9	In accordance with applicable SRs

RICAL POWER SYSTEMS

Sources – Shutdown

A description of the AC sources is provided in the Bases for LCO 3.8.1, "AC Sources – Operating."

ALYSES

The OPERABILITY of the minimum AC sources during MODES 5 and 6, ~~and~~ during movement of irradiated fuel assemblies in the containment or fuel handling buildings, **during CORE ALTERATIONS, and when required to support the Fuel Handling Building Exhaust Filter System** ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate AC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. ~~However, a single failure is not required to be assumed concurrent with the loss of all offsite or all onsite power. The rationale for this is based on the fact that many~~ In a shutdown condition, Design Basis Accidents (DBAs) that are analyzed in MODES 1, 2, 3, and 4 have no specific analyses in MODES 5 and 6. Worst case bounding events are ~~deemed~~ not credible in MODES 5 and 6 because the system conditions (i.e., the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses) result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

(continued)

BASES

For a unit in MODES 5, 6, during movement of irradiated fuel assemblies in the containment or fuel handling buildings, during CORE ALTERATIONS, or when required to support the required Fuel Handling Building Exhaust Filter System, the licensing basis for the shutdown AC Sources is a DBA for the unit that is shutdown that does not require Safety Injection to be initiated (e.g., fuel handling accident) combined with a dual-unit Loss Of Offsite Power (LOOP). For the unit that is still at power the licensing basis for the AC Sources is a DBA that requires Safety Injection to be initiated to mitigate the accident coincident with a unit-specific LOOP. In addition, a dual-unit LOOP is also considered a design-basis accident for shutdown conditions.

The OPERABILITY of the necessary shutdown AC sources is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

These ~~limiting design basis accidents~~limitations for shutdown conditions are based on maintaining availability of at least one train of Control Room Emergency Filtration System (CREFS), Control Room Ventilation System (CRVS), and Fuel Handling Building Exhaust Filter System. Because these are shared between both units, with the potential to be powered from any ~~unit specific~~ DG~~s~~, the required DGs are not identified as a unit-specific DG, but are identified by the system trains that are required.

~~During MODES 1, 2, 3, and 4, various deviations from the analysis assumptions and design requirements are allowed within the Required Actions. This allowance is in recognition that certain testing and maintenance activities must be conducted provided an acceptable level of risk is not exceeded. During MODES 5 and 6, performance of a significant number of required testing and maintenance activities is also required. In MODES 5 and 6, the activities are generally planned and administratively controlled. Relaxations from MODE 1, 2, 3, and 4 LCO requirements are acceptable during shutdown modes based on:~~

~~a. The fact that time in an outage is limited. This is a risk prudent goal as well as a utility economic consideration.~~

(continued)

BASES

~~b. Requiring appropriate compensatory measures for certain conditions. These may include administrative controls, reliance on systems that do not necessarily meet typical design requirements applied to systems credited in operating MODE analyses, or both.~~

~~c. Prudent utility consideration of the risk associated with multiple activities that could affect multiple systems.~~

~~d. Maintaining, to the extent practical, the ability to perform required functions (even if not meeting MODE 1, 2, 3, and 4 OPERABILITY requirements) with systems assumed to function during an event.~~

During movement of irradiated fuel in the containment or fuel handling building, during CORE ALTERATIONS, or when required by the Fuel Handling Building Exhaust Filter System, this LCO ensures that in ~~In~~ the event of an accident ~~during shutdown, this LCO ensures~~ the capability to support systems necessary to avoid immediate difficulty is available.

The AC sources satisfy Criterion 3 of the NRC Policy Statement.

LCO

One offsite feed capable of supplying the onsite Class 1E electrical power distribution division(s)required by ~~of~~ LCO 3.8.10, "Distribution Systems - Shutdown," ensures that all required loads are powered from offsite power.

Together, OPERABILITY of the required offsite feed and DG ensures the availability of sufficient AC sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

The qualified offsite feed must be capable of maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the Engineered Safety Feature (ESF) bus(es). Either the main or reserve offsite feed is capable of providing the required ESF bus loads. One offsite AC power feed and associated protective relaying is required to meet LCO 3.8.2.a.

(continued)

BASES

For Unit 1, the main qualified offsite feed consists of a line from the 345 kV switchyard bus 7 to system auxiliary transformer (SAT) 142, breakers 1422, 1432, 1442, 1424, 1471, 1434, 1481, 1444, 1491 and buses 142, 143, and 144. The reserve qualified offsite feed consists of a line from the 345 kV switchyard bus 3 to SAT 242, breakers 2412, 1472, 1482, 1492 and bus 241.

For Unit 2, the main qualified offsite feed consists of a line from the 345 kV switchyard bus 3 to SAT 242, breakers 2422, 2432, 2442, 2424, 2471, 2434, 2481, 2444, 2491 and buses 242, 243 and 244. The reserve qualified offsite feed consists of a line from the 345 kV switchyard bus 7 to SAT 142, breakers 1412, 2472, 2482, 2492 and bus 141.

The ESF buses may also be powered by backfeeding through the main power transformer (MPT). This method is credited as a qualified offsite power supply, if the unit is in MODE 5 or 6, or defueled, since the protective relaying and trip circuits provide protection equivalent to the main and reserve offsite feeds. As such, it may be used to satisfy the requirements of LCO 3.8.2.a. For Unit 1 this feed consists of a line from the 345 kV switchyard to MPT E and 1W, breakers 1421, 1431, 1441, 1424, 1434, 1444, 1471, 1481, 1491, buses 142, 143, 144, and the associated protective relaying. For Unit 2, this feed consists of a line from the 345 kV switchyard to MPT 2E and 2W, breakers 2421, 2431, 2441, 2424, 2434, 2444, 2471, 2481, 2491, buses 242, 243, 244, and the associated protective relaying.

OPERABLE DGs, associated with a distribution system division required to be OPERABLE by LCO 3.8.10, ensures a diverse power source is available to provide electrical power support, assuming a loss of the offsite feed.

To ensure a diverse power source is available to support RHR equipment required to be OPERABLE, ~~the~~ **a unit-specific** DG must be capable of supplying ~~an~~**the** appropriate onsite 1E **electrical power distribution** division ~~for the specific shutdown conditions~~ **when in MODE 5 or 6.**

During **movement of irradiated** fuel in the containment or fuel **handling buildings** and during CORE ALTERATIONS, a DG capable **of supplying the onsite** 1E electrical power **distribution division** required in support of the CREFS (LCO

(continued)

3.7.9) and CRVS (LCO 3.7.10) is required. This DG may be associated with the opposite unit.

When required to support the Fuel Handling Building Exhaust Filter System, a DG capable of supplying the onsite 1E electrical power distribution division required in support of the required Fuel Handling Building Exhaust Filter System (LCO 3.7.13) is required. This DG may be associated with the opposite unit.

For example, during conditions when a Fuel Handling Building Exhaust Filter System train is required to be OPERABLE or in operation (e.g., during movement of CORE ALTERATIONS with the equipment hatch not intact), the power supply for the associated division may be supplied from a DG associated with the other unit.

The required DGs must ~~also~~ be capable of starting, accelerating to rated speed and voltage, and connecting to its respective ESF bus on detection of bus undervoltage. This sequence must be accomplished in ≤ 12 seconds. The DG must be capable of accepting required loads ~~within the assumed manual loading sequence intervals~~, and continue to operate until offsite power can be restored to the ESF buses. ~~These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot and DG in standby at ambient conditions.~~

It is acceptable for divisions to be cross tied during shutdown conditions, allowing a single offsite power feed to supply all required divisions.

Diesel fuel oil and starting air support systems are addressed in LCO 3.8.3, "Diesel Fuel Oil and Starting Air."

Automatic DG start on loss of power is addressed in LCO 3.3.5, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation."

Each engine lubrication oil sump contains an inventory capable of supporting a minimum of 7 days of operation. This supply is sufficient to allow the operator to replenish lube oil from outside sources. OPERABILITY also requires the quantity of lube oil be maintained with the sightglass to assure an adequate 7 day supply.

(continued)

BASES

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6, ~~and~~ during movement of irradiated fuel assemblies in the containment or fuel handling buildings, during CORE ALTERATIONS, and when required to support the Fuel Handling Building Exhaust Filter System, provides assurance that:

a. Systems needed to mitigate a fuel handling accident are available;

b. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

APPLICABILITY (continued)

c. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.1.

ACTIONS

LCO 3.0.3 is not applicable in MODE 5 or 6. However, since movement of irradiated fuel assemblies can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel during MODE 5 or 6, LCO 3.0.3 would not specify any required action. If moving irradiated fuel in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Therefore, in either case, inability to complete the Required Actions within the specified Completion Times would not be sufficient reason to require a reactor shutdown.

A.1

An offsite feed would be considered inoperable if it were not available to any required ESF bus. Although two or more divisions may be required by LCO 3.8.10, one bus with offsite power available may be capable of supporting sufficient required features (subsystems or individual components) to allow continuation of CORE ALTERATIONS and

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fuel movement. By the allowance of the option to declare required features inoperable, with no offsite power available, appropriate restrictions will be implemented in accordance with the affected required features LCO ACTIONS.

A.2.1, A.2.2, A.2.3, A.2.4, B.1, B.2, B.3, and B.4

With the offsite feed not available to all required divisions, the option exists to declare all required features inoperable (as discussed in Required Action A.1). Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made (Required Actions A.2.1, A.2.2, and A.2.3). With the required DG inoperable (Condition B), the minimum required diversity of AC power sources is not available.

ONS

A.2.1, A.2.2, A.2.3, A.2.4, B.1, B.2, B.3, and B.4 (continued)

It is, therefore, required to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions (Required Actions B.1, B.2, and B.3). The Required Action to suspend positive reactivity additions (Required Actions A.2.3 and B.3) does not preclude actions to maintain or increase reactor vessel inventory provided the required SDM is maintained.

Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability or the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC sources and to continue this action until restoration is accomplished in order to provide the necessary AC power to the unit safety systems (Required Actions A.2.4 and B.4).

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required AC electrical power sources should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

The Required Actions of Condition A are modified by a Note to indicate that when Condition A is entered with no AC

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power to any required ESF bus, the ACTIONS for LCO 3.8.10 must be immediately entered. This Note allows Condition A to provide requirements for the loss of the offsite feed, whether or not a train is de-energized. LCO 3.8.10 would provide the appropriate restrictions for the situation involving a de-energized division. This exception to LCO 3.0.6 ensures proper actions are taken for these components.

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SR 3.8.2.1

SR 3.8.2.1 requires the SRs from LCO 3.8.1 that are necessary for ensuring the OPERABILITY of the AC sources in other than MODES 1, 2, 3, and 4. SR 3.8.1.7 is not required to be met since only one offsite feed is required to be OPERABLE. SR 3.8.1.14 is not required to be met because the

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SR 3.8.2.1 (continued)

required OPERABLE DG is not required to undergo periods of being synchronized to the offsite feed. SR 3.8.1.17 is excepted because starting independence is not required with the DGs that are not required to be OPERABLE.

This Surveillance is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DG(s) from being paralleled with the offsite power network or otherwise rendered inoperable during performance of SRs, and to preclude deenergizing a required 4160 V ESF bus or disconnecting a required offsite feed during performance of SRs. With limited AC sources available, a single event could compromise both the required feed and the DG. It is the intent that these SRs must still be capable of being met, but actual performance is not required during periods when the DG and offsite feed are required to be OPERABLE. Refer to the corresponding Bases for LCO 3.8.1 for a discussion of each SR.

NCES None.

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Inverters – Shutdown

LCO 3.8.8 AC instrument bus inverters shall be OPERABLE to support the onsite Class 1E AC instrument bus electrical power distribution division(s) required by LCO 3.8.10, "Distribution Systems – Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies in the containment or fuel handling buildings,
During CORE ALTERATIONS,
During conditions when the Fuel Handling Building Exhaust Filter System is required OPERABLE or in operation per LCO 3.7.13.

ACTIONS

NOTES

1. LCO 3.0.3 is not applicable.

2. Enter the applicable Conditions and Required Actions of LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP)," for the associated LTOP features made inoperable by the AC instrument bus inverter.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC instrument bus inverters inoperable.	A.1 Declare required feature(s) inoperable. <u>OR</u>	Immediately

POWER SYSTEMS

– Shutdown

A description of the inverters is provided in the Bases for LCO 3.8.7, "Inverters – Operating."

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 15 (Ref. 1) assume various safety systems are OPERABLE. The inverters are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to the Reactor Protection System and other safety system instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the inverters is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum inverters to each required AC instrument bus during MODES 5 and 6, during movement of irradiated fuel assemblies in the containment or fuel handling buildings, ~~and~~ during CORE ALTERATIONS, and during conditions when the Fuel Handling Building Exhaust Filter System is required OPERABLE or in operation per LCO 3.7.13 ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate power is available to mitigate events postulated during shutdown, such as a low temperature overpressurization event or a fuel handling accident.

The inverters were previously identified as part of the assumed power sources for the distribution system and, as such, satisfy Criterion 3 of the NRC Policy Statement.

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The inverters ensure the availability of electrical power for the instrumentation for systems required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated DBA. The unit-specific inverters provide uninterruptable supply of AC electrical power to the AC instrument buses even if the respective 4.16 kV bus is de-energized. This ensures the availability of sufficient inverter power sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

An OPERABLE inverter must be supplied power from its associated Class 1E battery, and supplying the associated AC instrument bus with acceptable output AC voltage. Alternately, the power supply to the inverter may be from the internally rectified AC source, provided the Class 1E battery feed is OPERABLE as the backup uninterruptable power supply.

LITY The inverters required to be OPERABLE in MODES 5 and 6, ~~and~~ during movement of irradiated fuel assemblies, **during CORE ALTERATIONS, and during conditions when the Fuel Handling Building Exhaust Filter System is required OPERABLE or in operation per LCO 3.7.13** provides assurance that:

a. Systems to mitigate a low temperature overpressurization event are available;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

Inverter requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.7.

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems – Shutdown

LCO 3.8.10 The necessary portions of AC, ESF, DC, and AC instrument bus electrical power distribution divisions shall be OPERABLE to support unit-specific and common equipment required to be OPERABLE.

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies in the containment or fuel handling buildings
During CORE ALTERATIONS
During conditions when the Fuel Handling Building Exhaust Filter System is required OPERABLE or in operation per LCO 3.7.13.

ACTIONS

-----NOTES-----

1. LCO 3.0.3 is not applicable.
2. Enter the applicable Conditions and Required Actions of LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP)," for the associated LTOP features made inoperable by the Electrical Power Distribution System.
3. Enter the applicable Conditions and Required Actions of LCO 3.4.7, "RCS Loops – MODE 5," for RHR shutdown cooling made inoperable by the Electrical Power Distribution System.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more required AC ESF, DC, or AC instrument bus divisions inoperable.	A.1	Declare supported required feature(s) inoperable.	Immediately
	<u>OR</u>		
			(continued)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.10 Distribution Systems – Shutdown

BASES

BACKGROUND

A description of the AC Engineered Safety Feature (ESF), DC, and AC instrument bus electrical power distribution systems is provided in the Bases for LCO 3.8.9, "Distribution Systems – Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident and transient analyses in the UFSAR, Chapter 15 (Ref. 1), assume various safety systems are OPERABLE. The AC ESF, DC, and AC instrument bus electrical power distribution divisions are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to safety systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the necessary AC ESF, DC, and AC instrument bus electrical power distribution division(s) is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum AC ESF, DC, and AC instrument bus electrical power distribution divisions during MODES 5 and 6, ~~and~~ during movement of irradiated fuel assemblies in the containment or fuel handling buildings, **during CORE ALTERATIONS, and during conditions when the Fuel Handling Building Exhaust Filter System is required OPERABLE or in operation** ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate power is provided to mitigate events postulated during shutdown, such as a low temperature overpressurization event or a fuel handling accident.

(continued)

BASES

The AC and DC electrical power distribution divisions satisfy Criterion 3 of the NRC Policy Statement.

LCO

Various combinations of subsystems, equipment, and components are required OPERABLE by other LCOs, depending on the specific plant condition. Implicit in those requirements is the required OPERABILITY of necessary support required features. This LCO explicitly requires energization of the portions of the electrical distribution system necessary to support OPERABILITY of required systems, equipment, and components - all specifically addressed in each LCO and implicitly required via the definition of OPERABILITY.

Maintaining these portions of the distribution system energized ensures the availability of sufficient power to operate the unit in a safe manner to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents and low temperature overpressurization events).

APPLICABILITY

The AC and DC electrical power distribution divisions required to be OPERABLE in MODES 5 and 6, ~~and~~ during movement of irradiated fuel assemblies in the containment or fuel handling buildings, **during CORE ALTERATIONS, and during conditions when the Fuel Handling Building Exhaust Filter System is required OPERABLE or in operation** provides assurance that:

a. Systems to mitigate a low temperature overpressurization event are available;

b. Systems to mitigate a fuel handling accident are available;

c. Systems to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition and refueling condition.

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3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources - Shutdown

LCO 3.8.2 The following AC electrical power sources required to support the onsite Class 1E AC electrical power distribution division(s) required by LCO 3.8.10, "Distribution Systems - Shutdown" shall be OPERABLE:

a. One qualified feed from the offsite transmission network;

b. One unit-specific diesel generator (DG), when in MODES 5 or 6;

c. One DG capable of supplying the onsite 1E electrical power distribution division required in support of the Control Room Emergency Filtration System (LCO 3.7.9) and the Control Room Ventilation System (LCO 3.7.10) during movement of irradiated fuel in the containment or fuel handling buildings, and during CORE ALTERATIONS; and

d. One DG capable of supplying the onsite 1E electrical power distribution division required in support of the Fuel Handling Building Exhaust Filter System (LCO 3.7.13).

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies in the containment or fuel handling buildings,
During CORE ALTERATIONS,
During conditions when the Fuel Handling Building Exhaust Filter System is required to be OPERABLE or in operation per LCO 3.7.13.

ACTIONS

---NOTE---
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite feed inoperable.	---NOTE--- Enter applicable Conditions and Required Actions of LCO 3.8.10, with one required division de-energized as a result of Condition A. ---	
	A.1 Declare required feature(s) with no offsite power available inoperable.	Immediately
	OR	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2.2 Suspend movement of irradiated fuel assemblies in the containment and fuel handling buildings.	Immediately
	AND	
		(continued)

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A.2 (continued)	A.2.3	Initiate action to suspend operations involving positive reactivity additions.	Immediately
	AND		
	A.2.4	Initiate action to restore required offsite power feed to OPERABLE status.	Immediately
B. One required DG inoperable.	B.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	B.2	Suspend movement of irradiated fuel assemblies in the containment and fuel handling buildings.	Immediately
	AND		
	B.3	Initiate action to suspend operations involving positive reactivity additions.	Immediately
	AND		
	B.4	Initiate action to restore required DG to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.2.1	-------------------NOTE------------------- The following SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.8, SR 3.8.1.9, SR 3.8.1.11, SR 3.8.1.12, and SR 3.8.1.13. -- For AC sources required to be OPERABLE, the following SRs are applicable: SR 3.8.1.1 SR 3.8.1.5 SR 3.8.1.11 SR 3.8.1.2 SR 3.8.1.6 SR 3.8.1.12 SR 3.8.1.3 SR 3.8.1.8 SR 3.8.1.13 SR 3.8.1.4 SR 3.8.1.9	In accordance with applicable SRs

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.2 AC Sources - Shutdown

BASES

BACKGROUND

A description of the AC sources is provided in the Bases for LCO 3.8.1, "AC Sources - Operating."

APPLICABLE SAFETY ANALYSES

The OPERABILITY of the minimum AC sources during MODES 5 and 6, during movement of irradiated fuel assemblies in the containment or fuel handling buildings, during CORE ALTERATIONS, and when required to support the Fuel Handling Building Exhaust Filter System ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate AC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. In a shutdown condition, Design Basis Accidents (DBAs) that are analyzed in MODES 1, 2, 3, and 4 have no specific analyses in MODES 5 and 6. Worst case bounding events are not credible in MODES 5 and 6 because the system conditions (i.e., the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses) result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

(continued)

BASES

APPLICABLE SAFETY ANALYSIS (continued)	For a unit in MODES 5, 6, during movement of irradiated fuel assemblies in the containment or fuel handling buildings, during CORE ALTERATIONS, or when required to support the required Fuel Handling Building Exhaust Filter System, the licensing basis for the shutdown AC Sources is a DBA for the unit that is shutdown that does not require Safety Injection to be initiated (e.g., fuel handling accident) combined with a dual-unit Loss of Off-site Power (LOOP). For the unit that is still at power the licensing basis for the AC Sources is a DBA that requires Safety Injection to be initiated to mitigate the accident coincident with a unit-specific LOOP. In addition, a dual-unit LOOP is also considered a design-basis accident for shutdown conditions.
	The OPERABILITY of the necessary shutdown AC sources is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.
	These limitations for shutdown conditions are based on maintaining availability of at least one train of Control Room Emergency Filtration System (CREFS), Control Room Ventilation System (CRVS), and Fuel Handling Building Exhaust Filter System. Because these are shared between both units, with the potential to be powered from any DG, the required DGs are not identified as a unit-specific DG, but are identified by the system trains that are required.
	During movement of irradiated fuel in the containment or fuel handling building, during CORE ALTERATIONS, or when required by the Fuel Handling Building Exhaust Filter System, this LCO ensures that in the event of an accident the capability to support systems necessary to avoid immediate difficulty is available.
	The AC sources satisfy Criterion 3 of the NRC Policy Statement.
LCO	One offsite feed capable of supplying the onsite Class 1E electrical power distribution division(s)required by LCO 3.8.10, "Distribution Systems – Shutdown," ensures that all required loads are powered from offsite power.

(continued)

BASES

LCO (continued)

Together, OPERABILITY of the required offsite feed and DG ensures the availability of sufficient AC sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

The qualified offsite feed must be capable of maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the Engineered Safety Feature (ESF) bus(es). Either the main or reserve offsite feed is capable of providing the required ESF bus loads. One offsite AC power feed and associated protective relaying is required to meet LCO 3.8.2.a.

For Unit 1, the main qualified offsite feed consists of a line from the 345 kV switchyard bus 7 to system auxiliary transformer (SAT) 142, breakers 1422, 1432, 1442, 1424, 1471, 1434, 1481, 1444, 1491 and buses 142, 143, and 144. The reserve qualified offsite feed consists of a line from the 345 kV switchyard bus 3 to SAT 242, breakers 2412, 1472, 1482, 1492 and bus 241.

For Unit 2, the main qualified offsite feed consists of a line from the 345 kV switchyard bus 3 to SAT 242, breakers 2422, 2432, 2442, 2424, 2471, 2434, 2481, 2444, 2491 and buses 242, 243 and 244. The reserve qualified offsite feed consists of a line from the 345 kV switchyard bus 7 to SAT 142, breakers 1412, 2472, 2482, 2492 and bus 141.

The ESF buses may also be powered by backfeeding through the main power transformer (MPT). This method is credited as a qualified offsite power supply, if the unit is in MODE 5 or 6, or defueled, since the protective relaying and trip circuits provide protection equivalent to the main and reserve offsite feeds. As such, it may be used to satisfy the requirements of LCO 3.8.2.a. For Unit 1 this feed consists of a line from the 345 kV switchyard to MPT E and 1W, breakers 1421, 1431, 1441, 1424, 1434, 1444, 1471, 1481, 1491, buses 142, 143, 144, and the associated protective relaying. For Unit 2, this feed consists of a line from the 345 kV switchyard to MPT 2E and 2W, breakers 2421, 2431, 2441, 2424, 2434, 2444, 2471, 2481, 2491, buses 242, 243, 244, and the associated protective relaying.

(continued)

BASES

LCO
(continued)

OPERABLE DGs, associated with a distribution system division required to be OPERABLE by LCO 3.8.10, ensures a diverse power source is available to provide electrical power support, assuming a loss of the offsite feed.

To ensure a diverse power source is available to support RHR equipment required to be OPERABLE, a unit-specific DG must be capable of supplying the appropriate onsite 1E electrical power distribution division when in MODE 5 or 6.

During movement of irradiated fuel in the containment or fuel handling buildings and during CORE ALTERATIONS, a DG capable of supplying the onsite 1E electrical power distribution division required in support of the CREFS (LCO 3.7.9) and CRVS (LCO 3.7.10) is required. This DG may be associated with the opposite unit.

When required to support the Fuel Handling Building Exhaust Filter System, a DG capable of supplying the onsite 1E electrical power distribution division required in support of the required Fuel Handling Building Exhaust Filter System (LCO 3.7.13) is required. This DG may be associated with the opposite unit.

For example, during conditions when a Fuel Handling Building Exhaust Filter System train is required to be OPERABLE or in operation (e.g., during movement of CORE ALTERATIONS with the equipment hatch not intact), the power supply for the associated division may be supplied from a DG associated with the other unit.

The required DGs must be capable of starting, accelerating to rated speed and voltage, and connecting to its respective ESF bus on detection of bus undervoltage. This sequence must be accomplished in ≤ 12 seconds. The DG must be capable of accepting required loads, and continue to operate until offsite power can be restored to the ESF buses.

It is acceptable for divisions to be cross tied during shutdown conditions, allowing a single offsite power feed to supply all required divisions.

(continued)

BASES

LCO (continued)

Diesel fuel oil and starting air support systems are addressed in LCO 3.8.3, "Diesel Fuel Oil and Starting Air."

Automatic DG start on loss of power is addressed in LCO 3.3.5, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation."

Each engine lubrication oil sump contains an inventory capable of supporting a minimum of 7 days of operation. This supply is sufficient to allow the operator to replenish lube oil from outside sources. OPERABILITY also requires the quantity of lube oil be maintained with the sightglass to assure an adequate 7 day supply.

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6, during movement of irradiated fuel assemblies in the containment or fuel handling buildings, during CORE ALTERATIONS, and when required to support the Fuel Handling Building Exhaust Filter System, provides assurance that:

a. Systems needed to mitigate a fuel handling accident are available;

b. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

c. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.1.

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Inverters – Shutdown

LCO 3.8.8 AC instrument bus inverters shall be OPERABLE to support the onsite Class 1E AC instrument bus electrical power distribution division(s) required by LCO 3.8.10, "Distribution Systems – Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies in the containment or fuel handling buildings,
During CORE ALTERATIONS,
During conditions when the Fuel Handling Building Exhaust Filter System is required OPERABLE or in operation per LCO 3.7.13.

ACTIONS

-NOTES-

1. LCO 3.0.3 is not applicable.
2. Enter the applicable Conditions and Required Actions of LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP)," for the associated LTOP features made inoperable by the AC instrument bus inverter.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC instrument bus inverters inoperable.	A.1 Declare required feature(s) inoperable. <u>OR</u>	Immediately

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.8 Inverters – Shutdown

BASES

BACKGROUND

A description of the inverters is provided in the Bases for LCO 3.8.7, "Inverters – Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 15 (Ref. 1), assume various safety systems are OPERABLE. The inverters are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to the Reactor Protection System and other safety system instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the inverters is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum inverters to each required AC instrument bus during MODES 5 and 6, during movement of irradiated fuel assemblies in the containment or fuel handling buildings, **during CORE ALTERATIONS, and during conditions when the Fuel Handling Building Exhaust Filter** System is required OPERABLE or in operation ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate power is available to mitigate events postulated during shutdown, such as a low temperature overpressurization event or a fuel handling accident.

The inverters were previously identified as part of the assumed power sources for the distribution system and, as such, satisfy Criterion 3 of the NRC Policy Statement.

(continued)

BASES (continued)

LCO

The inverters ensure the availability of electrical power for the instrumentation for systems required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated DBA. The unit-specific inverters provide uninterruptable supply of AC electrical power to the AC instrument buses even if the respective 4.16 kV bus is de-energized. This ensures the availability of sufficient inverter power sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

An OPERABLE inverter must be supplied power from its associated Class 1E battery, and supplying the associated AC instrument bus with acceptable output AC voltage. Alternately, the power supply to the inverter may be from the internally rectified AC source, provided the Class 1E battery feed is OPERABLE as the backup uninterruptable power supply.

APPLICABILITY

The inverters required to be OPERABLE in MODES 5 and 6 during movement of irradiated fuel assemblies during CORE ALTERATIONS, and during conditions when the Fuel Handling Building Exhaust Filter System is required OPERABLE or in operation provides assurance that:

a. Systems to mitigate a low temperature overpressurization event are available;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

Inverter requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.7.

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems - Shutdown

LCO 3.8.10 The necessary portions of AC, ESF, DC, and AC instrument bus electrical power distribution divisions shall be OPERABLE to support unit-specific and common equipment required to be OPERABLE.

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies in the containment or fuel handling buildings
During CORE ALTERATIONS,
During conditions when the Fuel Handling Building Exhaust Filter System is required OPERABLE or in operation per LCO 3.7.13.

ACTIONS

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

1. LCO 3.0.3 is not applicable.
2. Enter the applicable Conditions and Required Actions of LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP)," for the associated LTOP features made inoperable by the Electrical Power Distribution System.
3. Enter the applicable Conditions and Required Actions of LCO 3.4.7, "RCS Loops - MODE 5," for RHR shutdown cooling made inoperable by the Electrical Power Distribution System.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more required AC ESF, DC, or AC instrument bus divisions inoperable.	A.1	Declare supported required feature(s) inoperable.	Immediately
	<u>OR</u>		
			(continued)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.10 Distribution Systems – Shutdown

BASES

BACKGROUND

A description of the AC Engineered Safety Feature (ESF), DC, and AC instrument bus electrical power distribution systems is provided in the Bases for LCO 3.8.9, "Distribution Systems – Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident and transient analyses in the UFSAR, Chapter 15 (Ref. 1), assume various safety systems are OPERABLE. The AC ESF, DC, and AC instrument bus electrical power distribution divisions are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to safety systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the necessary AC ESF, DC, and AC instrument bus electrical power distribution division(s) is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum AC ESF, DC, and AC instrument bus electrical power distribution divisions during MODES 5 and 6, during movement of irradiated fuel assemblies in the containment or fuel handling buildings during CORE ALTERATIONS, and during conditions when the Fuel Handling Building Exhaust Filter System is required OPERABLE or in operation ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate power is provided to mitigate events postulated during shutdown, such as a low temperature overpressurization event or a fuel handling accident.

(continued)

BASES

APPLICABLE SAFETY ANALYSIS (continued)	The AC and DC electrical power distribution divisions satisfy Criterion 3 of the NRC Policy Statement.
LCO	Various combinations of subsystems, equipment, and components are required OPERABLE by other LCOs, depending on the specific plant condition. Implicit in those requirements is the required OPERABILITY of necessary support required features. This LCO explicitly requires energization of the portions of the electrical distribution system necessary to support OPERABILITY of required systems, equipment, and components - all specifically addressed in each LCO and implicitly required via the definition of OPERABILITY. Maintaining these portions of the distribution system energized ensures the availability of sufficient power to operate the unit in a safe manner to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents and low temperature overpressurization events).
APPLICABILITY	The AC and DC electrical power distribution divisions required to be OPERABLE in MODES 5 and 6, during movement of irradiated fuel assemblies in the containment or fuel handling buildings, during CORE ALTERATIONS, and during conditions when the Fuel Handling Building Exhaust Filter System is required OPERABLE or in operation provides assurance that: a. Systems to mitigate a low temperature overpressurization event are available; b. Systems to mitigate a fuel handling accident are available; c. Systems to mitigate the effects of events that can lead to core damage during shutdown are available; and d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition and refueling condition.

(continued)

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New INSERT 18A

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources - Shutdown

NEW

terms

LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:

a. One qualified ~~circuit~~ feed between the offsite transmission network and the onsite Class 1E AC electrical power distribution ~~subsystem(s)~~ division(s) required by LCO 3.8.10, "Distribution Systems - Shutdown"; and

unit specific

b. One diesel generator (DG) capable of supplying one ~~train~~ division of the onsite Class 1E AC electrical power distribution ~~subsystem(s)~~ division(s) required by LCO 3.8.10.

DOD 3.8-43

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies in the containment or fuel handling buildings. (25)

ACTIONS ----- NOTE -----
LCO 3.0.3 is not applicable (13)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite ~~circuit~~ feed inoperable.	------------NOTE------------ Enter applicable Conditions and Required Actions of LCO 3.8.10, with one required ~~train~~ division de-energized as a result of Condition A. ----------------------------	
	A.1 Declare ~~affected~~ required feature(s) with no offsite power available inoperable.	Immediately
	OR	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
		(continued)

Edit

SERT 18A

CO 3.8.2 The following AC electrical power sources required to support the onsite Class 1E AC electrical power distribution division(s) required by LCO 3.8.10, "Distribution Systems – Shutdown" shall be OPERABLE:

a. One qualified feed from the offsite transmission network;

b. One unit-specific diesel generator (DG), when in MODES 5 or 6;

c. One DG capable of supplying the onsite 1E electrical power distribution division required in support of the Control Room Emergency Filtration System (LCO 3.7.9) and the Control Room Ventilation System (LCO 3.7.10) during movement of irradiated fuel in the containment or fuel handling building, and during CORE ALTERATIONS; and

d. One DG capable of supplying the onsite 1E electrical power distribution division required in support of the Fuel Handling Building Exhaust Filter System (LCO 3.7.13).

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies in the containment or fuel handling buildings,
During CORE ALTERATIONS,
During conditions when the Fuel Handling Building Exhaust Filter System is required to be OPERABLE or in operation per LCO 3.7.13.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.2 AC Sources—Shutdown

BASES

BACKGROUND

A description of the AC sources is provided in the Bases for LCO 3.8.1, "AC Sources—Operating."

APPLICABLE SAFETY ANALYSES

[WOG-13,09]

The OPERABILITY of the minimum AC sources and during MODES 5 and 6 ensures that: during movement of irradiated fuel assemblies in the Containment or Fuel handling buildings, during

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

CORE ALTERATIONS, and when required to support the Fuel Hand building Exhaust Filter System

b. Sufficient ~~instrumentation and control capability~~ is available for monitoring and maintaining the unit status; and

[BWOG-06]

c. Adequate AC electrical power is provided to mitigate events postulated during shutdown, such as ~~an inadvertent draindown of the vessel or~~ a fuel handling accident.

clarification

~~is not required to be assumed~~

~~with the~~

System conditions (i.e., the

In a shutdown condition

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. ~~However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required~~. The rati~~onale for this is based on the fact that many~~ Design Basis Accidents (DBAs) that are analyzed in MODES 1, 2, 3, and 4 have no specific analyses in MODES 5 and 6. Worst case bounding events are deemed not credible in MODES 5 and 6 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

During MODES 1, 2, 3, and 4, various deviations from the analysis assumptions and design requirements are allowed within the Required Actions. This allowance is in

Insert B34A

(continued)

ASES

PPLICABLE
AFETY ANALYSES
(continued)

recognition that certain testing and maintenance activities must be conducted provided an acceptable level of risk is not exceeded. During MODES 5 and 6, performance of a significant number of required testing and maintenance activities is also required. In MODES 5 and 6, the activities are generally planned and administratively controlled. Relaxations from MODE 1, 2, 3, and 4 LCO requirements are acceptable during shutdown modes based on:

a. The fact that time in an outage is limited. This is a risk prudent goal as well as a utility economic consideration.

b. Requiring appropriate compensatory measures for certain conditions. These may include administrative controls, reliance on systems that do not necessarily meet typical design requirements applied to systems credited in operating MODE analyses, or both.

c. Prudent utility consideration of the risk associated with multiple activities that could affect multiple systems.

d. Maintaining, to the extent practical, the ability to perform required functions (even if not meeting MODE 1, 2, 3, and 4 OPERABILITY requirements) with systems assumed to function during an event.

In the event of an accident during shutdown, ~~this LCO~~ ensures the capability ~~to support~~ systems necessary to avoid immediate difficulty~~, assuming either a loss of all offsite power or a loss of all onsite diesel generator (DG) power.~~

Z

The AC sources satisfy Criterion 3 of the NRC Policy Statement.

clarification

DOD 3.8-43

LCO

feed
division
required by

One offsite ~~circuit~~ feed capable of supplying ~~the onsite~~ Class 1E electrical power distribution ~~subsystem~~(s) division ~~of~~ LCO 3.8.10, "Distribution Systems—Shutdown," ensures that all required loads are powered from offsite power. An OPERABLE DG, associated with a distribution system ~~train~~ division required to be OPERABLE by LCO 3.8.10, ensures a diverse power source is available to provide electrical power support, assuming a loss of the offsite ~~circuit~~ feed. Together, OPERABILITY of the required

unit specific

(continued)

BASES

LCO (continued)

offsite ~~circuit~~ feed and DG ensure the availability of sufficient AC sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents) ~~and reactor vessel draindown~~.

The qualified offsite ~~circuit~~ feed must be capable of maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the Engineered Safety Feature (ESF) bus(es). ~~Qualified offsite circuits are those that are described in the FSAR and are part of the licensing basis for the unit.~~

INSERT B 36A

[n specific ails add]

~~Offsite circuit #1 consists of Safeguards Transformer B, which is supplied from Switchyard Bus B, and is fed through breaker 52-3 powering the ESF transformer XNB01, which, in turn, powers the #1 ESF bus through its normal feeder breaker. The second offsite circuit consists of the Startup Transformer, which is normally fed from the Switchyard Bus A, and is fed through breaker PA 0201 powering the ESF transformer, which, in turn, powers the #2 ESF bus through its normal feeder breaker.~~

ERT B

The required DG must be capable of starting, accelerating to rated speed and voltage, and connecting to its respective ESF bus on detection of bus undervoltage. This sequence must be accomplished ~~within [10]~~ in ≤ 12 seconds. The DG must be capable of accepting required loads within the assumed loading sequence intervals, and continue to operate until offsite power can be restored to the ESF buses. These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot, and DG in standby at ambient conditions~~, and DG operating in a parallel test mode~~.

INCLUDED DUE I SIGNALS NOT UIRED IN MODES 5 AND 6 at Zion

SERT -17 Ca

~~Proper sequencing of loads, including tripping of nonessential loads, is a required function for DG OPERABILITY.~~

~~In addition, proper sequencer operation is an integral part of offsite circuit OPERABILITY if its inoperability in any way impacts on the ability to start and maintain energized any loads required OPERABLE by LCO 3.8.10.~~

oads not quenced to offsite POWER

(continued)

INSERT B34A

For a unit in MODES 5, 6, during movement of irradiated fuel assemblies in the containment or fuel handling buildings, during CORE ALTERATIONS, or when required to support the required Fuel Handling Building Exhaust Filter System, the licensing basis for the shutdown AC Sources is a DBA for the unit that is shutdown that does not require Safety Injection to be initiated (e.g., fuel handling accident) combined with a dual-unit LOOP. For the unit that is still at power the licensing basis for the AC Sources is a DBA that requires Safety Injection to be initiated to mitigate the accident coincident with a unit-specific Loss of Off-site Power (LOOP). In addition, a dual-unit LOOP is also considered a design-basis accident for shutdown conditions.

The OPERABILITY of the necessary shutdown AC sources is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

These limitations for shutdown conditions are based on maintaining availability of at least one train of Control Room Emergency Filtration System (CREF), Control Room Ventilation System (CRVS), and Fuel Handling Building Exhaust Filter System. Because these are shared between both units, with the potential to be powered from any DG, the required DGs are not identified as a unit-specific DG, but are identified by the system trains that are required.

During movement of irradiated fuel in the containment or fuel handling building, during CORE ALTERATIONS, or when required by the Fuel Handling Building Exhaust Filter System, this LCO ensures that in the event of an accident the capability to support systems necessary to avoid immediate difficulty is available.

INSERT B36A

Either the main or reserve offsite feed is capable of providing the required ESF bus loads. One offsite AC power feed and associated protective relaying is required to meet LCO 3.8.2.a.

For Unit 1, the main qualified offsite feed consists of a line from the 345 kV switchyard bus 7, to system auxiliary transformer (SAT) 142, breakers 1422, 1432, 1442, 1424, 1471, 1434, 1481, 1444, 1491 and buses 142, 143, and 144. The reserve qualified offsite feed consists of a line from the 345 kV switchyard bus 3 to SAT 242, breakers 2412, 1472, 1482, 1492 and bus 241. For Unit 2, the main qualified offsite feed consists of a line from the 345 kV switchyard bus 3, to (SAT) 242, breakers 2422, 2432, 2442, 2424, 2471, 2434, 2481, 2444, 2491 and buses 242, 243 and 244. The reservc qualified offsite feed consists of a line from the 345 kV switchyard bus 7 to SAT 142, breakers 1412, 2472, 2482, 2492 and bus 141.

The ESF buses may also be powered by backfeeding through the main power transformer (MPT). This method is credited as a qualified offsite power supply, if the unit is in MODE 5 or 6, or defueled, since the protective relaying and trip circuits provide protection equivalent to the main and reserve offsite feeds. As such, it may be used to satisfy the requirements of LCO 3.8.2.a. For Unit 1 this feed consists of a line from the 345 kV switchyard to MPT 1E and 1W, breakers 1421, 1431, 1441, 1424, 1434, 1444, 1471, 1481, 1491, buses 142, 143, 144, and the associated protective relaying. For Unit 2, this feed consists of a line from the 345 kV switchyard to MPT 2E and 2W, breakers 2421, 2431, 2441, 2424, 2434, 2444, 2471, 2481, 2491, buses 242, 243, 244, and the associated protective relaying.

onsite 1E electrical power distribution

a unit-specific   the   RHR

To ensure a diverse power source is available to support equipment required to be OPERABLE, ~~the~~ DG must be capable of supplying ~~an~~ appropriate division ~~for the specific shutdown~~. For example, in Mode 5 with a Residual Heat Removal loop required to be OPERABLE, the required DG would need to supply a division supporting an OPERABLE Residual Heat Removal loop. Similarly, when the Control Room Emergency Filtration System is required to be OPERABLE during movement of irradiated fuel assemblies in the containment or the fuel handling buildings the diverse power source for the appropriate division may be supplied by a DG which could be associated with the other unit.

INSERT B36B

When required to support the Fuel Handling Building Exhaust Filter System and a DG capable of supplying the onsite 1E electrical power distribution division required in support of the required Fuel Handling Building Exhaust Filter System (LCO 3.7.13) is required. This DG may be associated with the opposite unit.

For example, during conditions when a Fuel Handling Building Exhaust Filter System train is required to be OPERABLE or in operation (during movement of CORE ALTERATIONS with the equipment hatch not intact), the power supply for the associated division may be supplied from a DG associated with the other unit.

(continued) It is acceptable for ~~trains~~ divisions to be cross tied during shutdown conditions, allowing a single offsite power ~~circuit~~ feed to supply all required ~~trains~~.

INSERT B37A

APPLICABILITY The AC sources required to be OPERABLE in MODES 5 and 6, ~~and~~ during movement of irradiated fuel assemblies in the Containment or Fuel handling buildings, and when required during CORE ALTERATIONS, provides assurance that:

[Z]-EC]

~~a.~~ ~~Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core in case of an inadvertent draindown of the reactor vessel;~~ to support the Fuel Handling Building Exhaust Filter System

a. ~~b.~~ Systems needed to mitigate a fuel handling accident are available;

c. ~~c.~~ Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

c. ~~d.~~ Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.1.

ACTIONS INSERT B37B, A.1

An offsite ~~circuit~~ feed would be considered inoperable if it were not available to ~~one~~ any required ESF ~~train~~ bus. Although two ~~or more~~ ~~trains are~~ divisions may be required by LCO 3.8.10, ~~the~~ one ~~train~~ bus with offsite power available may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS, and fuel movement, ~~and operations with a potential for draining the reactor vessel~~. By the allowance of the option to declare required features inoperable, with no offsite power available, appropriate restrictions will be implemented in accordance with the affected required features LCO's ACTIONS. (subsystems or individual components)

[...-06] and

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Inverters – Shutdown

AC instrument bus

divisions(s)

LCO 3.8.8 Inverters shall be OPERABLE to support the onsite Class 1E AC ~~vital~~ instrument bus electrical power distribution ~~subsystem(s)~~ required by LCO 3.8.10, "Distribution Systems – Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies in the containment or fuel handling building, — During CORE ALTERATIONS, 25 13 34
During Conditions when the Fuel Handling Building Exhaust Filter System required OPERABLE with operation per LCO 3.7.13.

ACTIONS ← {Add Note: 1. LCO 3.0.3 NA 2. For entry in LCO 3.4.12, "LTOP"}

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more ~~{required}~~ AC instrument bus inverters inoperable.	A.1	Declare ~~affected~~ required feature(s) inoperable.	Immediately
	OR		
	A.2.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	A.2.2	Suspend movement of irradiated fuel assemblies in the containment and fuel handling buildings.	Immediately
	AND		
	A.2.3	Initiate action to suspend operations with a potential for draining the reactor vessel.	Immediately
	AND		

(continued)

25

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B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.8 Inverters—Shutdown

BASES

BACKGROUND

A description of the inverters is provided in the Bases for LCO 3.8.7, "Inverters—Operating."

APPLICABLE SAFETY ANALYSES

= BWR-08

The initial 1 conditions of u Design Basis Accident (DBA) and transient analyses in the FSAR, ~~Chapter [6] (Ref. 1) and~~ Chapter ~~[15]~~ (Ref. ~~2~~), assume Engineered Safety Feature systems are OPERABLE. The ~~DC to AC~~ inverters are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to the Reactor Protective System and Engineered Safety Features Actuation System instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the inverters is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

[WOG-13]

25 during movement of irradiated fuel assemblies in the Containment or fuel handling buildings, during CORE ALTERATIONS, and during conditions when the Fuel Handling Building Exhaust Filter System is required OPERABLE or in operation per LCO 3.7.13

The OPERABILITY of the minimum required inverters to each AC instrument ~~vital~~ bus during MODES 5 and 6, ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate power is available to mitigate events postulated during shutdown, such as ~~an inadvertent draindown of the vessel~~ a low temperature overpressurization event or a fuel handling accident.

[BWOG-06]

[Ed] assumed power sources for the

The inverters were previously identified as part of the distribution system and, as such, satisfy Criterion 3 of the NRC Policy Statement.

BASES (continued)

LCO

The inverters ensure the availability of electrical power for the instrumentation for systems required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated DBA. The unit-specific ~~battery powered~~ inverters provide uninterruptible supply of AC electrical power to the AC instrument ~~vital~~ buses even if the respective 4.16 kV safety bus~~es~~ is ~~are~~ de-energized. OPERABILITY of the inverters requires that the AC instrument ~~vital~~ bus be powered by the inverter. This ensures the availability of sufficient inverter power sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents), ~~and inadvertent reactor vessel draindown).~~

[WOG-06]

APPLICABILITY

The inverters required to be OPERABLE in MODES 5 and 6, ~~and~~ during movement of irradiated fuel assemblies, provides assurance that:

[WOG-06]

a. Systems to mitigate a low temperature overpressurization event ~~provide adequate coolant inventory makeup~~ are available; ~~for the irradiated fuel in the core in case of an inadvertent draindown of the reactor vessel;~~

b. Systems needed to mitigate a fuel handling accident are available;

CORE ALTERATIONS, during conditions when fuel handling building ... filter system is required OPERABLE or in operation per LCO 3.7.13

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

Inverter requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.7.

INSERT E74-

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, A.2.4, and ~~A.2.5~~

If two or more divisions ~~trains~~ are required by LCO 3.8.10, "Distribution Systems—Shutdown," the remaining OPERABLE Inverters may be capable of supporting sufficient required features to allow

(continued)

NEW terms

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems – Shutdown

LCO 3.8.10 The necessary portions of AC, ESF DC, and AC ~~vital~~ instrument bus electrical power distribution subsystems shall be OPERABLE to support equipment required to be OPERABLE.

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies in the Containment or fuel handling buildings, During CORE ALTERATIONS, During conditions when the Fuel Building Exhaust Filter System is required OPERABLE or in operation per LCO 3.7.13 (25) (13) (24)

ACTIONS {Add Notes 1. LCO 3.0.3 NA 2. for LTOP & 3. RHR-SDC}

EDIT terms

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC, ESF DC, or AC ~~vital~~ instrument bus ~~electrical power distribution subsystems~~ divisions inoperable.	A.1 Declare ~~associated~~ supported required feature(s) inoperable.	Immediately
	OR	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2.2 Suspend movement of irradiated fuel assemblies in the Containment and fuel handling buildings. (25)	Immediately
	AND	
	A.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel.	Immediately
	AND	
		(continued)

BWOG-06

L POWER SYSTEMS

ibution Systems—Shutdown

A description of the AC ESF, DC, and AC ~~vital~~ instrument bus electrical power distribution systems is provided in the Bases for LCO 3.8.9, "Distribution Systems—Operating."

YSES

The initial conditions of Design Basis Accident and transient analyses 1 in the UFSAR, ~~Chapter [6] (Ref. 1) and Chapter [15] (Ref. 2)~~, assume Engineered Safety Feature (ESF) systems are OPERABLE. The AC ESF, DC, and AC ~~vital~~ bus electrical power distribution ~~systems~~ are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

s

ent

The OPERABILITY of the AC ESF, DC, and AC ~~vital~~ bus electrical power distribution ~~system~~ is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

divisions

The OPERABILITY of the minimum AC ESF, DC, and AC ~~vital~~ bus electrical power distribution ~~subsystems~~ divisions during MODES 5 and 6, ensures that:

ring
nent of
ated fuel
es in the
ment or fuel
buildings,
CORE ALTERATIONS,
ing conditions when
Handling Building Exhaust
System is required
BLE and in operation
per LCO 3.7.13

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate power is provided to mitigate events postulated during shutdown, such as ~~an inadvertent draindown of the vessel~~ a low temperature overpressurization event or a fuel handling accident.

The AC and DC electrical power distribution ~~systems~~ divisions satisfy Criterion 3 of the NRC Policy Statement.

(continued)

BASES (continued)

LCO

Various combinations of subsystems, equipment, and components are required OPERABLE by other LCOs, depending on the specific plant condition. Implicit in those requirements is the required OPERABILITY of necessary support required features. This LCO explicitly requires energization of the portions of the electrical distribution system necessary to support OPERABILITY of required systems, equipment, and components—all specifically addressed in each LCO and implicitly required via the definition of OPERABILITY.

Maintaining these portions of the distribution system energized ensures the availability of sufficient power to operate the unit in a safe manner to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents and ~~inadvertent reactor vessel draindown).~~ low temperature overpressurization events).

[WOG-06]

APPLICABILITY

The AC and DC electrical power distribution ~~subsystems~~ divisions required to be OPERABLE in MODES 5 and 6, ~~and~~ during movement of irradiated fuel assemblies, [in the Containment or fuel handling buildings], during CORE ALTERATIONS and during conditions when the Fuel Handling Building Exhaust Filter System is required OPERABLE [or in operation per LCO 3.7.13] provides assurance that:

a. Systems to ~~provide adequate coolant inventory makeup~~ mitigate a low temperature overpressurization event ~~in the core~~ are available; ~~for the irradiated fuel in the core in case of an inadvertent draindown of the reactor vessel~~;

[WOG-06]

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition and refueling condition.

The AC, ESF DC, and AC ~~vital~~ instrument bus electrical power distribution ~~subsystems~~ division requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.9.

(continued)

DOD CHANGES

CHANGE NUMBER	DISCUSSION
22.	NUREG SR 3.8.1.12 - This requirement has not been included in Zion Stations ITS. This specific Surveillance Requirement is not part of Zion Stations current licensing basis, and has been concluded that it does not warrant inclusion into the ITS. The capability of the DG to start is tested on a quarterly basis as part of the ESF Logic channel function tests. Ensuring that the DG starts and runs unloaded is not specifically addressed as an acceptance criterion, but if the DG did not perform as designed, would prompt an operability determination. Based on this information, Zion Station has concluded that the intent of this requirement is being met today under licensee control.
23.	NUREG SR 3.8.1.18 - The NUREG SR specifies a tolerance (± a certain percentage) about which each sequenced load block is tested. For Zion Station the tolerance has been eliminated and the SR now requires each sequenced load block interval to be within the design limit. This is because the tolerances for loads sequenced on the DGs have been evaluated on a per component basis. Development of the various tolerances considered time for the DGs to restore voltage and frequency prior to applying the next sequenced load and that the assumptions related to ESF equipment time delays are not violated. As such, specifying a fix tolerance in the SR may result in exceeding the analytical value determined for a given component. Therefore, acceptance of the revised SR is based on not exceeding the design limit. The design limit includes both the upper and lower ranges of the calculated tolerance for a given component.
24.	NUREG SR 3.8.1.11, SR 3.8.1.19, SR 3.8.1.20 - The NUREG use of "from standby conditions" is modified for plant specific design and terminology. Since the DG is expected to be able to start from both conditions, there is no need to specify "from standby conditions" in any SR except the 31 day, 184 day and 18 month "LOOP/LOCA" test. The standby conditions for this test have been further described as "normal" standby conditions, which are identified in the Bases, to assure the test begins from ambient conditions.
25.	NUREG LCO 3.8.2, Applicability & Cond. A & B, & LCO 3.8.5, Applicability & Cond. A, & LCO 3.8.8, Applicability & Cond. A, & LCO 3.8.10, Applicability & Cond. A - These revisions are proposed to provide additional clarification regarding the locations of fuel movement activities, and other activities where the systems are required OPERABLE. This is an editorial change to prevent future confusion.

MARK UP OF ITS CHANGE

OI 3.7-15, LCO 3.7.8; Modification of LCO 3.7.8, Service Water

In response to NRC and Zion review, and as a result of design review of SW System capacity, the LCOs, Conditions, and Required Actions for SW have been rewritten to take into account potential flow capacity issues with the SW System. In addition, a new surveillance has been added that verifies weekly that system configuration is within the bounds of the analysis.

3.6 CONTAINMENT SYSTEMS

3.6.6 Containment Spray (CS) and Reactor Containment Fan Cooler (RCFC) Systems

LCO 3.6.6 Three CS trains, two CS recirculation headers and five RCFCs shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CS train inoperable.	A.1 Restore CS train to OPERABLE status.	72 hours AND 14 days from discovery of failure to meet the LCO
B. One CS recirculation header inoperable.	B.1 Restore CS recirculation header to OPERABLE status.	7 days AND 14 days from discovery of failure to meet the LCO
C. One RCFC inoperable.	C.1 Restore RCFC to OPERABLE status.	7 days AND 14 days from discovery of failure to meet the LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A, B or C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours AND 84 hours
E. Two RCFCs inoperable.	E.1 Restore one RCFC to OPERABLE status.	72 hours
F. Required Action and associated Completion Time of Condition E not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.1	Operate each RCFC at low speed for ≥ 15 minutes.	31 days
~~SR 3.6.6.2~~	~~Verify each RCFC cooling water flow rate is ≥ 1600 gpm.~~	~~31 days~~
SR 3.6.6.~~3~~2	Verify the diesel driven CS pump fuel oil day tank contains ≥ 46 gallons of fuel oil.	31 days
SR 3.6.6.~~4~~3	Verify the diesel driven CS pump fuel oil properties are tested in accordance with, and maintained within the limits of the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.6.6.~~5~~4	Verify each automatic CS valve in the flow path that is not locked, sealed, or otherwise secured in position actuates to the correct position on an actual or simulated actuation signal.	18 months
SR 3.6.6.~~6~~5	Verify each CS pump starts automatically on an actual or simulated actuation signal.	18 months
SR 3.6.6.~~7~~6	Verify each RCFC starts automatically on an actual or simulated actuation signal.	18 months

(continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6.~~8~~7	Verify the Accident Inlet, Accident Outlet, and Normal Inlet RCFC dampers that are not locked, sealed, or otherwise secured in their accident position, are in the accident position.	18 months
SR 3.6.6.~~9~~8	Verify each spray nozzle is unobstructed.	10 years

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~SR 3.6.6.2~~

~~Verifying the SW cooling flow rate to each RCFC unit is ≥ 1600 gpm provides assurance that the design flow rate assumed in the safety analyses will be achieved (Ref. 3). The Frequency was developed considering the known reliability of the cooling water system, the redundancy available, and the low probability of a significant degradation of flow occurring between surveillances.~~

SR 3.6.6.2~~3~~

Verifying that the diesel driven containment spray pump fuel oil day tank contains greater than or equal to 46 gallons of fuel oil provides assurance that adequate fuel is available to power the diesel driven containment spray pump for the length of time (approximately 77 minutes) it is credited when operating in response to a design basis accident and includes a small margin for calculation conservatism (Ref. 3). The 31 day Frequency is based on the available alarm indication provided in the control room of a low level in the tank.

SR 3.6.6.3~~4~~

Specification 5.5.11, "Diesel Fuel Oil Testing Program," specifies the required testing of both new fuel oil and stored fuel oil in accordance with the applicable ASTM Standards. Since the diesel driven CS pump fuel oil tank is typically filled from an OPERABLE emergency diesel generator storage tank, the performance of new fuel oil testing is not required. This is because the fuel oil has already been analyzed before being added to the emergency diesel generator storage tanks. However, if fuel oil in an emergency diesel generator storage tank has been determined to not meet the requirements of Specification 3.8.3, "Diesel Fuel Oil and Starting Air," after it has been added to the diesel driven CS pump fuel oil tank, or the fuel oil to be added is from a source other than an OPERABLE emergency diesel generator storage tank, then the new fuel oil must be tested in accordance with the Diesel Fuel Oil Testing Program.

Stored fuel oil degradation shows up as an increase in particulate, due mostly to oxidation. The presence of particulate does not mean the fuel oil will not burn

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.6.3~~4~~ (continued)

properly in a diesel engine. However, the particulate can cause fouling of filters and fuel oil injection equipment which can cause engine failure.

Stored fuel oil particulate concentrations should be determined in accordance with ASTM D2276, Method A-2 or Method A-3. This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing.

The Frequency of 31 days for testing the stored fuel considers fuel oil degradation trends which indicate that particulate concentration is unlikely to change significantly during this period.

SR 3.6.6.4~~5~~ and SR 3.6.6.5~~6~~

These SRs require verification that each automatic CS valve actuates to its correct position and that each CS spray pump starts upon receipt of an actual or simulated actuation of a containment High-High pressure signal coincident with a SI signal. This surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillances were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillances when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.6.6~~7~~

This SR requires verification that each RCFC actuates upon receipt of an actual or simulated safety injection signal. The 18 month Frequency is based on engineering judgment and on operating experience which has shown that these components usually pass the surveillances when performed at

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.6.6~~7~~ (continued)

the 18 month frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.6.7~~8~~

Verifying the correct alignment of the RCFC accident dampers provides assurance that the proper flow path will exist for post accident RCFC operation. This SR does not apply to dampers that are fixed or otherwise secured in position, since these were verified to be in the correct position prior to being secured. This SR does not require any testing or damper manipulation. Rather it involves verification, through a system walkdown, that dampers capable of being mispositioned are in the correct position. The 18 month Frequency is based on the need to access the RCFCs and on operating experience which has shown these that these components usually pass this surveillance when performed at the 18 month Frequency.

SR 3.6.6.8~~9~~

With the spray header drained of any solution, low pressure air or smoke can be blown through test connections. This SR ensures that each spray nozzle is unobstructed and provides assurance that spray coverage of the containment during an accident is not degraded. Due to the passive design of the nozzle, a test at 10 year intervals is considered adequate to detect obstruction of the nozzles.

REFERENCES

1. UFSAR, Section 6.5.2.
2. UFSAR, Section 6.2.2.
3. UFSAR, Section 15.6.
4. UFSAR, Section 15.0.

3.7 PLANT SYSTEMS

3.7.8 Service Water (SW) System

LCO 3.7.8 The SW System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

-----------------------------------NOTE-----------------------------------
Enter the applicable Conditions and Required Actions for systems made inoperable by SW System cross-tie and loop header isolation valves.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. --------NOTE-------- Separate Condition entry allowed for each loop header. -------------------- Automatic alignment capability of one required loop header isolation valve inoperable.	A.1 Open the affected valve.	7 days
B. Automatic alignment capability of one required turbine building branch header isolation valve inoperable on one or more turbine building branch header(s).	B.1 Isolate the affected flow path.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. --------NOTE-------- Separate Condition entry allowed for each valve. -------------------- ~~Required b~~Booster pump suction isolation valve inoperable (if required). <u>OR</u> ~~Required s~~Strainer backwash header isolation valve inoperable (if required).		---------NOTE-------- Valve may be opened intermittently under administrative controls. ---------------------	
	C.1	Isolate the affected flow path.	7 days
D. ~~One required SW pump inoperable.~~SW System configuration not in accordance with requirements of SR 3.7.8.1.	D.1	Verify SW System configuration is within flow capabilities of OPERABLE SW pumps.	8 hours~~7 days~~
	<u>AND</u>		
	~~D.2.1~~	~~Restore required SW pump to OPERABLE status.~~ ~~<u>OR</u>~~	
	D.2	Restore SW System configuration in accordance with requirements of SR 3.7.8.1.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. SW System supply header cross-tie or loop header isolation capability inoperable. OR One SW System supply header inoperable.	E.1 Restore SW System to OPERABLE status.	30 days
F. Required Action and associated Completion Time not met. OR Two or more required SW pumps inoperable.	F.1 Be in MODE 3. AND F.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	Verify SW System configuration.	7 days
SR 3.7.8.2~~1~~	Verify each required SW System automatic valve in the flow path that is not locked, sealed, or otherwise secured in position actuates to the correct position on an actual or simulated actuation signal.	18 months

SURVEILLANCE		FREQUENCY
SR 3.7.8.3~~2~~	-------------------NOTE------------------- Not required when required opposite unit pump~~s~~ ~~are~~ is in operation. -- Verify each required SW pump starts automatically on an actual or simulated actuation signal.	18 months
SR 3.7.8.4~~3~~	-------------------NOTE------------------- Not required when required opposite unit pump~~s~~ ~~are~~ is in operation. -- Perform CHANNEL CALIBRATION of required opposite unit Low SW System Supply Header Pressure Channels.	18 months

B 3.7 PLANT SYSTEMS

B 3.7.8 Service Water (SW) System

BASES

BACKGROUND

The SW System is a shared system which provides a heat sink for the removal of process and operating heat from safety related components during a Design Basis Accident (DBA) or transient. During normal operation and shutdown, the SW System also provides this function for various safety related and non-safety related components. The SW System is also the backup safety related water supply to the Auxiliary Feedwater System and the normal supply for the Fire Protection System. The safety related function is covered by this LCO.

Six SW pumps (1SW001-1A, 1SW002-1B, 1SW003-1C, 2SW001-2A, 2SW002-2B, and 2SW003-2C) feed two 100% capacity safety related main supply headers. Each 100% supply header can be cross-tied such that both main supply headers can be supplied by all six SW pumps. Each header is capable of supplying all loads (safety and non-safety related) for either unit. All safety related loads supplied by the SW System are provided with redundant cooling water supplies from loop headers coming from each supply header. Each Safety Related header must be capable of being isolated and aligned to supply required loads in the event of a passive failure. The non-safety related loads are fed from separate branch headers that will be isolated when required from the supply headers under accident conditions.

When the turbine building SW cross connect line is not isolated, a flow path to the turbine building loads of the affected unit is created. This flow path does not automatically isolate upon receipt of a safety injection signal or a loss of power diesel generator start signal. Under this condition, the isolation of the turbine building branch header flow path associated with the affected unit does not isolate the turbine building loads of the affected unit and no significant reduction in the SW System load is accomplished by automatic alignment of the turbine building branch header isolation valves upon SW System actuation on a safety injection or loss of power diesel generator start signal.

The SW pumps, instrumentation, and piping and valves supplying the safety related loads are safety related.

(continued)

BASES

BACKGROUND (continued)

The pumps are automatically started and all safety related valves are aligned to their post accident positions upon receipt of a safety injection signal (from its associated unit). In addition, SW pump auto start signals are initiated by the safe shutdown sequencer on the associated unit and low SW supply header pressure on the opposite unit. Each SW pump has a separate pressure switch with different setpoints so that all pumps do not start at once. The lowest SW pump automatic start setpoint ensures adequate SW supply to safety related components and sufficient pressure in the Service Water System. In the event that offsite power is not available to either unit, the power source for SW pump 2SW001-2A may not be available since the common diesel generator will align to support Unit 1 equipment.

Automatic alignment of the branch header, loop header, booster pump suction, and strainer backwash header isolation valves occurs upon actuation of the SW System for the mitigation of a DBA or transient. These valves are identified in Table B 3.7.8-1, "Service Water System Supply Header Cross-tie and Isolation Valves." Automatic alignment of the loop header isolation valves to the open position ensures a flow path to each of the safety related loads supplied from the loop headers. The branch header, booster pump suction, and strainer backwash header flow paths provide SW to non-safety related loads and automatic alignment to the closed position reduces the demand on the SW System and increases the SW available to the safety related loads.

The Reactor Containment Fan Cooler (RCFC) and Diesel Generator (DG) loop header isolation valves each have the capability to isolate the loop header from one of the two SW System main supply headers. This function is required to ensure the capability to isolate a passive failure in a SW System main supply header. Operation with a DG loop header isolation valve open is acceptable provided the valve can be closed to ensure isolation capability in the event of a passive failure.

When the turbine building service water cross connect line is isolated, automatic alignment of the turbine building branch header isolation valves will result in a complete isolation

(continued)

BASES

BACKGROUND (continued)

of the turbine building loads of the affected unit. With the isolation of the turbine building flow paths, and the isolation of the booster pump suction and strainer backwash header flow paths, the SW System load demand is significantly reduced and the number of SW pumps required to be OPERABLE may potentially be reduced.

The Low SW System Supply Header Pressure auto start ensures each OPERABLE SW pump associated with the supply header of the unit not affected by a postulated Loss of Coolant Accident coincident with a Loss of Offsite Power event will start if not already operating.

Supply header cross-tie and isolation capability is also required to ensure passive failure protection capability in the recirculation phase of a LOCA, assuming no active failure has occurred. This capability is maintained through the OPERABILITY of the cross-tie and isolation valves listed in Table B 3.7.8-1, "Service Water System Supply Header Cross-tie and Isolation Valves." The valves contained within this table isolate the major flowpaths which present the greatest flooding hazard. Manual valves in other SW System supply header flowpaths are not addressed by this LCO since their associated piping diameter is small enough that they do not present a significant flooding hazard in the event of a passive failure.

The SW System supply headers may have the ~~cross-tie, main supply and loop header isolation valves~~main and loop cross-tie and the loop header isolation valves opened or closed in support of passive failure protection. The ~~cross-tie, main supply and loop header isolation valves~~main and loop cross-tie and the loop header isolation valves must be capable of being both opened and closed in order to isolate the affected flowpath and provide cooling water to the minimum required safety related components when the components supplied from the flow path are required to be OPERABLE. However, when the equipment within a flow path is not required to be OPERABLE, the main and loop cross-tie and the loop header isolation valves may be either closed or capable of being closed. The turbine building branch header, booster pump suction and strainer backwash header isolation valves are only required to be closed or capable of being closed since their intended safety function is to provide the capability to isolate a non-safety related portion of the SW System.

(continued)

BASES

BACKGROUND (continued)

The capability to open and close the SW System main and loop ~~supply header~~ cross-tie and the loop header isolation ~~cross tie, main supply and loop header~~ valves is predicated on the need to mitigate the consequences of a passive failure in the SW System. A passive failure of the SW System poses a potential flooding hazard for safety related components. The limiting coping time for this event is bounded by a passive failure of the SW System piping in the auxiliary building. In this event, floodwater would flow through floor drains and stairwells down to the 542 ft elevation. At this elevation, approximately 498,000 gallons of water could be held without affecting the RHR pump motors that are mounted up from the floor (Ref. 1). The maximum leakage rate assumed for a passive failure in the SW System is approximately 2400 gpm (Refs. 2 and 3). Thus, a coping time of approximately 3 1/2 hours is provided before flooding of the RHR pump motors occurs. To preclude the flooding of safety related components in the event of a passive failure in the SW supply piping and to provide an additional measure of conservatism, the capability must exist to position the required valves listed in Table B 3.7.8-1 within 3 hours. It should be noted however, that it is acceptable to administratively remove the valves listed in Table B 3.7.8-1 from service, or to have only manual positioning capability (without the use of a motor operator) provided all the required valves can be positioned within 3 hours.

Additional information about the design and operation of the SW System, along with a list of the components served, is presented in the UFSAR, Section 9.2.1 (Ref. 4).

APPLICABLE SAFETY ANALYSIS

The design basis of the SW System is to provide cooling for all essential loads. The design basis for the SW System, in conjunction with the CC System is to remove core decay heat following a design basis loss of coolant accident (LOCA) as discussed in the UFSAR, Section 6.2 (Ref. 5). This prevents the containment recirculation sump fluid from increasing in temperature during the recirculation phase following a LOCA and provides for a gradual reduction in the temperature of this fluid as it is supplied to the Reactor Coolant System by the Emergency Core Cooling System (ECCS) pumps.

(continued)

APPLICABLE SAFETY ANALYSIS (continued)

The SW System, in conjunction with the CC System, also cools the unit from residual heat removal (RHR) entry conditions (Ref. 6) to MODE 5 during normal and post accident operations. The time required for this evolution is a function of the decay heat load, and the number of CC and RHR System trains that are operating.

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

LCO

An OPERABLE SW System provides the required redundancy to ensure that the SW System safety functions can be accomplished assuming either; 1) loss of the onsite electric power system (diesel generators) assuming offsite power is available, or 2) loss of the offsite electric power system assuming onsite power (diesel generators) is available, coincident with a single failure (a passive failure is only assumed during the recirculation phase following a LOCA).

The SW System consists of two main supply headers and is operated as a shared system that provides cooling to equipment on both units. Passive failure of supply header piping or components requires the capability to isolate each supply header. This capability is maintained through the OPERABILITY of the cross-tie and isolation valves listed in Table B 3.7.8-1, "Service Water System Supply Header Cross-tie and Isolation Valves."

The SW System is OPERABLE when two supply headers are OPERABLE. A supply header must have at least one OPERABLE SW pump to be considered OPERABLE. OPERABILITY of the SW System also requires instrumentation and controls associated with pumps and valves that are required to automatically start and align upon actuation to be OPERABLE.

OPERABILITY of each turbine building branch header isolation valve includes the capability to automatically close upon actuation of the Loss of Power Diesel Generator Start Instrumentation.

The OPERABILITY of each turbine building branch header isolation valve associated with a unit in Modes 1, 2, 3, or 4 also includes the capability to close automatically upon

(continued)

BASES

safety injection.

LCO (continued)

The number of branch header isolation valves ~~and the number of SW pumps~~ required to be OPERABLE is ~~are~~ dependent upon the SW System flow and configuration. (Ref. 7)

~~The number of turbine building branch header isolation valves are required to be OPERABLE is four.~~ Two Turbine Building Branch Header Isolation Valves per turbine building branch header (four total) are required OPERABLE, unless one of the configurations listed below is satisfied.

A Turbine Building Branch Header Isolation Valve is not required ~~unless~~ under specific SW System configurations ~~are met~~. SW System configuration is independent of the Mode of either unit, except in specific circumstances, discussed in the BASES (Note: In the event that offsite power is not available to either unit, the power source for SW pump 2SW001-2A may not be available since the common diesel generator will align to support Unit 1 equipment). The~~se~~ SW System configurations ~~and~~for the number of turbine building branch header isolation valves required ~~to be OPERABLE when the configuration is met,~~ are as follows:

Two turbine building branch header isolation valves associated with the unit in Mode 1, 2, 3, or 4 are required when:

1. Only one unit is in Mode 1, 2, 3, or 4,
2. The turbine building branch header flow path of the other unit is isolated,
3. At least three Reactor Containment Fan Coolers and one Component Cooling Water Heat Exchanger are isolated, and
4. At least three SW pumps, not including SW pump 2SW001-2A, are OPERABLE.

No turbine building branch header isolation valves are required when:

1. At least five SW pumps, not including SW pump 2SW001-2A, are OPERABLE;
2. The following loads on the SW System are isolated:

(continued)

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b. Each of the following Temperature Control Valves OR its associated bypass valve:

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

~~such that only four SW pumps are required to automatically start and operate in response to accident or transient conditions.~~

No turbine building branch header isolation valves are required to be OPERABLE when:

1. At least four SW pumps, not including SW pump 2SW001-2A, are OPERABLE,
2. The following loads on the SW System are isolated:
   a. One Turbine Lube Oil Cooler on the operating unit and two Turbine Lube Oil Coolers on the shutdown unit,
   b. All hydrogen coolers on the shutdown unit,
   c. Three Reactor Containment Fan Cooler units,
   d. One Component Cooling heat exchanger,
   e. Each of the following Temperature Control Valves OR its associated bypass valve:

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222

(continued)

2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

f. Three Stator Water Coolers (One on the operating unit, two on the shutdown unit),
g. One Generator Air Side Seal Oil Cooler,
h. One H2 Seal Oil Cooler, and
i. Four Exciter Coolers.

Operability of each required opposite unit SW pump includes the capability to start automatically upon actuation of the low supply header pressure switch. This capability requires that the diesel generator associated with each OPERABLE SW pump is OPERABLE. Operability of each SW pump requires the associated supply header is OPERABLE.

The OPERABILITY of each SW pump associated with a unit in Modes 1, 2, 3, or 4 also includes the capability to start automatically when required to support the safety injection function.

The number of SW pumps required to be OPERABLE is dependent upon the number of SW pumps required to automatically start and operate in response to accident or transient conditions~~,~~ and which SW pumps are OPERABLE. The required SW System configuration and number of OPERABLE pumps is independent of the Mode of either unit (NOTE: The appropriate Mode for either unit may be constrained by the required SW System configuration and number of OPERABLE SW pumps). ~~and the operating mode of both units.~~

The number of ~~branch header isolation valves and the number of~~ SW pumps required to be OPERABLE is ~~are~~ dependent upon the SW System flow and configuration. (Ref. 7)

The number of SW pumps required to be OPERABLE is six provided that one Main Turbine Lube Oil Cooler per unit is isolated. For less than six OPERABLE SW Pumps, ~~unless~~ specific SW System configurations ~~are~~must be met. These SW System configurations and the minimum number of SW pumps required to be OPERABLE when ~~the configuration is met~~in this configuration, are as follows:

Five service water pumps are required to be OPERABLE given the following: ~~such that only four service water~~

(continued)

~~pumps are required to automatically start and operate in response to accident conditions.~~

a. One Turbine Lube Oil Cooler isolated per unit,
b. Each of the following Temperature Control Valves OR its associated bypass valve is isolated:

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

Four service water pumps are required to be OPERABLE given the following conditions: ~~such that only three SW pumps are required to automatically start and operate in response to accident or transient conditions.~~

1. The following loads on the SW System are isolated:
   a. One Turbine Lube Oil Cooler on the operating unit and two Turbine Lube Oil Coolers on the shutdown unit,
   b. All hydrogen coolers on the shutdown unit,
   c. Three Reactor Containment Fan Cooler units,
   d. One Component Cooling heat exchanger,
   e. Each of the following Temperature Control Valves OR its associated bypass valve for the operating unit for each of the following coolers:

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292

(continued)

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2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

f. Three Stator Water Coolers,
g. One Generator Air Side Seal Oil Cooler,
h. One H2 Seal Oil Cooler, and
i. Four Exciter Coolers.

Three SW pumps, not including SW pump 2SW001-2A, are required to be OPERABLE ~~when each supply header has at least one~~ with at least one OPERABLE SW pump in each supply header given the following conditions:

a. Only one unit is in Modes 1, 2, 3, or 4,
b. Two turbine building branch header isolation valves associated with the unit in MODE 1, 2, 3, or 4 are OPERABLE,
c. The turbine building branch header flow path of the other unit is isolated, and
d. At least three Reactor Containment Fan Coolers and one Component Cooling Water Heat Exchanger ~~is~~are isolated~~, and~~.

OPERABILITY of the branch and loop header isolation valves required to automatically align, includes actuation from the loss of power diesel generator start instrumentation. ~~This capability requires that the diesel generator associated with each OPERABLE SW pump is OPERABLE.~~ The OPERABILITY of each automatic branch and loop header isolation valve includes the capability to align automatically when required to support its safety injection function when associated with a unit in Modes 1, 2, 3, or 4.

OPERABILITY of the Booster Pump Suction valves and Strainer Backwash Header isolation valve is dependent upon the SW System flow and configuration. ~~These are required unless an additional OPERABLE SW pump may be substituted for this function.~~ The SW Strainer Backwash Header Isolation valve must be OPERABLE unless all six SW pumps are OPERABLE. SW Booster Pump Suction Isolation Valves must be OPERABLE unless at least five SW pumps are OPERABLE.

(continued)

BASES (continued)

APPLICABILITY

In MODES 1, 2, 3, and 4, the SW System is a normally operating system that is required to support the OPERABILITY of the equipment serviced by the SW System and required to be OPERABLE in these MODES.

In MODES 5 and 6, the OPERABILITY requirements of the SW System are determined by the systems and associated heat loads that it supports.

ACTIONS

The ACTIONS are modified by a Note, which ensures appropriate remedial actions are taken, if necessary, if the affected systems are rendered inoperable by an inoperable service water cross-tie or loop header isolation valve.

The number of branch header isolation valves and the number of SW pumps required to be OPERABLE are dependent upon the SW System flow and configuration. (Ref. 7) Therefore, an acceptable alternative to restoration of inoperable equipment may include system reconfiguration and flow reductions.

A.1

Loop header isolation valves must open to ensure adequate cooling of components performing safety related functions in response to conditions requiring actuation of the SW System. When the automatic alignment to the open position of a loop header isolation valve is inoperable, redundancy of the SW supply flow path to the affected safety related system is reduced. In the event of a DBA, the failure of the other isolation valve in the affected loop header to open if closed, could result in the loss of an adequate supply of SW to the affected safety related system unless the valve is open. For these reasons, the affected loop header isolation valve must be open. A Completion Time of 7 days to open the valve is acceptable based on the low probability of a DBA during this period.

Failure of an RCFC loop header isolation valve to open upon receipt of an actual or simulated Engineered Safety Features (ESF) actuation signal will not affect the RCFC loop header isolation valves capability to meet the requirements of LCO 3.6.3, "Containment Isolation Valves". However, failure of a RCFC loop header isolation valve to close will result in entry into the applicable conditions and required actions of

(continued)

ACTIONS

A.1 (continued)

LCO 3.6.3, "Containment Isolation Valves". The inability to provide service water flow to a RCFC will result in entry into the applicable conditions and required actions of LCO 3.6.6, "Containment Cooling and Reactor Containment Fan Cooler System".

Failure of a Diesel Generator (DG) loop header isolation valve to open upon receipt of an actual or simulated ESF actuation signal will not result in the associated DG being inoperable as long as the affected valve is placed in the open position. The inability to provide service water flow to a DG will result in entry into the applicable conditions and required actions of LCO 3.8.1, "AC Sources - Operating".

A Note is added to Condition A which allows separate condition entry for each loop header. This is acceptable since an inoperable isolation valve in another loop header does not further degrade the redundancy of SW supply to the affected loop header during the specified Completion Time.

B.1

When one required turbine building branch header isolation valve is inoperable, the remaining isolation valve provides assurance that the turbine building branch header will be isolated by a loss of power diesel generator start signal in the absence of a single failure. Without automatic isolation of the turbine building branch header when required, the SW System may not supply adequate flow to safety related systems and isolation of the affected turbine building branch header is required. The Completion Time of 7 days is acceptable based on the low probability of the need for isolation during the period.

An Aalternative action is to change the SW System configuration such that the Turbine Building Branch Header Isolation Valve is no longer required. Specific SW System configurations for the number of required Turbine Building Branch Header Isolation Valves is discussed in the LCO section of the BASES. ~~the number of required turbine building branch header isolation valves by increasing the number of operable SW pumps is acceptable.~~

C.1

(continued)

When one required booster pump suction or strainer backwash header isolation valve is inoperable, the affected flow path may not be isolated upon actuation of the SW System. Without isolation of the flow path, the supply of SW to components performing safety related functions is reduced. A note is added indicating that Separate Entry is

ACTIONS

C.1 (continued)

allowed for each inoperable booster pump suction or strainer backwash header isolation valve. Therefore, all three flow paths could remain available during an accident or transient. The total capacity of the affected flow paths when not isolated by these valves does not exceed the capacity of the turbine building branch header flow path and separate entry is therefore acceptable.

When the affected flow path is isolated, the SW Supply to safety related systems is not reduced. A Completion Time of 7 days to isolate the flow path of each inoperable valve is acceptable based on the low probability of an event during the period. A Note is added to Required Action C.1 indicating that the valve used to isolate the affected flow path may be opened intermittently under administrative controls. These administrative controls consist of a dedicated operator to isolate the flowpath.

D.1

If the SW System configuration is not in accordance with the requirements of SR 3.7.8.1, this indicates that SW flow may not be sufficient to meet design basis assumptions for the given accident scenarios. In this instance, eight hours is provided to review SW System configuration and verify that the SW System is within the flow capabilities of OPERABLE SW pumps, in the absence of a single failure. This also provides time in which to change SW System configuration in order to meet the capabilities of OPERABLE SW pumps.

The SW System configuration that determines adequate flow for the number of OPERABLE SW pumps is as follows:

For 6 OPERABLE SW pumps, there are no limits on SW system lineup.

For 5 OPERABLE SW Pumps, a Turbine Lube Oil Cooler per

(continued)

unit is required to be isolated.

For 4 OPERABLE SW pumps, the following loads are isolated:

a. Once Turbine Lube Oil Cooler per unit,
b. Each of the following Temperature Control Valves OR its associated Bypass Valve is isolated:

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

For 3 OPERABLE SW Pumps the following loads on the SW System are isolated:

a. One Turbine Lube Oil Cooler on the operating unit and two Turbine Lube Oil Conlers on the shutdown unit,
b. All hydrogen coolers on the shutdown unit,
c. Three Reactor Containment Fan Cooler units,
d. One Component Cooling heat exchanger,
e. Each of the following Temperature Control Valves OR its associated bypass valve for each of the following coolers:

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

(continued)

f. Three Stator Water Coolers,
g. One Generator Air Side Seal Oil Cooler,
h. One H2 Seal Oil Cooler, and
i. Four Exciter Coolers.

Two SW pumps, not including SW pump 2SW001-2A, are required to be OPERABLE provided each supply header has at least one OPERABLE SW pump, for the following conditions:

a. Only one unit is in Modes 1, 2, 3, or 4,
b. Two turbine building branch header isolation valves associated with the unit in Mode 1, 2, 3, or 4 are OPERABLE,
c. The Turbine Building Branch Header flow path of the other unit is isolated, and
d. At least three Reactor Containment Fan Coolers and one Component Cooling Heat Exchanger are isolated.

~~If one of the required SW pumps is inoperable, action must be taken to restore the required pump to OPERABLE status within 7 days. In this Condition, the remaining OPERABLE SW pumps are adequate to provide the required flow rate in the absence of a single active failure. The 7 day Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE pump, and the low probability of a DBA occurring during this period.~~

~~The Required Action to restore the required number of SW pumps to OPERABLE status may be satisfied by reducing the SW System loads such that the number of required OPERABLE SW pumps is reduced. In addition, the Required Action to restore the required number of SW pumps to OPERABLE status may be satisfied with three SW pumps all on one supply header, dependent on system configuration. In this situation, a SW System supply header could be without an OPERABLE SW pump, resulting in an inoperable header. This would then require entry into Condition E.~~

Once SW System configuration supports SW operability, it is permissible to remain in this lineup for seven days while restoring SW System configuration to meet the requirements of SR 3.7.8.1. This is consistent with the seven day Required Actions for other inoperable components of the SW System. If the SW System configuration does not support SW operability within 7 days, then the SW System is considered to be operating beyond its design basis, and the provisions

(continued)

of LCO 3.0.3 would apply.

ACTIONS (continued)

E.1

If any of the required SW System supply header cross-tie or loop header isolation valves (listed in Table B 3.7.8-1) are inoperable, or if one of the two SW System supply headers is inoperable (e.g., no associated OPERABLE SW pump, or otherwise incapable of supporting cooling of components), action must be taken to restore the SW System supply header to OPERABLE status. In this condition, the remaining OPERABLE SW System supply header is adequate to perform the heat removal function. The 30 day Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE supply header and the low probability of a DBA occurring during this period.

The inability to open an RCFC loop header isolation or cross-tie valve may not affect the RCFC loop header isolation or cross-tie valves capability to meet the requirements of LCO 3.6.3, "Containment Isolation Valves". However, failure of a RCFC loop header isolation or cross-tie valve to close will result in entry into the applicable conditions and required actions of LCO 3.6.3, "Containment Isolation Valves". The inability to provide service water flow to a RCFC will result in entry into the applicable conditions and required actions of LCO 3.6.6, "Containment Cooling and Reactor Containment Fan Cooler System".

Failure of a Diesel Generator (DG) loop header isolation or cross-tie valve to open or close will not result in the associated DG being inoperable as long as the affected valve is placed in the open position. The inability to provide service water flow to a DG will result in entry into the applicable conditions and required actions of LCO 3.8.1, "AC Sources - Operating".

F.1 and F.2

If the Required Actions and associated Completion Times are not met, or if two or more required SW pumps 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 6 hours and in MODE 5 within 36 hours. The allowed Completion Times are reasonable,

(continued)

BASES

ACTIONS

F.1 and F.2 (continued)

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 3.7.8.1

The purpose of this surveillance is to verify that for a given configuration of OPERABLE SW pumps the correct valve lineup is in place to ensure that the system is within its analyzed flow capabilities. The SW System has been analyzed to show that for various combinations and system lineups, a minimum number of OPERABLE SW pumps are available following a DBA to maintain the minimum required flow of 1500 gpm to the RCFC coolers. The verification of SW pump operability and valve lineup is performed every seven days, which, given the operational control over plant configuration, is adequate to ensure that system configuration and the required number of OPERABLE SW pumps is maintained.

SR 3.7.8.2

This SR verifies proper operation of the SW System automatic valves on an actual or simulated actuation signal (i.e., safety injection, and safe shutdown sequencer by the Loss of Power Diesel Generator Start Instrumentation, LCO 3.3.5). The SW System is a normally operating system that cannot be fully actuated as part of normal testing during unit operation. This surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls.

The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

SR 3.7.8.23

(continued)

BASES

This SR verifies proper automatic operation of the SW pumps on an actual or simulated actuation signal (i.e., safety injection, and safe shutdown sequencer by the Loss of Power Diesel Generator Start Instrumentation, LCO 3.3.5). The SW System is a normally operating system that cannot be fully actuated as part of normal testing during operation. The 18 month Frequency is based on the need to perform this Surveillance under conditions that apply during a unit 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 indicating that the automatic actuation is not required for required opposite unit pumps when the pumps are in operation.

Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

SR 3.7.8.4~~3~~

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

This SR is modified by a Note indicating that CHANNEL CALIBRATION is not required for opposite unit pumps which are in operation.

Operating experience has shown that the components usually pass the Surveillance when performed at the 18 month Frequency. Therefore the Frequency is acceptable from a reliability standpoint.

REFERENCES

1. Zion Station Probabilistic Safety Study, Section II.7, External Events.

2. Sargent and Lundy Calculation ATD-0353, Revision 0, January 28, 1994.

3. Branch Technical Position MEB 3-1, Postulated Rupture Locations in Fluid Systems Piping Inside and Outside

(continued)

BASES

Containment.

4. UFSAR, Section 9.2.1.

5. UFSAR, Section 6.2.

6. UFSAR, Section 5.4.7.

7. Zion Station Updated SW Hydraulic Model Calculation: 22S-B-00220-525, Rev. ~~0~~1.

Table B 3.7.8-1 (Page 1 of 2)

Service Water System Supply Header Cross-tie and Isolation Valves

Valve Descriptions	Valve EPNs	Potential LCO/Conditions
Service Water System Main Supply Header Cross-tie Valves[a]	OMOV-SW0003 OMOV-SW0004	3.7.8 Cond E
Component Cooling Heat Exchanger Loop Header Cross-tie Valves[a]	OMOV-SW0012 OMOV-SW0013 OMOV-SW0014 OMOV-SW0015	3.7.8 Cond E
Unit 1 RCFC Loop Header Cross-tie Valves[a]	1MOV-SW0003 1MOV-SW0004 1MOV-SW0005 1MOV-SW0006	3.7.8 Cond E 3.6.3, 3.6.6
1A, 1B, and 0 DG Loop Header Cross-tie Valves[a]	1MOV-SW0016 1MOV-SW0017 1MOV-SW0018 1MOV-SW0019	3.7.8 Cond E 3.8.1
Unit 2 RCFC Loop Header Cross-tie Valves[a]	2MOV-SW0003 2MOV-SW0004 2MOV-SW0005 2MOV-SW0006	3.7.8 Cond E 3.6.3, 3.6.6
2A and 2B DG Loop Header Cross-tie Valves[a]	2MOV-SW0022 2MOV-SW0023	3.7.8 Cond E 3.8.1
Service Water System Turbine Building Branch Header Isolation Valves[b]	1MOV-SW0100 1MOV-SW0115 2MOV-SW0100 2MOV-SW0115	3.7.8 Cond B
Service Water System Booster Pump Suction and Strainer Backwash Header Isolation Valves[b]	OMOV-SW0005 OMOV-SW0006 OFCV-SW54	3.7.8 Cond C

(a) These valves must be capable of being opened and closed to isolate a passive failure within 3 hours when any of the affected components are required to be OPERABLE. However, when any of the affected components are not required OPERABLE, these valves are only required to be closed or capable of being closed.

(b) These valves are only required to be closed or capable of being closed.

Table B 3.7.8-1 (Page 2 of 2)

Service Water System Supply Header Cross-tie and Isolation Valves

	Valve EPNs	Potential LCO/Conditions
Unit 1 RCFC Loop Header Isolation Valves[a]	1MOV-SW0001 1MOV-SW0002	3.7.8 Cond A 3.7.8 Cond E 3.6.6 3.6.3
1A, 1B, and 0 DG Loop Header Isolation Valves[a]	0MOV-SW0007 0MOV-SW0008	3.7.8 Cond A 3.7.8 Cond E 3.8.1
Unit 2 RCFC Loop Header Isolation Valves[a]	2MOV-SW0001 2MOV-SW0002	3.7.8 Cond A 3.7.8 Cond E 3.6.6 3.6.3
2A and 2B DG Loop Header Isolation Valves[a]	0MOV-SW0009 0MOV-SW0010	3.7.8 Cond A 3.7.8 Cond E 3.8.1

(a) These valves must be capable of being opened and closed to isolate a passive failure within 3 hours when any of the affected components are required to be OPERABLE. However, when any of the affected components are not required OPERABLE, these valves are only required to be closed or capable of being closed.

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LCO
(continued)

g. One Generator Air Side Seal Oil Cooler,
h. One H2 Seal Oil Cooler, and
i. Four Exciter Coolers.

Three SW pumps, not including SW pump 2SW001-2A, are required to be OPERABLE with at least one OPERABLE SW pump in each supply header given the following conditions:

a. Only one unit is in Modes 1, 2, 3, or 4,
b. Two turbine building branch header isolation valves associated with the unit in MODE 1, 2, 3, or 4 are OPERABLE,
c. The turbine building branch header flow path of the other unit is isolated, and
d. At least three Reactor Containment Fan Coolers and one Component Cooling Water Heat Exchanger are isolated.

OPERABILITY of the branch and loop header isolation valves required to automatically align, includes actuation from the loss of power diesel generator start instrumentation. The OPERABILITY of each automatic branch and loop header isolation valve includes the capability to align automatically when required to support its safety injection function when associated with a unit in Modes 1, 2, 3, or 4.

OPERABILITY of the Booster Pump Suction valves and Strainer Backwash Header isolation valve is dependent upon the SW System flow and configuration. The SW Strainer Backwash Header Isolation valve must be OPERABLE unless all six SW pumps are OPERABLE. SW Booster Pump Suction Isolation Valves must be OPERABLE unless at least five SW pumps are OPERABLE.

(continued)

BASES (continued)

APPLICABILITY

In MODES 1, 2, 3, and 4, the SW System is a normally operating system that is required to support the OPERABILITY of the equipment serviced by the SW System and required to be OPERABLE in these MODES.

In MODES 5 and 6, the OPERABILITY requirements of the SW System are determined by the systems and associated heat loads that it supports.

ACTIONS

The ACTIONS are modified by a Note, which ensures appropriate remedial actions are taken, if necessary, if the affected systems are rendered inoperable by an inoperable service water cross-tie or loop header isolation valve.

The number of branch header isolation valves and the number of SW pumps required to be OPERABLE are dependent upon the SW System flow and configuration. (Ref. 7) Therefore, an acceptable alternative to restoration of inoperable equipment may include system reconfiguration and flow reductions.

A.1

Loop header isolation valves must open to ensure adequate cooling of components performing safety related functions in response to conditions requiring actuation of the SW System. When the automatic alignment to the open position of a loop header isolation valve is inoperable, redundancy of the SW supply flow path to the affected safety related system is reduced. In the event of a DBA, the failure of the other isolation valve in the affected loop header to open if closed, could result in the loss of an adequate supply of SW to the affected safety related system unless the valve is open. For these reasons, the affected loop header isolation valve must be open. A Completion Time of 7 days to open the valve is acceptable based on the low probability of a DBA during this period.

Failure of an RCFC loop header isolation valve to open upon receipt of an actual or simulated Engineered Safety Features (ESF) actuation signal will not affect the RCFC loop header isolation valves capability to meet the requirements of LCO 3.6.3, "Containment Isolation Valves". However, failure of a RCFC loop header isolation valve to close will result in entry into the applicable conditions and required actions of

(continued)

BASES

ACTIONS

A.1 (continued)

LCO 3.6.3, "Containment Isolation Valves". The inability to provide service water flow to a RCFC will result in entry into the applicable conditions and required actions of LCO 3.6.6, "Containment Cooling and Reactor Containment Fan Cooler System".

Failure of a Diesel Generator (DG) loop header isolation valve to open upon receipt of an actual or simulated ESF actuation signal will not result in the associated DG being inoperable as long as the affected valve is placed in the open position. The inability to provide service water flow to a DG will result in entry into the applicable conditions and required actions of LCO 3.8.1, "AC Sources - Operating".

A Note is added to Condition A which allows separate condition entry for each loop header. This is acceptable since an inoperable isolation valve in another loop header does not further degrade the redundancy of SW supply to the affected loop header during the specified Completion Time.

B.1

When one required turbine building branch header isolation valve is inoperable, the remaining isolation valve provides assurance that the turbine building branch header will be isolated by a loss of power diesel generator start signal in the absence of a single failure. Without automatic isolation of the turbine building branch header when required, the SW System may not supply adequate flow to safety related systems and isolation of the affected turbine building branch header is required. The Completion Time of 7 days is acceptable based on the low probability of the need for isolation during the period.

An alternative action is to change the SW System configuration such that the Turbine Building Branch Header Isolation Valve is no longer required. Specific SW System configurations for the number of required Turbine Building Branch Header Isolation Valves is discussed in the LCO section of the BASES.

(continued)

BASES

Actions (continued)

C.1

When one required booster pump suction or strainer backwash header isolation valve is inoperable, the affected flow path may not be isolated upon actuation of the SW System. Without isolation of the flow path, the supply of SW to components performing safety related functions is reduced. A note is added indicating that Separate Entry is allowed for each inoperable booster pump suction or strainer backwash header isolation valve. Therefore, all three flow paths could remain available during an accident or transient. The total capacity of the affected flow paths when not isolated by these valves does not exceed the capacity of the turbine building branch header flow path and separate entry is therefore acceptable.

When the affected flow path is isolated, the SW Supply to safety related systems is not reduced. A Completion Time of 7 days to isolate the flow path of each inoperable valve is acceptable based on the low probability of an event during the period. A Note is added to Required Action C.1 indicating that the valve used to isolate the affected flow path may be opened intermittently under administrative controls. These administrative controls consist of a dedicated operator to isolate the flowpath.

D.1

If the SW System configuration is not in accordance with the requirements of SR 3.7.8.1, this indicates that SW flow may not be sufficient to meet design basis assumptions for the given accident scenarios. In this instance, eight hours is provided to review SW System configuration and verify that the SW System is within the flow capabilities of OPERABLE SW pumps, in the absence of a single failure. This also provides time in which to change SW System configuration in order to meet the capabilities of OPERABLE SW pumps.

The SW System configuration that determines adequate flow for the number of OPERABLE SW pumps is as follows:

For 6 OPERABLE SW pumps, there are no limits on SW system lineup.

For 5 OPERABLE SW Pumps, a Turbine Lube Oil Cooler per unit is required to be isolated.

(continued)

BASES

ACTIONS D.1 (contiued)

For 4 OPERABLE SW pumps, the following loads are isolated:

a. One Turbine Lube Oil Cooler per unit,
b. Each of the following Temperature Control Valves OR its associated Bypass Valve is isolated:

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

For 3 OPERABLE SW Pumps the following loads on the SW System are isolated:

a. One Turbine Lube Oil Cooler on the operating unit and two Turbine Lube Oil Coolers on the shutdown unit,
b. All hydrogen coolers on the shutdown unit,
c. Three Reactor Containment Fan Cooler units,
d. One Component Cooling heat exchanger,
e. Each of the following Temperature Control Valves OR its associated bypass valve for each of the following coolers:

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

(continued)

BASES

f. Three Stator Water Coolers,
g. One Generator Air Side Seal Oil Cooler,
h. One H2 Seal Oil Cooler, and
i. Four Exciter Coolers.

Two SW pumps, not including SW pump 2SW001-2A, are required to be OPERABLE provided each supply header has at least one OPERABLE SW pump, for the following conditions:

a. Only one unit is in Modes 1, 2, 3, or 4,
b. Two turbine building branch header isolation valves associated with the unit in Mode 1, 2, 3, or 4 are OPERABLE,
c. The Turbine Building Branch Header flow path of the other unit is isolated, and
d. At least three Reactor Containment Fan Coolers and one Component Cooling Heat Exchanger are isolated.

Once SW System configuration supports SW operability, it is permissible to be in this lineup for seven days while restoring SW System configuration to meet the requirements of SR 3.7.8.1. This is consistent with the seven day Required Actions for other inoperable components of the SW System. If the SW System configuration does not support SW operability within 7 days, then the SW System is operating beyond its design basis, and the provisions of LCO 3.0.3 would apply.

(continued)

ACTIONS (continued)

E.1

If any of the required SW System supply header cross-tie or loop header isolation valves (listed in Table B 3.7.8-1) are inoperable, or if one of the two SW System supply headers is inoperable (e.g., no associated OPERABLE SW pump, or otherwise incapable of supporting cooling of components), action must be taken to restore the SW System supply header to OPERABLE status. In this condition, the remaining OPERABLE SW System supply header is adequate to perform the heat removal function. The 30 day Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE supply header and the low probability of a DBA occurring during this period.

The inability to open an RCFC loop header isolation or cross-tie valve may not affect the RCFC loop header isolation or cross-tie valves capability to meet the requirements of LCO 3.6.3, "Containment Isolation Valves". However, failure of a RCFC loop header isolation or cross-tie valve to close will result in entry into the applicable conditions and required actions of LCO 3.6.3, "Containment Isolation Valves". The inability to provide service water flow to a RCFC will result in entry into the applicable conditions and required actions of LCO 3.6.6, "Containment Cooling and Reactor Containment Fan Cooler System".

Failure of a Diesel Generator (DG) loop header isolation or cross-tie valve to open or close will not result in the associated DG being inoperable as long as the affected valve is placed in the open position. The inability to provide service water flow to a DG will result in entry into the applicable conditions and required actions of LCO 3.8.1, "AC Sources - Operating".

F.1 and F.2

If the Required Actions and associated Completion Times are not met, or if two or more required SW pumps 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 6 hours and in MODE 5 within 36 hours. The allowed Completion Times are reasonable,

(continued)

ACTIONS

F.1 and F.2 (continued)

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 3.7.8.1

The purpose of this surveillance is to verify that for a given configuration of OPERABLE SW pumps the correct valve lineup is in place to ensure that the system is within its analyzed flow capabilities. The SW System has been analyzed to show that for various combinations and system lineups, a minimum number of OPERABLE SW pumps are available following a DBA to maintain the minimum required flow of 1500 gpm to the RCFC coolers. The verification of SW pump operability and valve lineup is performed every seven days, which, given the operational control over plant configuration, is adequate to ensure that system configuration and the required number of OPERABLE SW pumps is maintained.

SR 3.7.8.2

This SR verifies proper operation of the SW System automatic valves on an actual or simulated actuation signal (i.e., safety injection, and safe shutdown sequencer by the Loss of Power Diesel Generator Start Instrumentation, LCO 3.3.5). The SW System is a normally operating system that cannot be fully actuated as part of normal testing during unit operation. This surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls.

The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.8.3

This SR verifies proper automatic operation of the SW pumps on an actual or simulated actuation signal (i.e., safety injection, and safe shutdown sequencer by the Loss of Power Diesel Generator Start Instrumentation, LCO 3.3.5). The SW System is a normally operating system that cannot be fully actuated as part of normal testing during operation. The 18 month Frequency is based on the need to perform this Surveillance under conditions that apply during a unit 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 indicating that the automatic actuation is not required for required opposite unit pumps when the pumps are in operation.

Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

SR 3.7.8.4

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

This SR is modified by a Note indicating that CHANNEL CALIBRATION is not required for opposite unit pumps which are in operation.

Operating experience has shown that the components usually pass the Surveillance when performed at the 18 month Frequency. Therefore the Frequency is acceptable from a reliability standpoint.

REFERENCES

1. Zion Station Probabilistic Safety Study, Section II.7, External Events.

2. Sargent and Lundy Calculation ATD-0353, Revision 0, January 28, 1994.

(continued)

BASES

REFERENCES (continued)

3. Branch Technical Position MEB 3-1, Postulated Rupture Locations in Fluid Systems Piping Inside and Outside Containment.
4. UFSAR, Section 9.2.1.
5. UFSAR, Section 6.2.
6. UFSAR, Section 5.4.7.
7. Zion Station Updated SW Hydraulic Model Calculation: 22S-B-00220-525, Rev. 1.

Table B 3.7.8-1 (Page 1 of 2)

Service Water System Supply Header Cross-tie and Isolation Valves

Valve Descriptions	Valve EPNs	Potential LCO/Conditions
Service Water System Main Supply Header Cross-tie Valves[a]	0MOV-SW0003 0MOV-SW0004	3.7.8 Cond E
Component Cooling Heat Exchanger Loop Header Cross-tie Valves[a]	0MOV-SW0012 0MOV-SW0013 0MOV-SW0014 0MOV-SW0015	3.7.8 Cond E
Unit 1 RCFC Loop Header Cross-tie Valves[a]	1MOV-SW0003 1MOV-SW0004 1MOV-SW0005 1MOV-SW0006	3.7.8 Cond E 3.6.3, 3.6.6
1A, 1B, and 0 DG Loop Header Cross-tie Valves[a]	1MOV-SW0016 1MOV-SW0017 1MOV-SW0018 1MOV-SW0019	3.7.8 Cond E 3.8.1
Unit 2 RCFC Loop Header Cross-tie Valves[a]	2MOV-SW0003 2MOV-SW0004 2MOV-SW0005 2MOV-SW0006	3.7.8 Cond E 3.6.3, 3.6.6
2A and 2B DG Loop Header Cross-tie Valves[a]	2MOV-SW0022 2MOV-SW0023	3.7.8 Cond E 3.8.1
Service Water System Turbine Building Branch Header Isolation Valves[b]	1MOV-SW0100 1MOV-SW0115 2MOV-SW0100 2MOV-SW0115	3.7.8 Cond B
Service Water System Booster Pump Suction and Strainer Backwash Header Isolation Valves[b]	0MOV-SW0005 0MOV-SW0006 0FCV-SW54	3.7.8 Cond C

(a) These valves must be capable of being opened and closed to isolate a passive failure within 3 hours when any of the affected components are required to be OPERABLE. However, when any of the affected components are not required OPERABLE, these valves are only required to be closed or capable of being closed.

(b) These valves are only required to be closed or capable of being closed.

Table B 3.7.8-1 (Page 2 of 2)

Service Water System Supply Header Cross-tie and Isolation Valves

	Valve EPNs	Potential LCO/Conditions
Unit 1 RCFC Loop Header Isolation Valves[a]	1MOV-SW0001 1MOV-SW0002	3.7.8 Cond A 3.7.8 Cond E 3.6.6 3.6.3
1A, 1B, and 0 DG Loop Header Isolation Valves[a]	0MOV-SW0007 0MOV-SW0008	3.7.8 Cond A 3.7.8 Cond E 3.8.1
Unit 2 RCFC Loop Header Isolation Valves[a]	2MOV-SW0001 2MOV-SW0002	3.7.8 Cond A 3.7.8 Cond E 3.6.6 3.6.3
2A and 2B DG Loop Header Isolation Valves[a]	0MOV-SW0009 0MOV-SW0010	3.7.8 Cond A 3.7.8 Cond E 3.8.1

(a) These valves must be capable of being opened and closed to isolate a passive failure within 3 hours when any of the affected components are required to be OPERABLE. However, when any of the affected components are not required OPERABLE, these valves are only required to be closed or capable of being closed.

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3.6 CONTAINMENT SYSTEMS

3.6.6 Containment Spray (CS) and Reactor Containment Fan Cooler (RCFC) Systems

LCO 3.6.6 Three CS trains, two CS recirculation headers and five RCFCs shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CS train inoperable.	A.1	Restore CS train to OPERABLE status.	72 hours AND 14 days from discovery of failure to meet the LCO
B. One CS recirculation header inoperable.	B.1	Restore CS recirculation header to OPERABLE status.	7 days AND 14 days from discovery of failure to meet the LCO
C. One RCFC inoperable.	C.1	Restore RCFC to OPERABLE status.	7 days AND 14 days from discovery of failure to meet the LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A, B or C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours AND 84 hours
E. Two RCFCs inoperable.	E.1 Restore one RCFC to OPERABLE status.	72 hours
F. Required Action and associated Completion Time of Condition E not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.1	Operate each RCFC at low speed for $\geq$ 15 minutes.	31 days
SR 3.6.6.2	Verify the diesel driven CS pump fuel oil day tank contains $\geq$ 46 gallons of fuel oil.	31 days
SR 3.6.6.3	Verify the diesel driven CS pump fuel oil properties are tested in accordance with, and maintained within the limits of the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.6.6.4	Verify each automatic CS valve in the flow path that is not locked, sealed, or otherwise secured in position actuates to the correct position on an actual or simulated actuation signal.	18 months
SR 3.6.6.5	Verify each CS pump starts automatically on an actual or simulated actuation signal.	18 months
SR 3.6.6.6	Verify each RCFC starts automatically on an actual or simulated actuation signal.	18 months

(continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6.7	Verify the Accident Inlet, Accident Outlet, and Normal Inlet RCFC dampers that are not locked, sealed, or otherwise secured in their accident position, are in the accident position.	18 months
SR 3.6.6.8	Verify each spray nozzle is unobstructed.	10 years

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.6.2

Verifying that the diesel driven containment spray pump fuel oil day tank contains greater than or equal to 46 gallons of fuel oil provides assurance that adequate fuel is available to power the diesel driven containment spray pump for the length of time (approximately 77 minutes) it is credited when operating in response to a design basis accident and includes a small margin for calculation conservatism (Ref. 3). The 31 day Frequency is based on the available alarm indication provided in the control room of a low level in the tank.

SR 3.6.6.3

Specification 5.5.11, "Diesel Fuel Oil Testing Program," specifies the required testing of both new fuel oil and stored fuel oil in accordance with the applicable ASTM Standards. Since the diesel driven CS pump fuel oil tank is typically filled from an OPERABLE emergency diesel generator storage tank, the performance of new fuel oil testing is not required. This is because the fuel oil has already been analyzed before being added to the emergency diesel generator storage tanks. However, if fuel oil in an emergency diesel generator storage tank has been determined to not meet the requirements of Specification 3.8.3, "Diesel Fuel Oil and Starting Air," after it has been added to the diesel driven CS pump fuel oil tank, or the fuel oil to be added is from a source other than an OPERABLE emergency diesel generator storage tank, then the new fuel oil must be tested in accordance with the Diesel Fuel Oil Testing Program.

Stored fuel oil degradation shows up as an increase in particulate, due mostly to oxidation. The presence of particulate does not mean the fuel oil will not burn

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.6.3 (continued)

properly in a diesel engine. However, the particulate can cause fouling of filters and fuel oil injection equipment which can cause engine failure.

Stored fuel oil particulate concentrations should be determined in accordance with ASTM D2276, Method A-2 or Method A-3. This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing.

The Frequency of 31 days for testing the stored fuel considers fuel oil degradation trends which indicate that particulate concentration is unlikely to change significantly during this period.

SR 3.6.6.4 and SR 3.6.6.5

These SRs require verification that each automatic CS valve actuates to its correct position and that each CS spray pump starts upon receipt of an actual or simulated actuation of a containment High-High pressure signal coincident with a SI signal. This surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillances were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillances when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.6.6

This SR requires verification that each RCFC actuates upon receipt of an actual or simulated safety injection signal. The 18 month Frequency is based on engineering judgment and on operating experience which has shown that these components usually pass the surveillances when performed at

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.6.6 (continued)

the 18 month frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.6.7

Verifying the correct alignment of the RCFC accident dampers provides assurance that the proper flow path will exist for post accident RCFC operation. This SR does not apply to dampers that are fixed or otherwise secured in position, since these were verified to be in the correct position prior to being secured. This SR does not require any testing or damper manipulation. Rather it involves verification, through a system walkdown, that dampers capable of being mispositioned are in the correct position. The 18 month Frequency is based on the need to access the RCFCs and on operating experience which has shown these that these components usually pass this surveillance when performed at the 18 month Frequency.

SR 3.6.6.8

With the spray header drained of any solution, low pressure air or smoke can be blown through test connections. This SR ensures that each spray nozzle is unobstructed and provides assurance that spray coverage of the containment during an accident is not degraded. Due to the passive design of the nozzle, a test at 10 year intervals is considered adequate to detect obstruction of the nozzles.

REFERENCES

1. UFSAR, Section 6.5.2.
2. UFSAR, Section 6.2.2.
3. UFSAR, Section 15.6.
4. UFSAR, Section 15.0.

3.7 PLANT SYSTEMS

3.7.8 Service Water (SW) System

LCO 3.7.8 The SW System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

------------------------------------NOTE------------------------------------
Enter the applicable Conditions and Required Actions for systems made inoperable by SW System cross-tie and loop header isolation valves.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. --------NOTE-------- Separate Condition entry allowed for each loop header. -------------------- Automatic alignment capability of one required loop header isolation valve inoperable.	A.1 Open the affected valve.	7 days
B. Automatic alignment capability of one required turbine building branch header isolation valve inoperable on one or more turbine building branch header(s).	B.1 Isolate the affected flow path.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. --------NOTE-------- Separate Condition entry allowed for each valve. -------------------- Booster pump suction isolation valve inoperable (if required). <u>OR</u> Strainer backwash header isolation valve inoperable (if required).		---------NOTE-------- Valve may be opened intermittently under administrative controls. ---------------------	
	C.1	Isolate the affected flow path.	7 days
D. SW System configuration not in accordance with requirements of SR 3.7.8.1.	D.1	Verify SW System configuration is within flow capabilities of OPERABLE SW pumps.	8 hours
	<u>AND</u>		
	D.2	Restore SW System configuration in accordance with requirements of SR 3.7.8.1.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. SW System supply header cross-tie or loop header isolation capability inoperable. OR One SW System supply header inoperable.	E.1 Restore SW System to OPERABLE status.	30 days
F. Required Action and associated Completion Time not met. OR Two or more required SW pumps inoperable.	F.1 Be in MODE 3. AND F.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	**Verify SW System configuration.**	**7 days**
SR 3.7.8.2	Verify each required SW System automatic valve in the flow path that is not locked, sealed, or otherwise secured in position actuates to the correct position on an actual or simulated actuation signal.	18 months

	SURVEILLANCE	FREQUENCY
SR 3.7.8.3	-------------------NOTE------------------- Not required when required opposite unit pump is in operation. -- Verify each required SW pump starts automatically on an actual or simulated actuation signal.	13 months
SR 3.7.8.4	-------------------NOTE------------------- Not required when required opposite unit pump is in operation. -- Perform CHANNEL CALIBRATION of required opposite unit Low SW System Supply Header Pressure Channels.	18 months

B 3.7 PLANT SYSTEMS

B 3.7.8 Service Water (SW) System

BASES

BACKGROUND

The SW System is a shared system which provides a heat sink for the removal of process and operating heat from safety related components during a Design Basis Accident (DBA) or transient. During normal operation and shutdown, the SW System also provides this function for various safety related and non-safety related components. The SW System is also the backup safety related water supply to the Auxiliary Feedwater System and the normal supply for the Fire Protection System. The safety related function is covered by this LCO.

Six SW pumps (1SW001-1A, 1SW002-1B, 1SW003-1C, 2SW001-2A, 2SW002-2B, and 2SW003-2C) feed two 100% capacity safety related main supply headers. Each 100% supply header can be cross-tied such that both main supply headers can be supplied by all six SW pumps. Each header is capable of supplying all loads (safety and non-safety related) for either unit. All safety related loads supplied by the SW System are provided with redundant cooling water supplies from loop headers coming from each supply header. Each Safety Related header must be capable of being isolated and aligned to supply required loads in the event of a passive failure. The non-safety related loads are fed from separate branch headers that will be isolated when required from the supply headers under accident conditions.

When the turbine building SW cross connect line is not isolated, a flow path to the turbine building loads of the affected unit is created. This flow path does not automatically isolate upon receipt of a safety injection signal or a loss of power diesel generator start signal. Under this condition, the isolation of the turbine building branch header flow path associated with the affected unit does not isolate the turbine building loads of the affected unit and no significant reduction in the SW System load is accomplished by automatic alignment of the turbine building branch header isolation valves upon SW System actuation on a safety injection or loss of power diesel generator start signal.

The SW pumps, instrumentation, and piping and valves supplying the safety related loads are safety related.

(continued)

BASES

BACKGROUND (continued)

The pumps are automatically started and all safety related valves are aligned to their post accident positions upon receipt of a safety injection signal (from its associated unit). In addition, SW pump auto start signals are initiated by the safe shutdown sequencer on the associated unit and low SW supply header pressure on the opposite unit. Each SW pump has a separate pressure switch with different setpoints so that all pumps do not start at once. The lowest SW pump automatic start setpoint ensures adequate SW supply to safety related components and sufficient pressure in the Service Water System. In the event that offsite power is not available to either unit, the power source for SW pump 2SW001-2A may not be available since the common diesel generator will align to support Unit 1 equipment.

Automatic alignment of the branch header, loop header, booster pump suction, and strainer backwash header isolation valves occurs upon actuation of the SW System for the mitigation of a DBA or transient. These valves are identified in Table B 3.7.8-1, "Service Water System Supply Header Cross-tie and Isolation Valves." Automatic alignment of the loop header isolation valves to the open position ensures a flow path to each of the safety related loads supplied from the loop headers. The branch header, booster pump suction, and strainer backwash header flow paths provide SW to non-safety related loads and automatic alignment to the closed position reduces the demand on the SW System and increases the SW available to the safety related loads.

The Reactor Containment Fan Cooler (RCFC) and Diesel Generator (DG) loop header isolation valves each have the capability to isolate the loop header from one of the two SW System main supply headers. This function is required to ensure the capability to isolate a passive failure in a SW System main supply header. Operation with a DG loop header isolation valve open is acceptable provided the valve can be closed to ensure isolation capability in the event of a passive failure.

When the turbine building service water cross connect line is isolated, automatic alignment of the turbine building branch header isolation valves will result in a complete isolation

(continued)

BASES

BACKGROUND (continued)

of the turbine building loads of the affected unit. With the isolation of the turbine building flow paths, and the isolation of the booster pump suction and strainer backwash header flow paths, the SW System load demand is significantly reduced and the number of SW pumps required to be OPERABLE may potentially be reduced.

The Low SW System Supply Header Pressure auto start ensures each OPERABLE SW pump associated with the supply header of the unit not affected by a postulated Loss of Coolant Accident coincident with a Loss of Offsite Power event will start if not already operating.

Supply header cross-tie and isolation capability is also required to ensure passive failure protection capability in the recirculation phase of a LOCA, assuming no active failure has occurred. This capability is maintained through the OPERABILITY of the cross-tie and isolation valves listed in Table B 3.7.8-1, "Service Water System Supply Header Cross-tie and Isolation Valves." The valves contained within this table isolate the major flowpaths which present the greatest flooding hazard. Manual valves in other SW System supply header flowpaths are not addressed by this LCO since their associated piping diameter is small enough that they do not present a significant flooding hazard in the event of a passive failure.

The SW System supply headers may have the main and loop cross-tie and the loop header isolation valves opened or closed in support of passive failure protection. The main and loop cross-tie and the loop header isolation valves must be capable of being both opened and closed in order to isolate the affected flowpath and provide cooling water to the minimum required safety related components when the components supplied from the flow path are required to be OPERABLE. However, when the equipment within a flow path is not required to be OPERABLE, the main and loop cross-tie and the loop header isolation valves may be either closed or capable of being closed. The turbine building branch header, booster pump suction and strainer backwash header isolation valves are only required to be closed or capable of being closed since their intended safety function is to provide the capability to isolate a non-safety related portion of the SW System.

(continued)

BASES

BACKGROUND (continued)	The capability to open and close the SW System main and loop cross-tie and the loop header isolation valves is predicated on the need to mitigate the consequences of a passive failure in the SW System. A passive failure of the SW System poses a potential flooding hazard for safety related components. The limiting coping time for this event is bounded by a passive failure of the SW System piping in the auxiliary building. In this event, floodwater would flow through floor drains and stairwells down to the 542 ft elevation. At this elevation, approximately 498,000 gallons of water could be held without affecting the RHR pump motors that are mounted up from the floor (Ref. 1). The maximum leakage rate assumed for a passive failure in the SW System is approximately 2400 gpm (Refs. 2 and 3). Thus, a coping time of approximately 3 1/2 hours is provided before flooding of the RHR pump motors occurs. To preclude the flooding of safety related components in the event of a passive failure in the SW supply piping and to provide an additional measure of conservatism, the capability must exist to position the required valves listed in Table B 3.7.8-1 within 3 hours. It should be noted however, that it is acceptable to administratively remove the valves listed in Table B 3.7.8-1 from service, or to have only manual positioning capability (without the use of a motor operator) provided all the required valves can be positioned within 3 hours. Additional information about the design and operation of the SW System, along with a list of the components served, is presented in the UFSAR, Section 9.2.1 (Ref. 4).
APPLICABLE SAFETY ANALYSIS	The design basis of the SW System is to provide cooling for all essential loads. The design basis for the SW System, in conjunction with the CC System is to remove core decay heat following a design basis loss of coolant accident (LOCA) as discussed in the UFSAR, Section 6.2 (Ref. 5). This prevents the containment recirculation sump fluid from increasing in temperature during the recirculation phase following a LOCA and provides for a gradual reduction in the temperature of this fluid as it is supplied to the Reactor Coolant System by the Emergency Core Cooling System (ECCS) pumps.

(continued)

BASES

APPLICABLE SAFETY ANALYSIS (continued)

The SW System, in conjunction with the CC System, also cools the unit from residual heat removal (RHR) entry conditions (Ref. 6) to MODE 5 during normal and post accident operations. The time required for this evolution is a function of the decay heat load, and the number of CC and RHR System trains that are operating.

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

LCO

An OPERABLE SW System provides the required redundancy to ensure that the SW System safety functions can be accomplished assuming either; 1) loss of the onsite electric power system (diesel generators) assuming offsite power is available, or 2) loss of the offsite electric power system assuming onsite power (diesel generators) is available, coincident with a single failure (a passive failure is only assumed during the recirculation phase following a LOCA).

The SW System consists of two main supply headers and is operated as a shared system that provides cooling to equipment on both units. Passive failure of supply header piping or components requires the capability to isolate each supply header. This capability is maintained through the OPERABILITY of the cross-tie and isolation valves listed in Table B 3.7.8-1, "Service Water System Supply Header Cross-tie and Isolation Valves."

The SW System is OPERABLE when two supply headers are OPERABLE. A supply header must have at least one OPERABLE SW pump to be considered OPERABLE. OPERABILITY of the SW System also requires instrumentation and controls associated with pumps and valves that are required to automatically start and align upon actuation to be OPERABLE.

OPERABILITY of each turbine building branch header isolation valve includes the capability to automatically close upon actuation of the Loss of Power Diesel Generator Start Instrumentation.

The OPERABILITY of each turbine building branch header isolation valve associated with a unit in Modes 1, 2, 3, or 4 also includes the capability to close automatically upon safety injection.

(continued)

BASES

LCO
(continued)

The number of branch header isolation valves required to be OPERABLE is dependent upon the SW System flow and configuration. (Ref. 7)

Two Turbine Building Branch Header Isolation Valves per turbine building branch header (four total) are required OPERABLE, unless one of the configurations listed below is satisfied.

A Turbine Building Branch Header Isolation Valve is not required under specific SW System configurations. SW System configuration is independent of the Mode of either unit, except in specific circumstances, discussed in the BASES (NOTE: In the event that offsite power is not available to either unit, the power source for SW pump 2SW001-2A may not be available since the common diesel generator will align to support Unit 1 Equipment). The SW System configurations for the number of turbine building branch header isolation valves required are as follows:

Two turbine building branch header isolation valves associated with the unit in Mode 1, 2, 3, or 4 are required when:

1. Only one unit is in Mode 1, 2, 3, or 4,
2. The turbine building branch header flow path of the other unit is isolated,
3. At least three Reactor Containment Fan Coolers and one Component Cooling Water Heat Exchanger are isolated, and
4. At least three SW pumps, not including SW pump 2SW001-2A, are OPERABLE.

No turbine building branch header isolation valves are required when:

1. At least five SW pumps, not including SW pump 2SW001-2A, are OPERABLE;
2. The following loads on the SW System are isolated:
    a. One Turbine Lube Oil Cooler per unit,
    b. Each of the following Temperature Control Valves OR its associated bypass valve:

(continued)

BASES

LCO
(continued)

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

No turbine building branch header isolation valves are required to be OPERABLE when:

1. At least four SW pumps, not including SW pump 2SW001-2A, are OPERABLE,
2. The following loads on the SW System are isolated:
   a. One Turbine Lube Oil Cooler on the operating unit and two Turbine Lube Oil Coolers on the shutdown unit,
   b. All hydrogen coolers on the shutdown unit,
   c. Three Reactor Containment Fan Cooler units,
   d. One Component Cooling heat exchanger,
   e. Each of the following Temperature Control Valves OR its associated bypass valve:

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

LCO

   f. Three Stator Water Coolers (One on the

(continued)

BASES

LCO (continued)

f. Three Stator Water Coolers (One on the operating unit, two on the shutdown unit),
g. One Generator Air Side Seal Oil Cooler,
h. One H2 Seal Oil Cooler, and
i. Four Exciter Coolers.

Operability of each required opposite unit SW pump includes the capability to start automatically upon actuation of the low supply header pressure switch. This capability requires that the diesel generator associated with each OPERABLE SW pump is OPERABLE. Operability of each SW pump requires the associated supply header is OPERABLE.

The OPERABILITY of each SW pump associated with a unit in Modes 1, 2, 3, or 4 also includes the capability to start automatically when required to support the safety injection function.

The number of SW pumps required to be OPERABLE is dependent upon the number of SW pumps required to automatically start and operate in response to accident or transient conditions, and which SW pumps are OPERABLE. The required SW System configuration and number of OPERABLE pumps is independent of the Mode of either unit (NOTE: The appropriate Mode for either unit may be constrained by the required SW System configuration and number of OPERABLE SW pumps).

The number of SW pumps required to be OPERABLE is dependent upon the SW System flow and configuration. (Ref. 7)

The number of SW pumps required to be OPERABLE is six provided that one Main Turbine Lube Oil Cooler per unit is isolated. For less than six OPERABLE SW Pumps, specific SW System configurations must be met. These SW System configurations and the minimum number of SW pumps required to be OPERABLE when in this configuration, are as follows:

Five service water pumps are required to be OPERABLE given the following:

a. One Turbine Lube Oil Cooler isolated per unit,
b. Each of the following Temperature Control Valves OR its associated bypass valve is isolated:

(continued)

BASES

LCO
(continued)

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

Four service water pumps are required to be OPERABLE given the following conditions:

1. The following loads on the SW System are isolated:
   a. One Turbine Lube Oil Cooler on the operating unit and two Turbine Lube Oil Coolers on the shutdown unit,
   b. All hydrogen coolers on the shutdown unit,
   c. Three Reactor Containment Fan Cooler units,
   d. One Component Cooling heat exchanger,
   e. Each of the following Temperature Control Valves OR its associated bypass valve for the operating unit for each of the following coolers:

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

   f. Three Stator Water Coolers,

LCO

(continued)

NUREG MARKUPS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.6~~A.2~~ 1	Operate each ~~[required]~~ ~~containment cooling train fan unit~~ RCFC at low speed for ≥ 15 minutes.	31 days
SR 3.6.6~~A.3~~ 2	Verify each ~~[required]~~ ~~containment cooling train~~ RCFC cooling water flow rate is ≥ ~~[700]~~ 1600 gpm.	31 days
SR 3.6.6~~A.4~~ 3	Verify each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.6.6~~A.5~~ 4	Verify each automatic ~~containment spray~~ valve in the flow path that is not locked, sealed, or otherwise secured in position actuates to the correct position on an actual or simulated actuation signal.	~~[18]~~ months
SR 3.6.6~~A.6~~ 5	Verify each ~~containment spray~~ pump starts automatically on an actual or simulated actuation signal.	[18] months
SR 3.6.6~~A.7~~ 6	Verify each ~~[required]~~ ~~containment cooling train~~ RCFC starts automatically on an actual or simulated actuation signal.	[18] months

22 2

7

INSERT "B"

NRC-03 -09, R1

(continued)

9

INSERT "C"

3.6.6 LCO

8

INSERT "A"

B. One CS recirculation header inoperable.	B.1 Restore CS recirculation header to OPERABLE status.	7 days AND 14 days from discovery of failure to meet the LCO

9

INSERT "B"

SR 3.6.6.~~2~~ ~~3~~ 2 Verify the diesel driven CS pump fuel oil day tank contains ≥ 46 gallons of fuel oil.	31 days
SR 3.6.6.~~3~~ ~~4~~ 3 Verify the diesel driven CS pump fuel oil properties are tested in accordance with, and maintained within the limits of the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program

9

INSERT "C"

SR 3.6.6.~~8~~ ~~8~~ ~~8~~ 7 ~~Verify each RCFC damper is in the accident position.~~ Verify the Accident Inlet, Accident Outlet, and Normal Inlet RCFC dampers that are not locked, sealed, or otherwise secured in their accident position, are in the accident position.	18 months

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.6.6.8 Verify each spray nozzle is unobstructed.	[At first refueling AND] 10 years

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.6A.~~2~~ 1

RCFC at low speed

Operating each ~~[required]~~ ~~containment cooling train fan unit~~ for ≥ 15 minutes ensures that all ~~trains~~ fans unit 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 considering the known reliability of the fan units and controls, the ~~two train~~ redundancy available, and the low probability of significant degradation of the ~~containment cooling train~~ RCFC occurring between surveillances. It has also been shown to be acceptable through operating experience.

22

SR 3.6.6A.~~3~~ 2

the RCFC

Verifying ~~that each [required]~~ ~~containment cooling train~~ ESW cooling flow rate to each ~~cooling~~ unit is ≥ ~~[700]~~ 1600 gpm provides assurance that the design flow rate assumed in the safety analyses will be achieved (Ref. 3). The Frequency was developed considering the known reliability of the Cooling Water System, the ~~two train~~ redundancy available, and the low probability of a significant degradation of flow occurring between surveillances.

9

INSERT "5" →

SR 3.6.6A.~~4~~ 3

Verifying each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head ensures that spray pump performance has not degraded during the cycle. Flow and differential pressure are normal tests of centrifugal pump performance required by Section XI of the ASME Code (Ref. 8). Since the containment spray pumps cannot be tested with flow through the spray headers, they are tested on recirculation flow. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by abnormal performance. The Frequency of the SR is in accordance with the Inservice Testing Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

NRC-02 C9, R1

This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls

SR 3.6.6~~A.5~~4 and SR 3.6.6~~A.6~~5

Coincident with a SI signal

These SRs require verification that each automatic ~~containment spray~~ valve actuates to its correct position and that each ~~containment spray~~ pump starts upon receipt of an actual or simulated actuation of a containment High-~~3~~ High pressure signal. The ~~[18]~~ month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillances were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillances when performed at the ~~[18]~~ month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

X-Ref Not Reqr'D

The surveillance of containment sump isolation valves is also required by SR 3.5.2.5. A single surveillance may be used to satisfy both requirements.

SR 3.6.6~~A.7~~6

This SR requires verification that each ~~[required]~~ RCFC ~~containment cooling train~~ actuates upon receipt of an actual or simulated safety injection signal. The ~~[18]~~ month Frequency is based on engineering judgment and ~~has been shown to be acceptable through operating experience. See SR 3.6.6A.5~~4 ~~and SR 3.6.6A.6~~5~~, above, for further discussion of the basis for the [18] month Frequency~~. Operating experience which has shown that these components usually pass the Surveillance when performed at the 18 month frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint

9

INSERT "H"

SR 3.6.6~~A.8~~ ~~9~~ 4

Plant Design Inlet valve Not Required to be closed for the SR

With ~~the containment spray inlet valves closed and~~ the spray header drained of any solution, low pressure air or smoke can be blown through test connections. This SR ensures that each spray nozzle is unobstructed and provides assurance that spray coverage of the containment during an accident is not degraded. Due to the passive design of the nozzle, a test at ~~[the first refueling and at]~~ 10 year intervals is considered adequate to detect obstruction of the nozzles.

(continued)

8

3.6.6 BASES cont'

INSERT "E"

Containment spray during the recirculation phase is accomplished by aligning an RHR pump to the spray header of one motor driven CS pump. Two spray headers are required to remain OPERABLE to assure the system capability to provide containment spray during the recirculation phase following a DBA. Two headers are required to ensure that one header will be available after a postulated single failure. An OPERABLE header includes the piping from the RHR System to the inlet of the spray header and to the spray nozzles. In addition, the necessary valves and other controls to assure the capability to align the RHR System to the recirculation mode and provide the design spray flow to the containment atmosphere are required. The plant design includes two recirculation headers, as such, both headers are required to remain OPERABLE during operations in the applicable MODES.

INSERT "F"

B.1 8

With one CS recirculation header inoperable, the inoperable CS header must be restored to OPERABLE status within 7 days. In this Condition, the remaining OPERABLE CS recirculation header performs the containment cooling function. The 7 day Completion Time takes into account the redundant heat removal capability afforded by the RCFCs, reasonable time for repairs, and low probability of a DBA occurring during this period.

The 14 day portion of the Completion Time for Required Action B.1 is based upon engineering judgment. It takes into account the low probability of coincident entry into two Conditions in this Specification coupled with the low probability of an accident occurring during this time.

9

INSERT "G"

SR 3.6.6.~~4~~ ~~3~~ 2

Verifying that the diesel driven containment spray pump fuel oil day tank contains greater than or equal to 46 gallons of fuel oil provides assurance that adequate fuel is available to power the diesel driven containment spray pump for the length of time (approximately 77 minutes) it is credited when operating in response to a design basis accident and includes a small margin for calculation conservatism (Ref. 3). The 31 day Frequency is based on the available alarm indication provided in the control room of a low level in the tank.

19

3.6.6 BASES cont'

INSERT "G" cont'

SR 3.6.6.~~5~~4

Specification 5.5.11, "Diesel Fuel Oil Testing Program," specifies the required testing of both new fuel oil and stored fuel oil in accordance with the applicable ASTM Standards. Since the diesel driven CS pump fuel oil tank is typically filled from an OPERABLE emergency diesel generator storage tank, the performance of new fuel oil testing is not required. This is because the fuel oil has already been analyzed before being added to the emergency diesel generator storage tanks. However, if fuel oil in an emergency diesel generator storage tank has been determined not to meet the requirements of LCO 3.8.3, "Diesel Fuel Oil and Starting Air," after it has been added to the diesel driven CS pump fuel oil tank, or the fuel oil to be added is from a source other than an OPERABLE emergency diesel generator storage tank, then the new fuel oil must be tested in accordance with the Diesel Fuel Oil Testing Program.

Stored fuel oil degradation shows up as an increase in particulate, due mostly to oxidation. The presence of particulate does not mean the fuel oil will not burn properly in a diesel engine. However, the particulate can cause fouling of filters and fuel oil injection equipment which can cause engine failure.

Stored fuel oil particulate concentrations should be determined in accordance with ASTM D2276, Method A-2 or Method A-3. This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing.

The Frequency of 31 days for testing the stored fuel considers fuel oil degradation trends which indicate that particulate concentration is unlikely to change significantly during this period.

19

SR 3.6.6.~~8~~

INSERT "H"

Verifying the correct alignment of the RCFC accident dampers provides assurance that the proper flow path will exist for post accident RCFC operation. This SR does not apply to dampers that are fixed or otherwise secured in position, since these were verified to be in the correct position prior to being secured. This SR does not require any testing or damper manipulation. Rather it involves verification, through a system walkdown, that dampers capable of being mispositioned are in the correct position. The 18 month Frequency is based on the need to access the RCFCs and on operating experience which has shown these that these components usually pass this surveillance when performed at the 18 month Frequency.

CTS 3.8.7

3.7 PLANT SYSTEMS

3.7.8 Service Water System (SW~~S~~)

12

PS design not "trains"

LCO 3.7.8 ~~Two~~ the SW~~S~~ ~~trains~~ System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

30

— NOTE —
Enter Applicable Conditions and Required Actions for systems made inoperable by SW System cross-tie and loop header isolation valves.

ACTIONS

CTS CT design

Δ WOG-12 C1

12

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A.~~ D. One required SW~~S~~ ~~train~~ pump inoperable. New Conditions; (See Insert 3.7.8-1) A — Auto Alignment of Loop Hdr vlvs — 30 B — Auto Alignment of Turb Bld Valves — 31 C — Booster pump or Strainer valve inop — 32	~~A~~.1 D. Restore required SW~~S~~ ~~train~~ pump to OPERABLE status. ---------NOTES-------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources—Operating," for emergency diesel generators made inoperable by SWS. 2. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops—MODE 4," for residual heat removal loops made inoperable by SWS. ------------------------	7 days ~~72 hours~~ e
new 12 E. SW System supply or loop header header cross-tie isolation capability inoperable, OR One SW System main supply header inoperable	E.1 Restore SW System to OPERABLE status.	30 days

(continued)

New insert 3.7.8-2

34

INSERT 3.7.8-1

A. --------NOTE-------- Separate Condition entry allowed for each loop header. -------------------- Automatic alignment capability of one required loop header isolation valve inoperable.	A.1 Open the affected valve.	7 days
B. Automatic alignment capability of one required turbine building branch header ~~supply~~ isolation valve inoperable on one or more turbine building branch header(s).	B.1 Isolate the affected flow path.	7 days
C. --------NOTE-------- Separate Condition entry allowed for each valve. -------------------- (34) ~~Required~~ booster pump suction ~~stop~~ isolation valve inoperable (if required). OR (34) ~~Required~~ strainer backwash header isolation valve inoperable (if required)	----------NOTE--------- Valve may be opened intermittently under administrative controls. ----------------------- C.1 Isolate the affected flow path.	7 days

INSERT 3.7.8-2

D. SW System configuration not in accordance with requirements of SR 3.7.8.1.	D.1 Verify SW System configuration is within flow capabilities of OPERABLE SW pumps.	8 hours
	AND	
	D.2.2 Restore SW System configuration in accordance with requirements of SR 3.7.8.1.	7 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
F ~~B~~. Required Action and associated Completion Time ~~of Condition A~~ e not met. or two or more required SW pumps inoperable.	F ~~B~~.1	Be in MODE 3.	6 hours
	AND		
	F ~~B~~.2	Be in MODE 5.	36 hours

WG
CTS

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	-------------------NOTE------------------- Isolation of SWS flow to individual components does not render the SWS inoperable. -- Verify each SWS manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.7.8.2	Verify each required ~~SWS~~ system automatic valve in the flow path that is not locked, sealed, or otherwise secured in position actuates to the correct position on an actual or simulated actuation signal.	~~[~~18~~]~~ months
SR 3.7.8.3	Verify each ~~SWS~~ SW pump starts automatically on an actual or simulated actuation signal.	~~[~~18~~]~~ months

27

Insert 3.7.8-3
3.7-20 35

NRC-03
C9, R2

SR 3.7.8.3 Perform CHANNEL CALIBRATION of Required Opposite unit Low SW System Supply header pressure channels. 18 Months

33

NOTE
Not Required when required Opposite unit pumps are in operation

INSERT 3.7.8-3

SR 3.7.8.1 Verify SW System configuration.	7 days

B 3.7 PLANT SYSTEMS

SWS = SW System

B 3.7.8 Service Water System (SW~~S~~) System

BASES

BACKGROUND

System is a shared system which

The SWS provides a heat sink for the removal of process and operating heat from safety related components during a Design Basis Accident (DBA) or transient. During normal operation, and a normal shutdown, the SWS also provides this function for various safety related and nonsafety related components. The safety related function is covered by this LCO.

The SW System is also the backup safety related water supply to the Auxiliary Feedwater System, and the normal supply to the Fire Protection System

INSERT B41A

The SWS consists of two ~~separate,~~ 100% capacity, safety related, cooling water trains. Each train consists of two 100% capacity pumps, one component cooling water (CCW) heat exchanger, piping, valving, instrumentation, and two cyclone separators. The pumps and valves are remote and manually aligned, except in the unlikely event of a loss of coolant accident (LOCA). The pumps aligned to the critical loops are automatically started upon receipt of a safety injection signal, and all essential valves are aligned to their post accident positions. The SWS also provides emergency makeup to the spent fuel pool and CCW System [and is the backup water supply to the Auxiliary Feedwater System].

Not in DBD

Additional information about the design and operation of the SWS, along with a list of the components served, is presented in the FSAR, Section [9.2.1] (Ref. 1). ~~The principal safety related function of the SWS is the removal of decay heat from the reactor via the CCW System.~~

APPLICABLE SAFETY ANALYSES

Not designed in "trains"

The design basis of the SWS is ~~for one SWS train,~~ to provide cooling for all essential loads in conjunction with the CCW System ~~and a 100% capacity containment cooling system,~~ to remove core decay heat following a design basis LOCA as discussed in the FSAR, Section [6.2] (Ref. 2). This prevents the containment sump fluid from increasing in temperature during the recirculation phase following a LOCA and provides for a gradual reduction in the temperature of this fluid as it is supplied to the Reactor Coolant System by the ECCS pumps. The SWS is designed to perform its function with a single failure of any active component, assuming the loss of offsite power.

the design basis for the SW System

recirculation

Emergency Core Cooling System

(continued)

INSERT B41A (continued)

safety related loads supplied from the loop headers. The branch header, booster pump suction, and strainer backwash header flow paths provide SW to non-safety related loads and automatic alignment to the closed position reduces the demand on the SW System and increases the SW available to the safety related systems.

The Reactor Containment Fan Cooler (RCFC) and Diesel Generator (DG) loop header isolation valves each have the capability to isolate the loop header from one of the two SW System main supply headers. This function is required to ensure the capability to isolate a passive failure in a SW System main supply header. Operation with a DG loop header isolation valve open is acceptable provided the valve can be closed to ensure isolation capability in the event of a passive failure.

When the turbine building service water cross connect line is isolated, automatic alignment of the turbine building supply isolation valves will result in a complete isolation of the turbine building loads of the affected unit. With the isolation of the turbine building flow paths, and the isolation of the booster pump suction and strainer backwash header flow paths, the SW System load demand is significantly reduced and the number of SW pumps required to be OPERABLE may potentially be reduced.

The Low SW System Supply Header Pressure auto start ensures each OPERABLE SW pump associated with the supply header of the unit not affected by a postulated Loss of Coolant Accident coincident with a Loss of Offsite Power event will start if not already operating.

Supply header cross-tie and isolation capability is also required to ensure passive failure protection capability in the recirculation phase of a LOCA, assuming no active failure has occurred. This capability is maintained through the OPERABILITY of the cross-tie and isolation valves listed in Table B 3.7.8-1, "Service Water System Supply Header Cross-tie and Isolation Valves." The valves contained within this table isolate the major flowpaths which present the greatest flooding hazard. Manual valves in other SW System supply header flowpaths are not addressed by this LCO since their associated piping diameter is small enough that they do not present a significant flooding hazard in the event of a passive failure.

INSERT B41A (continued)

INSERT B41A (continued)

The SW System supply headers may have the main and loop cross-tie and the loop header isolation valves opened or closed in support of passive failure protection. The main and loop cross-tie and the loop header isolation valves must be capable of being both opened and closed in order to isolate the affected flowpath and provide cooling water to the minimum required safety related components when the components supplied from the flow path are required to be OPERABLE. However, when the equipment within a flow path is not required to be OPERABLE, the main and loop cross-tie and header isolation valves may be either closed or capable of being closed. The turbine building branch header, booster pump suction and strainer backwash header isolation valves are only required to be closed or capable of being closed since their intended safety function is to provide the capability to isolate a non-safety related portion of the SW Syste

The capability to open and close the SW System main and loop cross-tie and the loop header isolation valves is predicated on the need to mitigate the consequences of a passive failure in the SW System. A passive failure of the SW System poses a potential flooding hazard for safety related components. The limiting coping time for this event is bounded by a passive failure of the SW System piping in the auxiliary building. In this event, floodwater would flow through floor drains and stairwells down to the 542 ft elevation. At this elevation, approximately 498,000 gallons of water could be held without affecting the RHR pump motors that are mounted up from the floor (Ref. 1). The maximum leakage rate assumed for a passive failure in the SW System is approximately 2400 gpm (Refs. 2 and 3). Thus, a coping time of approximately 3 1/2 hours is provided before flooding of the RHR pump motors occurs. To preclude the flooding of safety related components in the event of a passive failure in the SW supply piping and to provide an additional measure of conservatism, the capability must exist to position the required valves listed in Table B 3.7.8-1 within 3 hours. It should be noted however, that it is acceptable to administratively remove the valves listed in Table B 3.7.8-1 from service, or to have only manual positioning capability (without the use of a motor operator) provided all the required valves can be positioned within 3 hours.

BASES

decay heat load, and the

APPLICABLE SAFETY ANALYSES (continued)

System

The ~~SWS~~, in conjunction with the CC~~W~~ System, also cools the unit from residual heat removal (RHR), ~~as discussed in the UFSAR, Section [5.4.7]~~, (Ref. ~~3~~ 6), entry conditions to MODE 5 during normal and post accident operations. The time required for this evolution is a function of the number of CC~~W~~ and RHR System trains that are operating. One SWS train ~~is sufficient to remove decay heat during subsequent operations in MODES 5 and 6. This assumes a maximum SWS temperature of [95]°F occurring simultaneously with maximum heat loads on the system.~~

MODE 5/6 NA to this LCO

The SWS satisfies Criterion 3 of the NRC Policy Statement.

LCO

design

~~Two SWS trains are required to be OPERABLE to provide the required redundancy to ensure that the system functions to remove post accident heat loads, assuming that the worst case single active failure occurs coincident with the loss of offsite power.~~

INSERT B42A

~~An SWS train is considered OPERABLE during MODES 1, 2, 3, and 4 when:~~

~~a. The pump is OPERABLE; and~~

& Address NOTE

~~b. The associated piping, valves, heat exchanger, and instrumentation and controls required to perform the safety related function are OPERABLE.~~

APPLICABILITY

System

In MODES 1, 2, 3, and 4, the ~~SWS~~ is a normally operating system that is required to support the OPERABILITY of the equipment serviced by the ~~SWS~~ and required to be OPERABLE in these MODES.

system

In MODES 5 and 6, the OPERABILITY requirements of the SWS are determined by the systems it supports and associated heat loads.

delete New insert B42B

ACTIONS

D ~~A~~.1

system required pumps

If one ~~SWS~~ ~~train~~ is inoperable, action must be taken to restore the required pump to OPERABLE status within 7 ~~2 hours~~ days. In this Condition,

Insert New Action A, B & C
Insert B 42 B

20
21
22

(continued)

INSERT B42A

An OPERABLE SW System provides the required redundancy to ensure that the SW System safety functions can be accomplished assuming either; 1) loss of the onsite electric power system (diesel generators) assuming offsite power is available, or 2) loss of the offsite electric power system assuming onsite power (diesel generators) is available, coincident with a single failure (a passive failure is only assumed during the recirculation phase following a LOCA).

The SW System consists of two main supply headers and is operated as a shared system that provides cooling to equipment on both units. Passive failure of supply header piping or components requires the capability to isolate each supply header. This capability is maintained through the OPERABILITY of the cross-tie and isolation valves listed in Table B 3.7.8-1, "Service Water System Supply Header Cross-tie and Isolation Valves."

The SW System is OPERABLE when two supply headers are OPERABLE. A supply header must have at least one OPERABLE SW pump to be considered OPERABLE. OPERABILITY of the SW System also requires instrumentation and controls associated with pumps and valves that are required to automatically start and align upon actuation to be OPERABLE.

OPERABILITY of each turbine building branch header isolation valve includes the capability to automatically close upon actuation of the Loss of Power Diesel Generator Start Instrumentation. The OPERABILITY of each turbine building supply isolation valve associated with a unit in Modes 1, 2, 3, or 4 also includes the capability to close automatically upon safety injection.

The number of branch header isolation valves required to be OPERABLE is dependent upon the SW System flow and configuration. (Ref. 7)

Two Turbine Building Branch Header Isolation Valves per turbine building branch header (four total) are required OPERABLE, unless one of the configurations listed below is satisfied.

A Turbine Building Branch Header Isolation Valve is not required under specific SW System configurations. SW System configuration is independent of the Mode of either unit, except in specific circumstnaces, discussed in the BASES (NOTE: In the event offsite power is not available to either unit, the power source for the SW pump 2SW001-2A may not be available since the common diesel generator will align to support Unit 1 equipment). The SW System configurations for the number of turbine building branch header isolation valves required are as follows:

INSERT B42A
(continued

Two turbine building branch header isolation valves associated with the unit in Mode 1, 2, 3, or 4 are required when:

1. Only one unit is in Mode 1, 2, 3, or 4,
2. The turbine building branch header flow path of the other unit is isolated,
3. At least three Reactor Containment Fan Coolers and one Component Cooling Water Heat Exchanger are isolated, and
4. At least three SW pumps, not including SW pump 2SW001-2A, are OPERABLE.

No turbine building branch header isolation valves are required when:

1. At least five SW pumps, not including SW pump 2SW001-2A, are OPERABLE;
2. The following loads on the SW System are isolated:
   a. One Turbine Lube Oil Cooler per unit,
   b. Each of the following Temperature Control Valves OR its associated bypass valve:

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

No turbine building branch header isolation valves are required to be OPERABLE when:

1. At least four SW pumps, not including SW pump 2SW001-2A, are OPERABLE,

INSERT B42A
(continued)

2. The following loads on the SW System are isolated:
   a. One Turbine Lube Oil Cooler on the operating unit and two Turbine Lube Oil Coolers on the shutdown unit,
   b. All hydrogen coolers on the shutdown unit,
   c. Three Reactor Containment Fan Cooler units,
   d. One Component Cooling heat exchanger,
   e. Each of the following Temperature Control Valves OR its associated bypass valve:

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

   f. Three Stator Water Coolers (One on the operating unit, two on the shutdown unit),
   g. One Generator Air Side Seal Oil Cooler,
   h One H2 Seal Oil Cooler, and
   i. Four Exciter Coolers.

Operability of each required opposite unit SW pump includes the capability to start automatically upon actuation of the low supply header pressure switch. This capability requires that the diesel generator associated with each OPERABLE SW pump is OPERABLE. Operability of each SW pump requires the associated supply header is OPERABLE.

The OPERABILITY of each SW pump associated with a unit in Modes 1, 2, 3, or 4 also includes the capability to start automatically when required to support the safety injection function.

INSERT B42A
(continued)

The number of SW pumps required to be OPERABLE is dependent upon the number of SW pumps required to automatically start and operate in response to accident or transient conditions, which SW pumps are OPERABLE and the operating mode of both units. The required SW System configuration and number of OPERABLE pumps is independent of the Mode of either unit (NOTE: The appropriate Mode for either unit may be constrained by the required SW System configuration and number of OPERABLE SW Pumps.

The number SW pumps required to be OPERABLE is dependent upon the SW System flow and configuration. (Ref. 7)

INSERT B42A
(continued)

The number of SW pumps required to be OPERABLE is six provided that one Main Turbine Lube Oil Cooler per unit is isolated. For less than six OPERABLE SW Pumps, specific SW System configurations must be met. These SW System configurations and the minimum number of SW pumps required to be OPERABLE when in this configuration, are as follows:

Five service water pumps are required to be OPERABLE given the following:

a. One Turbine Lube Oil Cooler isolated per unit,
b. Each of the following Temperature Control Valves OR its associated bypass valve is isolated:

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

Four service water pumps are required to be OPERABLE given the following conditions:

1. The following loads on the SW System are isolated:
   a. One Turbine Lube Oil Cooler on the operating unit and two Turbine Lube Oil Coolers on the shutdown unit,
   b. All hydrogen coolers on the shutdown unit,
   c. Three Reactor Containment Fan Cooler units,
   d. One Component Cooling heat exchanger,
   e. Each of the following Temperature Control Valves OR its associated bypass valve for the operating unit for each of the following coolers:

ISNERT B42A
(continued)

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

f. Three Stator Water Coolers,
g. One Generator Air Side Seal Oil Cooler,
h. One H2 Seal Oil Cooler, and
i. Four Exciter Coolers.

Three SW pumps, not including SW pump 2SW001-2A, are required to be OPERABLE with at least one OPERABLE SW pump in each supply header given the following conditions:

a. Only one unit is in Modes 1, 2, 3, or 4,
b. Two turbine building branch header isolation valves associated with the unit in MODE 1, 2, 3, or 4 are OPERABLE,
c. The turbine building branch header flow path of the other unit is isolated, and
d. At least three Reactor Containment Fan Coolers and one Component Cooling Water Heat Exchanger are isolated.

OPERABILITY of the branch and loop header isolation valves required to automatically align, includes actuation from the loss of power diesel generator start instrumentation. This capability requires that the diesel generator associated with each OPERABLE SW pump is OPERABLE. The OPERABILITY of each automatic branch and loop header isolation valve includes the capability to align automatically when required to support its safety injection function when associated with a unit in Modes 1, 2, 3, or 4.

OPERABILITY of the Booster Pump Suction valves and Strainer Backwash Header isolation valve is dependent upon the SW System flow and configuration. The SW Strainer Backwash Header Isolation valve must be OPERABLE unless all six SW pumps are OPERABLE. SW Booster Pump Suction Isolation Valves must be OPERABLE unless at least five SW pumps are OPERABLE.

INSERT B42B

The ACTIONS are modified by a Note, which ensures appropriate remedial actions are taken, if necessary, if the affected systems are rendered inoperable by an inoperable service water loop header isolation valve.

The number of branch header isolation valves and the number of SW pumps required to be OPERABLE are dependent upon the SW System flow and configuration. (Ref. 7) Therefore, an acceptable alternative to restoration of inoperable equipment may include system reconfiguration and flow reductions.

A.1

Loop header isolation valves must open to ensure adequate cooling of components performing safety related functions in response to conditions requiring actuation of the SW System. When the automatic alignment to the open position of a loop header isolation valve is inoperable, redundancy of the SW supply flow path to the affected safety related system is reduced. In the event of a DBA, the failure of the other isolation valve in the affected loop header to open if closed, could result in the loss of an adequate supply of SW to the affected safety related system unless the valve is open. For these reasons, the affected loop header isolation valve must be open. A Completion Time of 7 days to open the valve is acceptable based on the low probability of a DBA during this period.

Failure of an RCFC loop header isolation valve to open upon receipt of an actual or simulated Engineered Safety Features (ESF) actuation signal will not affect the RCFC loop header isolation valves capability to meet the requirements of LCO 3.6.3, "Containment Isolation Valves". However, failure of a RCFC loop header isolation valve to close will result in entry into the applicable conditions and required actions of LCO 3.6.3, "Containment Isolation Valves". The inability to provide service water flow to a RCFC will result in entry into the applicable conditions and required actions of LCO 3.6.6, "Containment Cooling and Reactor Containment Fan Cooler System".

Failure of a Diesel Generator (DG) loop header isolation valve to open upon receipt of an actual or simulated ESF actuation signal will not result in the associated DG being inoperable as long as the affected valve is placed in the open position. The inability to provide service water flow to a DG will result in entry into the applicable conditions and required actions of LCO 3.8.1, "AC Sources - Operating".

INSERT B42B (continued)

A note is added to Condition A which allows separate condition entry for each loop header. This is acceptable since an inoperable isolation valve in another loop header does not further degrade the redundancy of SW supply to the affected loop header during the specified Completion Time.

B.1

When one required turbine building branch header isolation valve is inoperable, the remaining isolation valve provides assurance that the turbine building branch header will be isolated by a loss of power diesel generator start signal in the absence of a single failure. Without automatic isolation of the turbine building branch header when required, the SW System may not supply adequate flow to safety related systems and isolation of the affected turbine building branch header is required. Alternative action to change the number of required turbine building branch header isolation valves by increasing the number of operable SW pumps is acceptable. The Completion Time of 7 days is acceptable based on the low probability of the need for isolation during the period.

An alternative action is to change the SW configuration such that the Turbine Building Branch Header Isolation Valve is no longer required. Specific SW configuration for the number of required Turbine Building Branch Header Isolation Valves is discussed in the LCO section of the BASES.

INSERT B42B
(continued)

C.1

When one required booster pump suction stop or strainer backwash header isolation valve is inoperable, the affected flow path may not be isolated upon actuation of the SW System. Without isolation of the flow path, the supply of SW to components peforming safety related functions is reduced. A note is added indicating that Separate Entry is allowed for each inoperable booster pump suction stop or strainer backwash header isolation valve. Therefore, all three flow paths could remain available during an accident or transient. The total capacity of the affected flow paths when not isolated by these valves does not exceed the capacity of the turbine building branch header flow path and separate entry is therefore acceptable.

When the affected flow path is isolated, the SW Supply to safety related systems is not reduced. A Completion Time of 7 days to isolate the flow path of each inoperable valve is acceptable based on the low probability of an event during the period. A note is added to Required Action C.1 indicating that the valve used to isolate the affected flow path may be opened intermittently under administrative controls. These administrative controls consist of a dedicated operator to isolate the flowpath.

BASES

ACTIONS D ~~A~~.1 (continued)

provide the required flow rate in the absence of a single active failure

design

pumps are

the remaining OPERABLE SWS ~~train~~ ~~is~~ adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE SWS train could result in loss of SWS function. Required Action A.1 is modified by two Notes. The first Note indicates that the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources—Operating," should be entered if an inoperable SWS train results in an inoperable emergency diesel generator. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops—MODE 4," should be entered if an inoperable SWS train results in an inoperable decay heat removal train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. The ~~72 hour~~ 7 day Completion Time is based on the redundant capabilities afforded by the OPERABLE ~~train~~ pump, and the low probability of a DBA occurring during this time period.

A single pump will not inop. equipment.

INSERT B43A

12

F ~~B~~.1 and F ~~B~~.2

If the ~~SWS train cannot be restored to OPERABLE status within the associated Completion Time,~~ Required Actions and associated Completion Times are not met, or if two or more required SW pumps 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 6 hours and in MODE 5 within 36 hours.

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

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

27

This SR is modified by a Note indicating that the isolation of the SWS components or systems may render those components inoperable, but does not affect the OPERABILITY of the SWS.

Verifying the correct alignment for manual, power operated, and automatic valves in the SWS flow path provides assurance that the proper flow paths exist for SWS operation. This SR does not apply to valves that are locked, sealed, or

(continued)

BASES (continued)

REFERENCES

~~1. UFSAR, Section [9.2.1].~~

~~2. UFSAR, Section [6.2].~~

~~3. UFSAR, Section [5.4.7].~~

INSERT B45A →
Table to clarify
Value Functions

4 ~~1.~~ UFSAR, Section 9.2.1.

5 ~~2.~~ UFSAR, Section 6.2.

6 ~~3.~~ UFSAR, Section 5.4.7.

1. ~~4.~~ Zion Station Probabilistic Safety Study, Section II.7, External Events.

2. ~~5.~~ Sargent and Lundy Calculation ATD-0353, Revision 0, January 28, 1994.

3. ~~6.~~ Branch Technical Position MEB 3-1, Postulated Rupture Locations in Fluid Systems Piping Inside and Outside Containment.

7. Zion Station Updated SW Hydraulic Model Calculation: 22S-B-00220-525, Rev. ~~0~~ 1

INSERT B43A

D.1

If the SW System configuration is not in accordance with the requirements of SR 3.7.8.1, this indicates that SW flow may not be sufficient to meet design basis assumptions for the given accident scenarios. In this instance, eight hours is provided to review SW System configuration and verify that the SW System is within the flow capabilities of OPERABLE SW pumps, in the absence of a single failure. This also provides time in which to change SW System configuration in order to meet the capabilities of OPERABLE SW pumps.

The SW System configuration that determines adequate flow for the number of OPERABLE SW pumps is as follows:

For 6 OPERABLE SW pumps, there are no limits on SW system lineup.

For 5 OPERABLE SW Pumps, a Turbine Lube Oil Cooler per unit is required to be isolated.

For 4 OPERABLE SW pumps, the following loads are isolated:

a. One Turbine Lube Oil Cooler per unit,
b. Each of the following Temperature Control Valves OR its associated Bypass Valve is isolated:

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

For 3 OPERABLE SW Pumps the following loads on the SW System are isolated:

a. One Turbine Lube Oil Coolers on the operating unit and two Turbine Lube Oil Coolers on the shutdown unit,
b. All hydrogen coolers on the shutdown unit,
c. Three Reactor Containment Fan Cooler units,
d. One Component Cooling heat exchanger,

INSERT B43A
(continued)

e. Each of the following Temperature Control Valves OR its associated bypass valve for each of the following coolers:

TCV		BYPASS
1TCV-SW05	Outlet Temp Reg Main turbine Oil Coolers	1SW0222
1TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	1SW0230
1TCV-SW40	Outlet Temp Reg Stator Water Coolers	1SW0292
2TCV-SW05	Outlet Temp Reg Main Turbine Oil Coolers	2SW0222
2TCV-SW04	Hydrogen Coolers SW Outlet Temp Control	2SW0230
2TCV-SW40	Outlet Temp Reg Stator Water Coolers	2SW0292

f. Three Stator Water Coolers,
g. One Generator Air Side Seal Oil Cooler,
h. One 1 H2 Seal Oil Cooler, and
i. Four Exciter Coolers.

Two SW pumps, not including SW pump 2SW001-2A, are required to be OPERABLE provided each supply header has at least one OPERABLE SW pump, for the following conditions:

a. Only one unit is in Modes 1, 2, 3, or 4,
b. Two turbine building branch header isolation valves associated with the unit in Mode 1, 2, 3, or 4 are OPERABLE,
c. The Turbine Building Branch Header flow path of the other unit is isolated, and
d. At least three Reactor Containment Fan Coolers and one Component Cooling Heat Exchanger are isolated.

Once SW System configuration supports SW operability, it is permissible to be in this lineup for seven days while restoring SW System configuration to meet the requirements of SR 3.7.8.1. This is consistent with the seven day Required Actions for other inoperable components of the SW System. If the SW System configuration does not support SW operability within 7 days, then the SW System is operating beyond its design basis, and the provisions of LCO 3.0.3 would apply.

INSERT B43A
(continued)

E.1

If any of the required SW System supply header cross-tie or loop header isolation valves (listed in Table B 3.7.8-1) are inoperable, or if one of the two SW System supply headers is inoperable (e.g., no associated OPERABLE SW pump, or otherwise incapable of supporting cooling of components), action must be taken to restore the SW System supply header to OPERABLE status. In this condition, the remaining OPERABLE SW System supply header is adequate to perform the heat removal function. The 30 day Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE supply header and the low probability of a DBA occurring during this period.

The inability to open an RCFC loop header isolation or cross-tie valve may not affect the RCFC loop header isolation or cross-tie valves capability to meet the requirements of LCO 3.6.3, "Containment Isolation Valves". However, failure of of a RCFC loop header isolation or cross-tie valve to close will result in entry into the applicable conditions and required actions of LCO 3.6.3, "Containment Isolation Valves". The inability to provide service water flow to a RCFC will result in entry into the applicable conditions and required actions of LCO 3.6.6, "Containment Cooling and Reactor Containment Fan Cooler System".

Failure of a Diesel Generator (DG) loop header isolation or cross-tie valve to open or close will not result in the associated DG being inoperable as long as the affected valve is placed in the open position. The inability to provide service water flow to a DG will result in entry into the applicable conditions and required actions of LCO 3.8.1, "AC Sources - Operating".

INSERT B43B

SR 3.7.8.1

The purpose of this surveillance is to verify that for a given configuration of OPERABLE SW pumps the correct valve lineup is in place to ensure that the system is within its analyzed flow capabilities. The SW system has been analyzed to show that for various combinations and system lineups, a minimum number of OPERABLE SW pumps are available following a DBA to maintain the minimum required flow of 1500 gpm to the RCFC coolers. The verification of SW pump operability and valve lineup is performed every seven days, which, given the operational control over plant configuration, is adequate to ensure that system configuration and required number of OPERABLE SW pumps is maintained.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1 (continued)

otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. 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 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.8.2 INSERT B44A Identify signals

This SR verifies proper automatic operation of the SWS automatic valves on an actual or simulated actuation signal. The SWS is a normally operating system that cannot be fully actuated as part of normal testing during unit operation. The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

NRC-03 C9.R1

NA to valves lck'd seal or secured when han. control

INSERT B44B

Insert B44D

33

INSERT B44A

Identify signals

SR 3.7.8.3

This SR verifies proper automatic operation of the ~~SWS~~ pumps on an actual or simulated actuation signal. The SWS system is a normally operating system that cannot be fully actuated as part of normal testing during normal operation. The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

INSERT 44C

33

(continued)

INSERT B44A

(i.e., safety injection, and safe shutdown sequencer by the Loss of Power Diesel Generator Start Instrumentation, LCO 3.3.5).

INSERT B44B

This surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls.

INSERT B44C

SR 3.7.8.~~3~~4

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

This SR is modified by a Note indicating that the automatic actuation is not required for required opposite unit pumps when the pumps are in operation.

Operating experience has shown that the components usually pass the Surveillance when performed at the 18 month Frequency. Therefore the Frequency is acceptable from a reliability standpoint.

INSERT B44D

This SR is modified by a Note indicating that the automatic actuation is not required for required opposite unit pumps when the pumps are in operation.

BASES (continued)

REFERENCES

1. ~~UFSAR, Section [9.2.1].~~ 2
2. ~~UFSAR, Section [6.2].~~ 2
3. ~~UFSAR, Section [5.4.7].~~ 2

INSERT B45A →
TAC to clarify
Value Functions

4 ~~1.~~ UFSAR, Section 9.2.1.

5 ~~2.~~ UFSAR, Section 6.2.

6 ~~3.~~ UFSAR, Section 5.4.7.

1. ~~4.~~ Zion Station Probabilistic Safety Study, Section II.7, External Events.

2. ~~5.~~ Sargent and Lundy Calculation ATD-0353, Revision 0, January 28, 1994.

3. ~~6.~~ Branch Technical Position MEB 3-1, Postulated Rupture Locations in Fluid Systems Piping Inside and Outside Containment.

7. Zion Station Updated SW Hydraulic Model Calculation: 22S-B-00220-525, Rev. ~~0~~ 1

DOC CHANGES

NSHC	NO.	DISCUSSION
L-26.	91.	In CTS 4.10.6, the Surveillance Frequency for the verification of containment temperature has been revised to once per "24 hours" instead of "once per shift." The 24 hour Frequency is considered acceptable based on the observed slow rates of temperature increase within containment as a result of environmental heat sources (due to the large volume of containment). In addition, other indications are available in the control room to alert the operator to an abnormal containment temperature condition.
	92.	Deleted
L-28	93.	This change to the requirements of the CTS 4.9.3.A.2 exempts certain automatic containment isolation valves from the 18 month surveillance testing that would demonstrate satisfactory operation. The valves are exempted because they are locked, sealed, or otherwise secured in the required position under administrative controls. These valves do not reposition in order to fulfill their safety function, and are secured in their required position to fulfill their accident function. Therefore nc automatic isolation is required. This exemption is in accordance with NUREG-1431, Rev 1.
L-29	94.	This change to the requirements of CTS 4.5.1.b.2 eliminates the 18 month surveillance for those required (Accident Inlet, Accident Outlet, and Normal Inlet) dampers that have been secured in the accident position. It would be superfluous to verify the position of such dampers, and any alteration which would allow the dampers to be repositioned would constitute a change to the facility design.
L-A	95.	SR 4.5.1.a.2, verification of SW flow to the RCFC Coolers, has been relocated under the Zion ITS. It has been replaced by performance of ITS SR 3.7.8.1. ITS SR 3.7.8.1 is a valve lineup verification for SW System alignment. It verifies that for a given SW pump and component alignment, accident SW flow is maintained to all SW accident loads, under limiting DBA conditions. Specifically, SW flow of 1500 gpm was verified to the RCFC coolers by performance of a flow analysis, given a minimum SW component alignment. The SW System alignment assumptions of the flow analysis are verified as being met by performance of SR 3.7.8.1. Due to SW System configuration and operational requirements, performing a flow verification using normal SW System alignment does not provide verification of SW flow to the RCFC units in an accident. Realigning SW System configuration to accident conditions and measuring flow is equivalent to verification on a weekly basis that the SW alignment is within the bounds of the assumptions of the flow analysis. In either method, minimum SW flow to SW components under

NSHC NO. DISCUSSION

accident conditions is verified. Performing this verification on a weekly basis is a more restrictive surveillance requirement.

SR 3.7.8.1 will be performed weekly, with an acceptance criteria that ensures SW flow meets accident assumptions within 8 hours, or SW system is outside its design basis and LCO 3.0.3 must be met. This is equivalent to having no RCFCs operable in LCO 3.6.6.

NSHC NO. DISCUSSION

L-6. 11. Requirements for the number of SW pumps that must be operable, the status of the SW discharge header, and components, have been relocated to the Licensee controlled Bases. Additionally the new LCOs and Bases contains operability requirements for the turbine building branch header isolation valves, the loop header isolation valves, the supply header cross-tie and isolation valves, and the Booster Pump Suction and Strainer Backwash Header isolation valves. As indicated in the new Bases, the operability requirements for all these SW components are interrelated and are dependant upon the SW system configuration. **A weekly SR (SR 3.7.8.1) has been added to verify the SW alignment supports design basis accident flows to SW components, specifically the Reactor Containment Fan Coolers.** The requirement for AC and DC power in support of opposite unit service water pumps has been moved to ITS LCOs 3.8.1, 3.8.4, and 3.8.9 to provide continuity with the ITS Definition of OPERABILITY and usage rules.

The operability requirements in the new Bases were derived from a SW Hydraulic Model Calculation which has been included in the list of Bases references. These operability requirements ensure that acceptable SW system performance is achieved for LOOP and LOCA events, considering shared system configurations. **The flow model determines the minimum acceptable SW alignment that will provide the minimum SW flow to specific SW components assumed by the accident analyses. Specifically, 1500 gpm SW flow to the Reactor Containment Fan Coolers is maintained when SW configuration is in accordance with the BASES discussion.** The Bases will be controlled by the Bases Control Process in Chapter 5 of the proposed Technical Specifications.

L-A. 12. The required compensatory actions for inoperable components have been revised to be consistent with the new Bases-defined operability requirements discussed in item 11 above. The revision consists of identifying six Conditions related to the inoperability of key components, and defining the Required Actions for each condition. The components of concern are those that may be vital to overall SW system Operability (depending on the system configuration), as defined in the Bases. A significant feature of the revised Actions and associated Bases is that it is acceptable to re-configure the SW system such that a specific component is no longer required for overall system operability, rather than restore the component to an operable status in accordance with the applicable Required Action.

NSHC NO. DISCUSSION

M. 37. Additional Surveillance Requirements have been provided. SR 3.7.8.~~1~~2 was added to ensure that each SW System automatic valve will actuate to the correct position on an actuation signal. SR 3.7.8.~~2~~3 was added to ensure that each SW pump will start automatically on an ESF actuation signal. SR 3.7.8.~~3~~4 was added to ensure the operability of the auto-start on low header pressure feature of the SW pumps. These changes represent additional restrictions on plant operation necessary to ensure the OPERABILITY of the SW System.

L-A. 38. The Applicability of this Specification has been modified to remove the need for system OPERABILITY during the operation of the crane with loads over irradiated fuel in the fuel building. This is based on the administrative controls to address the movement of any heavy load in the fuel handling building. This information provides details of design or process which are not directly pertinent to the actual requirements, i.e., Limiting Condition for Operation or Surveillance Requirement, which support the safety analysis but rather describe an acceptable method of compliance. These details will be moved to the UFSAR. The controls also assure that the analyzed DBA is bounding for any potential accidents in the fuel handling building. Since these details are not necessary to adequately describe the actual regulatory requirement, they can be moved to licensee controlled documents without a impact on safety. Placing these details in controlled documents provides adequate assurance that they will be maintained. Changes to these details will be controlled by 10 CFR 50.59. This change is consistent with NUREG-1431.

M. 39. The Applicability of the requirements for operation of the fuel handling building exhaust filter system have been expanded from "if there is any irradiated fuel stored in the pool with less than 60 days decay time" to "during movement of irradiated fuel assemblies in the fuel handling building when irradiated fuel assemblies with < 60 days decay time are in the fuel handling building." This includes any time the fuel assembly is in the building (during irradiated fuel movements) rather than just while the fuel assembly is stored in the fuel pool. This is consistent with NUREG-1431 and is an additional restriction on plant operation. (Note: This change also restricts the Applicability to only during the movement of irradiated fuel assemblies. Heavy loads controls for other than during movement of irradiated fuel assemblies are addressed as Relocated ("R") administrative controls in another item of this Amendment request.)

A. 40. The conditions of Applicability have been clarified to describe the conditions identified in the existing Specification. This change is consistent with NUREG-1431 and is considered administrative.

NSHC	NO.	DISCUSSION
M.	52.	Additional Surveillance Requirements have been provided. SR 3.7.9.3 was added to ensure that the system actuates on an actual or simulated actuation signal. SR 3.7.9.4 was added to ensure that the system can maintain appropriate building pressures during the emergency mode. This change represents an additional restriction on plant operation necessary to ensure the OPERABILITY of the CREFS. A Note has been added to SR 3.7.9.3 that indicates automatic actuation is not required when CREFS is operating. Automatic actuation signals that are inoperable require CREFS to be put in service, thus fulfilling the safety function of the system. Therefore a failure of SR 3.7.9.3 from a failure of the automatic actuation signals does not require CREFS to be declared inoperable.
A.	53.	The limit for steam generator activity is presented in a format using DOSE EQUIVALENT I-131. The intent of the Specification, as stated in the current objective section, is to limit the I-131 which could be released as a result of a steam generator tube break; thus the change is administrative in nature.
A.	54.	Appropriate Actions have been provided if the secondary activity limit is not met. Currently, if the limit is not met, no specific Action is provided. Thus, Specification 3.0.3 applies, which is essentially equivalent to the proposed Required Action.
M.	55.	The required Surveillance Frequency has been revised from an event oriented frequency to a periodic frequency of 31 days (proposed SR 3.7.3.1). This SR ensures the I-131 activity is verified to be within the limits of the accident analysis assumptions. This is an additional restriction on plant operation.
L-13.	56.	This Surveillance Requirement has been deleted. This Surveillance does not verify that the activity is less than the limit, but only trends the gross activity, and determines the iodine partition factor of the blowdown tank. Neither of these two analyses provides quantitative information related to current I-131 activity in the secondary coolant which is needed to ensure the accident analysis assumptions are met.
.	57.	Not used.
M.	58.	LCO 3.7.3, "Main Feedwater Isolation Valves (MFIVs), Main Feedwater Regulation Valves (MFRVs), and MFRV Bypass Valves," has been added to the Technical Specifications, consistent with NUREG-1431. This change is an additional restriction on plant operations, and is consistent with safety analyses.

DOD CHANGES

CHANGE NUMBER	DISCUSSION
21.	This change to the Zion ITS eliminates the 18 month surveillance that would verify the RCFC dampers were in their accident position. The surveillance was eliminated because the dampers have been secured in the accident position. Any alteration which would allow the dampers to be repositioned would constitute a change to the facility design.
22.	This change to the Zion ITS deletes NUREG-1431 SR 3.6.6A.2, which has been replaced by performance of ITS SR 3.7.8.1. ITS SR 3.7.8.1 is a valve lineup verification for SW alignment. It verifies that for a given SW pump and component alignment, accident SW flow is maintained to all SW accident loads, under limiting DBA conditions. This is performed weekly, with a requirement to ensure flow meets accident assumptions within 8 hours, or SW system is outside its design basis and LCO 3.0.3 must be met. This is equivalent to having no RCFCs operable in LCO 3.6.6. Specifically, SW flow of 1500 gpm is verified to the RCFC coolers by performance of a flow analysis. The assumptions of this flow analysis are verified as being met by performance of SR 3.7.8.1.

CHANGE NUMBER | DISCUSSION

34. NUREG LCO 3.7.8; Proposed LCO 3.7.8
A new Condition and Required Action has been added to address the relationship between SW pump operability and SW valve and component alignment to provide for minimum flow requirements under DBA conditions.

If the SW system configuration is not in accordance with the requirement for the current SW pump configuration, this indicates that SW flow may not be sufficient to meet design basis assumptions for the given accident scenarios. While in the Required Action, SW configuration must meet the requirements for SW operation during a DBA with a loss of single failure capability; in this instance seven days is an acceptable time frame to restore SW configuration to normal lineup. Failure to meet the requirements for SW pumps or SW valve and component lineup represents a loss of SW function, which will require an entry into LCO 3.0.3.

35. Proposed New SR 3.7.8.1
A new surveillance requirement has been proposed to perform an SW valve and component lineup verification on a weekly basis. The purpose of the valve and component lineup verification is to ensure that the SW system is aligned correctly to support the most limiting case design basis accident, and still maintain correct SW flow to SW components. Specifically, minimum Reactor Containment Fan Cooler flow of 1500 gpm is required to comply with design assumptions of the containment analysis. SW configuration to meet this requirement is provided by meeting SR 3.7.8.1.

NSHC CHANGES

NSHC 3.7 L-6

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change does not result in any hardware changes or changes in operation of equipment. The components covered by these Technical Specifications are not assumed to be initiators of any analyzed event. This change relocates the number of required OPERABLE SW System pumps **and required SW valve and component alignment** to licensee control. Service water hydraulic modeling has been performed on the system, and it has been concluded that the number of required pumps will vary based on system configuration. The number of pumps and actuated components specified in the Bases matches the number required to provide the necessary post accident capability and single failure capability for various plant conditions **in order to provide the required minimum 1500 gpm SW flow to the Reactor Containment Fan Coolers**. Since the number of pumps and components required by the hydraulic modeling will remain available, the change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed). System configuration and the number of required components will be maintained such that mitigation of design basis events will be maintained. Changes in the number of components required or specified operational configurations will be controlled in accordance with the 50.59 process. Therefore, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   This proposed change will relocate control of the number of components required to be operable to licensee control. The minimum required number of components will continue to be maintained utilizing system flow modeling. Since the number of required components will be maintained consistent with the assumed number and any change to the required number will be controlled utilizing the 50.59 process, the change does not involve a significant reduction in a margin of safety.

NSHC CHANGES

NSHC 3.7 L-6

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

   This change does not result in any hardware changes or changes in operation of equipment. The components covered by these Technical Specifications are not assumed to be initiators of any analyzed event. This change relocates the number of required OPERABLE SW System pumps **and required SW valve and component alignment** to licensee control. Service water hydraulic modeling has been performed on the system, and it has been concluded that the number of required pumps will vary based on system configuration. The number of pumps and actuated components specified in the Bases matches the number required to provide the necessary post accident capability and single failure capability for various plant conditions **in order to provide the required minimum 1500 gpm SW flow to the Reactor Containment Fan Coolers**. Since the number of pumps and components required by the hydraulic modeling will remain available, the change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

   The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed). System configuration and the number of required components will be maintained such that mitigation of design basis events will be maintained. Changes in the number of components required or specified operational configurations will be controlled in accordance with the 50.59 process. Therefore, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

   This proposed change will relocate control of the number of components required to be operable to licensee control. The minimum required number of components will continue to be maintained utilizing system flow modeling. Since the number of required components will be maintained consistent with the assumed number and any change to the required number will be controlled utilizing the 50.59 process, the change does not involve a significant reduction in a margin of safety.

MARK UP OF ITS CHANGE

OI 3.8-03; Changes to LCO 3.8.9 that clarify requirements for Condition F.

Condition F of LCO 3.8.9 has been clarified to reflect the requirements of LCO 3.8.9.d, required portions of opposite unit electrical power distribution system.

3.8 ELECTRICAL POWER SYSTEMS

3.8.9 Distribution Systems – Operating

LCO 3.8.9 The following electrical power distribution divisions shall be OPERABLE:

a. Three AC Engineered Safety Feature (ESF) divisions;

b. Two unit-specific and the common DC divisions; and

c. Four AC instrument bus divisions.

d. The necessary portions of the opposite units AC ESF and DC electrical power distribution division(s) required to support opposite unit Service Water equipment required to be OPERABLE by LCO 3.7.8, "Service Water (SW) System."

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One unit-specific AC ESF division inoperable.	A.1	Restore AC ESF division to OPERABLE status.	8 hours AND 16 hours from discovery of failure to meet LCO
B. One unit-specific or common DC division inoperable.	B.1	Restore DC division to OPERABLE status.	2 hours AND 16 hours from discovery of failure to meet LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. One AC instrument bus division inoperable.	C.1	Restore AC instrument bus division to OPERABLE status.	2 hours AND 16 hours from discovery of failure to meet LCO
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 AND D.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours
E. Two or more required electrical power distribution divisions inoperable that result in a loss of function.	E.1	Enter LCO 3.0.3.	Immediately
F. One or more portions of the required opposite unit electrical power distribution division(s) inoperable.	F.1	Declare required feature(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.9.1	Verify correct breaker alignments and voltage to each required AC ESF, DC, and AC instrument bus electrical power distribution division.	7 days

NUREG MARKUPS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
4.15.2.D 3.15.2.H D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3.	6 hours
	AND	
	D.2 Be in MODE 5.	36 hours
NRC-DC (C1) E. Two or more required electrical power distribution divisions inoperable that result in a loss of function.	E.1 Enter LCO 3.0.3.	Immediately
(44) F. One or More Portions of the Required opposite unit electrical power distribution division(s) inoperable	Declare required Feature inoperable	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.9.1	Verify correct breaker alignments and voltage to ~~[required]~~ each ESF AC, DC, and AC ~~vital~~ instrument bus electrical power distribution ~~subsystems~~ division.	7 days

new terms

MARK UP OF ITS CHANGE

OI 3.3-17; change the NOTE in Required Action E.2 to reflect renumbered Functions.

The ESFAS Instrumentation Function Table has been renumbered, and the NOTE for Required Action E.2 needs to be changed to reflect the new Function number.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition B, C, OR D not met.	E.1 Be in MODE 3. AND E.2 --------NOTE--------- Not applicable to Functions 6.a.2 and 6.~~d~~ c . --------------------- Be in MODE 4.	6 hours 12 hours
F. As required by Required Action A.1 and referenced in Table 3.3.2-1.	F.1 --------NOTE--------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. --------------------- Place channel in trip.	 6 hours

(continued)

BASES

E.1 and E.2

If the Required Action and associated Completion Time of Condition B, C or D, are not met, the unit must be placed in MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems. Placing the unit in MODE 4 removes all requirements for OPERABILITY of the required functions. In this MODE, the unit does not have analyzed transients or conditions that require the explicit use of the protection functions noted above.

Required Action E.2 is modified by a Note that indicates the Required Action is not applicable to the Auxiliary Feedwater Undervoltage Reactor Coolant Pump functions (functional units 6.a.2 and 6.~~d~~c) since the applicable MODES for these items are only MODES 1 and 2.

F.1

Condition F applies to the following SI functions:

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

(continued)

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ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
E. Required Action and associated Completion Time of Condition B, C, OR D not met.	E.1	Be in MODE 3.	6 hours
	AND		
	E.2	--------NOTE--------- Not applicable to Functions 6.a.2 and 6. c. ---------------------	
		Be in MODE 4.	12 hours
F. As required by Required Action A.1 and referenced in Table 3.3.2-1.	F.1	--------NOTE--------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. ---------------------	
		Place channel in trip.	6 hours

(continued)

BASES

E.1 and E.2

If the Required Action and associated Completion Time of Condition B, C or D, are not met, the unit must be placed in MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems. Placing the unit in MODE 4 removes all requirements for OPERABILITY of the required functions. In this MODE, the unit does not have analyzed transients or conditions that require the explicit use of the protection functions noted above.

Required Action E.2 is modified by a Note that indicates the Required Action is not applicable to the Auxiliary Feedwater Undervoltage Reactor Coolant Pump functions (functional units 6.a.2 and 6.c) since the applicable MODES for these items are only MODES 1 and 2.

F.1

Condition F applies to the following SI functions:

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

(continued)

NUREG MARKUPS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. As required by Required Action A.1 and referenced in Table 3.3.2-1.	C.1 --------NOTE--------- One additional channel may be bypassed for up to 4 hours for surveillance testing. ---------------------- Place channel in bypass.	6 hours
D. As required by Required Action A.1 and referenced in Table 3.3.2-1.	D.1 Restore train to OPERABLE status.	6 hours
E. Required Action and associated Completion Time of Condition B, C, OR D not met.	E.1 Be in MODE 3.	6 hours
	AND	
	E.2 --------NOTE--------- Not applicable to Function ~~6.d.~~ 6c s 6A AND --------------------- Be in MODE 4.	12 hours
F. As required by Required Action A.1 and referenced in Table 3.3.2-1.	F.1 --------NOTE--------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. -------------------- Place channel in trip.	6 hours

MARK UP OF ITS CHANGE

OI 3.5-12; Additional discussion of administrative controls for accumulator discharge valves.

BASES for SR 3.5.1.1, Accumulator Valve Position Verification, discusses administrative controls for verifying the accumulator discharge valves have not been repositioned since the valve operator was deenergized. This additional discussion clarifies current operational practice in the BASES.

BASES

ACTIONS

C.1 and C.2 (continued)

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

D.1

If two or more accumulators are inoperable, the unit is in a condition outside the accident analyses; therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

Each accumulator valve should be verified to be full open prior to removing power from the valve operator. This verification ensures that the accumulators are available for injection in the event of a LOCA. If an isolation valve is not fully open, the rate of injection to the RCS would be reduced and may result in not meeting accident analyses assumptions. Continued assurance each valve remains in the required position is provided by removing the electrical power from the valve operator. **SR 3.5.1.6 requires verification that power is removed from the valve monthly.** Subsequent verification (i.e., each verification of valve position after the initial opening of the valve and subsequent removal of power to the valve operator) that the valve is open may be met by ensuring the valve has not been energized since the last performance of SR 3.5.1.6 and the valve operator has sufficient administrative controls placed on its movement to ensure it has not been repositioned since the valve operator was deenergized. ~~Sufficient administrative controls consists of placing out of service cards on the valve operators and electrical breakers.~~ **Administrative controls consists of station procedures and practices that require equipment be manipulated under control of the operations group. In addition, the breakers and control switches are labeled to identify that the normal position for the breaker is open.** This Frequency is considered reasonable since motor operated valve position should not change with power removed. In

(continued)

CLEAN ITS SPEC

BASES

ACTIONS

C.1 and C.2 (continued)

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

D.1

If two or more accumulators are inoperable, the unit is in a condition outside the accident analyses; therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

Each accumulator valve should be verified to be full open prior to removing power from the valve operator. This verification ensures that the accumulators are available for injection in the event of a LOCA. If an isolation valve is not fully open, the rate of injection to the RCS would be reduced and may result in not meeting accident analyses assumptions. Continued assurance each valve remains in the required position is provided by removing the electrical power from the valve operator. **SR 3.5.1.6 requires verification that power is removed from the valve monthly.** Subsequent verification (i.e., each verification of valve position after the initial opening of the valve and subsequent removal of power to the valve operator) that the valve is open may be met by ensuring the valve has not been energized since the last performance of SR 3.5.1.6 and the valve operator has sufficient administrative controls placed on its movement to ensure it has not been repositioned since the valve operator was deenergized. **Administrative controls consists of station procedures and practices that require equipment be manipulated under control of the operations group. In addition, the breakers and control switches are labeled to identify that the normal position for the breaker is open.** This Frequency is considered reasonable since motor operated valve position should not change with power removed. In addition, administrative controls ensure a mispositioned isolation valve is unlikely.

(continued)

NUREG MARKUPS

BASES

ACTIONS (continued)

Editorial

D.1

If ~~more than one~~ two or more accumulator(s) ~~is~~ are inoperable, the ~~plant~~ unit is in a condition outside the accident analyses; therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

2

SR 3.5.1.1

in the event of a LOCA.

Each accumulator valve should be verified ~~to be~~ fully open ~~every 12 hours~~. Prior to removing power from the valve operator. This verification ensures that the accumulators are available for injection ~~and ensures timely discovery if a valve should be less than fully open~~. If an isolation valve is not fully open, the rate of injection to the RCS would be reduced. ~~Although a~~ motor operated valve position should not change with power removed, ~~a closed valve could~~ and may result in not meeting accident analyses assumptions. This Frequency is considered reasonable ~~in view of other~~ since administrative controls that ensure a mispositioned isolation valve is unlikely.

INSERT "F"

In addition,

SR 3.5.1.2 and SR 3.5.1.3

Editorial

Every 12 hours, borated water volume and nitrogen cover pressure are verified for each accumulator. A 12 hour ~~This~~ Frequency is sufficient to ensure these parameters are within limits ~~adequate injection during a LOCA~~. Because of the static design of the accumulator, ~~a 12 hour Frequency~~ This Surveillance usually allows the operator to identify changes before limits are reached. Operating experience has shown ~~this~~ the Frequency of this Surveillance to be appropriate for early detection and correction of off normal trends.

SR 3.5.1.4 and SR 3.5.1.5

REFORMAT

The boron concentration should be verified to be within required limits for each accumulator every 31 days since the static design of the accumulators limits the ways in which the concentration can be changed. The 31 day Frequency is adequate to identify changes that could occur from ~~mechanisms such as stratification or~~ inleakage. Sampling the affected accumulator within 6 hours after a ~~1%~~ volume increase of 5% indicated level? will identify whether inleakage has caused a reduction in boron concentration to below the required

Plant Specific Value

(continued)

INSERT "D"

LOCA analysis, an accumulator water volume of 853 ft^3 which represents a value between the allowable maximum and minimum volumes is assumed since a small break LOCA is less sensitive than a large break LOCA to accumulator water volume. Both the large break and small break

INSERT "E"

ensures boron precipitation will not occur in the core prior to the initiation of hot leg recirculation injection. The maximum limit also ensures the post-LOCA minimum sump pH requirements are met.

INSERT "F"

Continued assurance each valve remains in the required position is provided by removing the electrical power from the valve operator. SR 3.5.6.1 requires verification that power is removed from the valve monthly. Subsequent verification (i.e., each verification of valve position after the initial opening of the valve and subsequent removal of power to the valve operator) that the valve is open may be met by ensuring the valve has not been energized since the last performance of SR 3.5.1.6 and the valve operator has sufficient administrative controls placed on its movement to ensure it has not been repositioned since the valve operator was deeenergized. Administrative controls consists of station procedures and practices that require equipment be manipulated under control of the operations group. In addition, the breakers and control switches are labeled to identify that the normal position for the breaker is open.

INSERT "G"

ensures the accumulators are available for injection and that an active failure could not result in the

MARK UP OF DOD CHANGE

OI DOD 3.5-01, DOD 3.5-22; Discussion of differences from NUREG-1431, generic ITS.

DOD 3.5-22 was modified to remove prescriptive details contained in the NUREG-1431 BASES discussion that discusses the proper methods and timing for adjusting RCP seal injection flow.

CHANGE NUMBER | DISCUSSION

22. Proposed SR 3.5.5.1 has been modified to remove prescriptive details outlining performance methods which verify the manual seal injection valves are set to provide a flow equivalent to ≤ 80 gpm at 0 psig RCS pressure. This surveillance has been rewritten to specify the analytic limit, moving performance methods to the Bases.~~1 has been modified to verify the manual seal injection valves are set to provide a flow equivalent to ≤ 80 gpm at 0 psig RCS pressure. During operation in MODES 1, 2, or 3, a direct measurement of seal injection flow does not ensure the flow rate is within the limit assumed in the safety analysis for the Design Basis Accident since the RCS pressure is significantly greater than 0 psig. To account for the increase in RCS pressure, a flow equivalency is calculated using the discharge pressure from the centrifugal charging pumps, RCS pressure, and a known flow line resistant value. Placing the charging flow control valve in the full open position to perform the test in not necessary at Zion Station since the centrifugal charging pump discharge pressure is measured down stream of the flow control valve and would not influence the results of the test.~~ The FREQUENCY has also been modified from "31 days" to "Prior to entering MODE 2 whenever RCS pressure has been < 1000 psig". During a unit heatup from cold shutdown, the seal injection valves are throttled as required to ensure the RCP seals receive the required flow. At approximately 1000 psig the seal injection valves are typically set.~~the seal injection valves are throttled as required to ensure the RCP seals received the required flow. At approximately 1000 psig the seal injection valves should be set.~~ Minor adjustments are then made using the RCP Labyrinth ΔP Controller Valve. If after entering MODE 2 further adjustment of the manual throttle valves is required, the unit would enter the REQUIRED ACTIONS of LCO 3.5.5 until the flow has been confirmed to be within the limit of the safety analysis.~~ This is accomplished by satisfactorily performing SR 3.5.5.1.~~

23. SR 3.5.2.3 in NUREG-1431 verifies the ECCS piping is full of water every 31 days. This SR was not retained in the proposed Zion Station Improved Technical Specifications because the installed piping does not contain the appropriate vent paths to ensure there is no entrained gasses in the piping. This requirement is not specified in Zion Station's CTS.

24. The last two sentences in the first paragraph in the Applicability of Specification 3.5.2 were deleted since they do not accurately reflect the basis for the centrifugal and safety injection pumps at Zion Station. As previously stated in the Background Section, the design basis for the centrifugal charging, SI, and RHR pumps is based on vendor supplied test curves. Actual pump curves are periodically checked as part of the IST program to verify acceptable degradation. To establish an acceptable limit of pump performance, all pump curves are evaluated. The most limiting point from each curve is chosen and a new combined curve is generated that bounds all of the individual curves. This curve is then degraded to allow for future degradation and measurement uncertainties. The amount of degradation applied to the curve bounds the required

CLEAN DOD

CHANGE NUMBER — DISCUSSION

22. Proposed SR 3.5.5.1 has been modified to remove prescriptive details outlining performance methods which verify the manual seal injection valves are set to provide a flow equivalent to $\leq$ 80 gpm at 0 psig RCS pressure. This surveillance has been rewritten to specify the analytic limit, moving performance methods to the Bases. The FREQUENCY has also been modified from "31 days" to "Prior to entering MODE 2 whenever RCS pressure has been < 1000 psig". During a unit heatup from cold shutdown, the seal injection valves are throttled as required to ensure the RCP seals receive the required flow. At approximately 1000 psig the seal injection valves are typically set. Minor adjustments are then made using the RCP Labyrinth ΔP Controller Valve. If after entering MODE 2 further adjustment of the manual throttle valves is required, the unit would enter the REQUIRED ACTIONS of LCO 3.5.5 until the flow has been confirmed to be within the limit of the safety analysis.

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24. The last two sentences in the first paragraph in the Applicability of Specification 3.5.2 were deleted since they do not accurately reflect the basis for the centrifugal and safety injection pumps at Zion Station. As previously stated in the Background Section, the design basis for the centrifugal charging, SI, and RHR pumps is based on vendor supplied test curves. Actual pump curves are periodically checked as part of the IST program to verify acceptable degradation. To establish an acceptable limit of pump performance, all pump curves are evaluated. The most limiting point from each curve is chosen and a new combined curve is generated that bounds all of the individual curves. This curve is then degraded to allow for future degradation and measurement uncertainties. The amount of degradation applied to the curve bounds the required developed head assumed in the safety analysis.

MARK UP OF ITS CHANGE

OI 3.7-27; Clarification of Control Room Ventilation System temperature control ranges.

BASES discussion for Control Room Ventilation System (CRVS), B 3.7.10, has been clarified that the temperature control range for the CRVS is maintained between 65 and 85 Degrees F.

B 3.7 PLANT SYSTEMS

B 3.7.10 Control Room Ventilation System (CRVS)

BASES

BACKGROUND	The CRVS is a shared system which provides temperature control for the control room both during normal operation and following isolation of the control room. The control room envelope includes the control rooms for both units. The CRVS consists of two independent and redundant trains (except for shared ductwork and dampers) that provide cooling and heating of recirculated control room air. However, the system is treated as a single train system for each unit. Each unit's CRVS consists of heating coils, cooling coils, a humidifier, instrumentation, and controls to provide for control room temperature control. However, the heating coils and the humidifier have no post accident function and are not powered from emergency buses. The CRVS is a normal system which also operates during emergency unit operations. The CRVS will provide the required temperature control to maintain the control room ~~at a nominal~~ **within a temperature range of** 65°F to 85°F. The CRVS operation in maintaining the control room temperature is discussed in the UFSAR, Section 9.4.1 (Ref. 1).
APPLICABLE SAFETY ANALYSES	The design basis of the CRVS is to maintain the control room temperature for continuous occupancy under any normal or abnormal condition to permit safe shutdown of the plant. The CRVS components are arranged such that each unit controls a 100% capacity, safety related train. During emergency operation, the CRVS maintains the temperature ~~at a nominal~~ **within a temperature range of** 65°F to 85°F. 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 CRVS is designed in accordance with Seismic Category I requirements. The CRVS is capable of removing sensible and latent heat loads from the control room, which includes consideration of equipment heat loads, to ensure equipment OPERABILITY, and personnel occupancy capability. The CRVS satisfies Criterion 3 of the NRC Policy Statement.

(continued)

CLEAN ITS SPEC

B 3.7 PLANT SYSTEMS

B 3.7.10 Control Room Ventilation System (CRVS)

BASES

BACKGROUND

The CRVS is a shared system which provides temperature control for the control room both during normal operation and following isolation of the control room. The control room envelope includes the control rooms for both units.

The CRVS consists of two independent and redundant trains (except for shared ductwork and dampers) that provide cooling and heating of recirculated control room air. However, the system is treated as a single train system for each unit. Each unit's CRVS consists of heating coils, cooling coils, a humidifier, instrumentation, and controls to provide for control room temperature control. However, the heating coils and the humidifier have no post accident function and are not powered from emergency buses.

The CRVS is a normal system which also operates during emergency unit operations. The CRVS will provide the required temperature control to maintain the control room within a temperature range of 65°F to 85°F. The CRVS operation in maintaining the control room temperature is discussed in the UFSAR, Section 9.4.1 (Ref. 1).

APPLICABLE SAFETY ANALYSES

The design basis of the CRVS is to maintain the control room temperature for continuous occupancy under any normal or abnormal condition to permit safe shutdown of the plant.

The CRVS components are arranged such that each unit controls a 100% capacity, safety related train. During emergency operation, the CRVS maintains the temperature within a temperature range of 65°F to 85°F. 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 CRVS is designed in accordance with Seismic Category I requirements. The CRVS is capable of removing sensible and latent heat loads from the control room, which includes consideration of equipment heat loads, to ensure equipment OPERABILITY, and personnel occupancy capability. The CRVS satisfies Criterion 3 of the NRC Policy Statement.

(continued)

NUREG MARKUPS

B 3.7 PLANT SYSTEMS

B 3.7.~~11~~ 10 Control Room ~~Emergency Air Temperature Control~~ Ventilation System (CREATCS)

BASES

BACKGROUND

The CREATCS provides temperature control for the control room following isolation of the control room.

The CREATCS consists of two independent and redundant trains that provide cooling and heating of recirculated control room air. Each train consists of heating coils, cooling coils, a humidifier, instrumentation, and controls to provide for control room temperature control. The CREATCS is a subsystem providing air temperature control for the control room.

Heating coils not required

The CREATCS is an emergency system, ~~parts of~~ which may also operate during normal unit operations. A single train will provide the required temperature control to maintain the control room ~~between [70]°F and [85]°F~~ within a temperature range. The CREATCS operation in maintaining the control room temperature is discussed in the FSAR, Section ~~[6.4]~~ 9.4.1 (Ref. 1).

65F to 85F

APPLICABLE SAFETY ANALYSES

The design basis of the CREATCS is to maintain the control room temperature for ~~30 days of~~ continuous occupancy.

The CREATCS components are arranged in ~~redundant,~~ two 100% capacity safety related trains. During emergency operation, the CREATCS maintains the temperature ~~between [70]°F and [85]°F~~ within a temperature range. A ~~single active failure of a component of the CREATCS, with 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 CREATCS is designed in accordance with Seismic Category I requirements. The CREATCS is capable of removing sensible and latent heat loads from the control room, which include consideration of equipment heat loads and personnel occupancy ~~requirements,~~ capability, to ensure equipment OPERABILITY.

65F to 85F

The CREATCS satisfies Criterion 3 of the NRC Policy Statement.

(continued)

MARK UP OF DOD CHANGE

DOD 3.3.1-01; Clarification of DOD 3.3.1-25

DOD 3.3.1-25 was clarified to specifically identify that the new insert "M" is an insert to the BASES.

CHANGE NUMBER	DISCUSSION

21. (continued)

A discussion was added to address the effects on P-7 on increasing and decreasing power for both the Auto Stop Oil and Turbine Stop Valve Functions,

"Turbine Electrohydraulic Control System" was changed to "Turbine Lube Oil System" since lube oil pressure is monitored not EHC fluid pressure.

22. GENERAL COMMENT. The discussion of the Actions in the Bases has been revised to conform to the changes made to the Conditions, Required Actions and Surveillance Requirements in the Action Table of the proposed ITS (Reference DOD #11). In part, the revised Actions Table removed the default actions to a separate Condition. For example, "be in MODE 3", "Reduce THERMAL POWER to < P-7", and "Open RTBs" are now new Conditions. For many of the RTS functions described in the Bases this change resulted in the elimination of the shutdown action discussions. To assist the reviewer in identifying differences from the NUREG, the portion of the Bases information retained in the Zion Station submittal has been enclosed in a circle. Where differences occur that are beyond conforming changes as described, a separate discussion has been provided.

23. The discussion associated with Insert "J" was previously contained in Condition U and merely represents relocated information.

24. The Note discussion in the Bases for Condition D has been enhanced to address the full intent of the Note as it appears in the Technical Specifications. Specifically, the Note also applies to setpoint adjustment of other channels. As such, this information has been included.

25. The discussion associated with Insert "M" to the BASES (New Condition U) provides a consistent approach to a loss of function which may exist when two or more required channels are inoperable.

26. Information has been provided which clarifies that only the protective functions with installed bypass capability can be tested in bypassed. For Zion Station, the Eagle 21 Process Protection System has installed bypass capability and the instrument functions processed by Eagle 21 can be bypassed.

27. Clarifying information was provided related to NIS channel adjustments in SR 3.3.1.2 and SR 3.3.1.3. In SR 3.3.1.2 an adjustment consists of setting the gain in the NIS power range channels to match the results of the calorimetric heat balance. In SR 3.3.1.3 a calibration is performed (if required) and new currents are installed based on the most recent incore flux map.

MARK UP OF DOD CHANGE

OI DOD 3.2-01; Update of DOD 3.2-21

The correct, updated WCAP reference has been added to DOD 3.2-21.

CHANGE NUMBER | DISCUSSION

21. LCO 3.2.1; Heat Flux Hot Channel Factor ($F_Q(Z)$.
Required Action B in the NUREG has been modified to allow an alternative to reducing AFD limits when $F^W_Q(Z)$ is not within limit. The proposed change allows the option to reduce Thermal Power below the APL. The APL represents the highest percentage of RATED THERMAL POWER at which the unit can operate and still be assured that $F_Q(Z)$ will be maintained below the required limit. This is due, in part, to the fact that the determination of APL considers the function of W(Z), where W(Z) is a cycle dependent function that accounts for power distribution transients encountered during normal operation. Since the function of W(Z) varies over core height, the resultant affect on APL will also vary. Thus, a reduction in Thermal Power below the APL represents an enhanced approximation of the reduction in Thermal Power necessary to ensure the $F_Q(Z)$ limit is not violated and thereby affords an equivalent level of protection currently provided by reducing the AFD limits. A detailed discussion of Allowed Power Level as it applies to the Heat Flux Hot Channel Factor is provided in ~~WCAP-10216 Rev. 1,~~ WCAP-10217-A, "Relaxation of Constant Axial Offset Control-F_Q Surveillance Technical Specifications." ~~WCAP-10216~~ WCAP-10217-A has previously been found acceptable by the NRC Staff as documented in the Safety Evaluation Report dated November 26, 1993.

22. LCO 3.2.1; Heat Flux Hot Channel Factor ($F_Q(Z)$.
A new Required Action (RA B.2) has been added which requires a verification that $F^W_Q(Z)$ is restored to within limits prior to increasing Thermal Power or restoring AFD limits. The addition of this step is consistent with existing NUREG step A.4 in that it ensures that core conditions during operations at higher power levels or relaxed AFD limits are consistent with safety analysis assumptions.

23. LCO 3.2.1; Heat Flux Hot Channel Factor ($F_Q(Z)$.
A Note has been added to existing Required Action A.4 and proposed Required Action B.2. The intent of this Note is to ensure the associated Required Action is performed even though the requirements of the LCO may have been met by taking the preceding actions.

CLEAN DOD

CHANGE NUMBER	DISCUSSION

21. LCO 3.2.1; Heat Flux Hot Channel Factor ($F_Q(Z)$).
Required Action B in the NUREG has been modified to allow an alternative to reducing AFD limits when $F^W_Q(Z)$ is not within limit. The proposed change allows the option to reduce Thermal Power below the APL. The APL represents the highest percentage of RATED THERMAL POWER at which the unit can operate and still be assured that $F_Q(Z)$ will be maintained below the required limit. This is due, in part, to the fact that the determination of APL considers the function of W(Z), where W(Z) is a cycle dependent function that accounts for power distribution transients encountered during normal operation. Since the function of W(Z) varies over core height, the resultant affect on APL will also vary. Thus, a reduction in Thermal Power below the APL represents an enhanced approximation of the reduction in Thermal Power necessary to ensure the $F_Q(Z)$ limit is not violated and thereby affords an equivalent level of protection currently provided by reducing the AFD limits. A detailed discussion of Allowed Power Level as it applies to the Heat Flux Hot Channel Factor is provided in WCAP-10217-A, "Relaxation of Constant Axial Offset Control-F_Q Surveillance Technical Specifications." WCAP-10217-A has iously been found acceptable by the NRC Staff as documented .ne Safety Evaluation Report dated November 26, 1993.

22. LCO 3.2.1; Heat Flux Hot Channel Factor ($F_Q(Z)$).
A new Required Action (RA B.2) has been added which requires a verification that $F^W_Q(Z)$ is restored to within limits prior to increasing Thermal Power or restoring AFD limits. The addition of this step is consistent with existing NUREG step A.4 in that it ensures that core conditions during operations at higher power levels or relaxed AFD limits are consistent with safety analysis assumptions.

23. LCO 3.2.1; Heat Flux Hot Channel Factor ($F_Q(Z)$).
A Note has been added to existing Required Action A.4 and proposed Required Action B.2. The intent of this Note is to ensure the associated Required Action is performed even though the requirements of the LCO may have been met by taking the preceding actions.

MARK UP OF ITS CHANGE

OI 3.7-25, Clarification of BASES for SR 3.7.9.3, Verification CREFS starts and operates on actual or simulated actuation signal.

The BASES discussion for SR 3.7.9.3 was clarified to explain exactly what the NOTE that modifies the SR is trying to do. In the case where the automatic actuation signals are inoperative, the SR would fail and the CREFS would have to be declared inoperable. Since a failed instrument requires CREFS to be put in service, and an inoperable CREFS would require plant shutdown, there is a conflict that the NOTE resolves. Putting CREFS in service fulfills the safety function of CREFS, and is appropriate for an inoperable actuation instrument.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.9.1

Standby systems should be checked periodically to ensure that they function properly (e.g., differential pressure and flow are in accordance with the VFTP). As the environment and normal operating conditions on this system are not too severe, testing the components in the makeup flow path once every 31 days provides an adequate check of this system. The system has no heaters and therefore, need only be operated for ≥ 15 minutes to demonstrate the function of the system. The 31 day Frequency is based on engineering judgement.

SR 3.7.9.2

This SR verifies that the required CREFS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CREFS filter tests are in general conformance with ANSI N510-1975 (Ref. 3). The VFTP includes testing the performance of the HEPA filter, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.9.3

This SR verifies that the CREFS starts and operates on an actual or simulated actuation signal. This SR is modified by a Note indicating that automatic actuation is not required when the the CREFS is operating. If the automatic actuation signals are inoperable, LCO 3.3.7 Actions require the CREFS to be put in service, thus fulfilling the safety function of the system. Therefore a failure of SR 3.7.9.3 from a failure of the automatic actuation signals does not require CREFS to be declared inoperable. Actuation signals are identified in LCO 3.3.7, "CREFS Actuation Instrumentation." The Frequency of 18 months is consistent with Regulatory Guide 1.52 (Ref. 4).

(continued)

NUREG MARKUPS

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.~~10~~9.1 (continued)

demonstrate the function of the system.] The 31 day Frequency is based on ~~the reliability of the equipment and the two train redundancy availability~~ engineering judgement.

SR 3.7.~~10~~9.2

This SR verifies that the required CREFS testing is performed in accordance with the [Ventilation Filter Testing Program (VFTP)]. The CREFS filter tests are in ~~accordance~~ general conformance with ~~Regulatory Guide 1.52~~ ANSI N510-1975 (Ref. 3). The [VFTP] includes testing the performance of the HEPA filter, charcoal adsorber efficiency, minimum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the [VFTP].

Insert B55A

SR 3.7.~~10~~9.3

This SR verifies that ~~each~~ the CREFS ~~train~~ starts and operates on an actual or simulated actuation signal. Actuation signals are identified in LCO 3.3.7 "CREFS Actuation Instrumentation". The Frequency of [18] months is ~~specified in~~ Consistent with Regulatory Guide 1.52 (Ref. ~~3~~). This SR is modified by a Note indicating that automatic actuation is not required when the CREFS is operating.

SR 3.7.~~10~~9.4

This SR verifies the integrity of the control room enclosure, and the ~~assumed inleakage~~ makeup air flow rate~~s of the potentially contaminated air~~. The control room positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper functioning of the CREFS. ~~During the emergency mode of operation,~~ The CREFS, with CRVS, is designed to pressurize the control room envelope to approximately ~~≥~~ [0.125] inches water gauge positive pressure with respect to adjacent areas in order to prevent unfiltered inleakage. With the required control room integrity, the CREFS is designed to maintain this positive pressure with ~~one train of~~ a makeup flow rate of ~~[3000]~~ ≥1600 cfm and ≤2200 cfm. The Frequency of [18] months ~~on a STAGGERED TEST BASIS~~ is consistent with the guidance provided in NUREG-0800 (Ref. ~~4~~ 5).

design
consist. 3.7.12 3.7.14
edit
design
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not in test.
design
Allows 2CVS 3.7.11
test as unit.
edit.

(continued)

INSERT B55A

If the automatic actuation signals are inoperable, LCO 3.3.7 Actions require the CREFS to be put in service, thus fulfilling the safety function of the system. Therefore a failure of SR 3.7.9.3 from a failure of the automatic actuation signals does not require CREFS to be declared inoperable.

DOD CHANGES

CHANGE NUMBER | DISCUSSION

14. NUREG LCO 3.7.10; Proposed LCO 3.7.9:
NUREG LCO 3.7.12; Proposed LCO 3.7.12:
NUREG LCO 3.7.14; Proposed LCO 3.7.11:
The CREFS, PTEFS, and ECCS & CS CEFS have only one mode of operation. This mode is the "emergency mode" or "post accident mode" and does not need to be described as such. Therefore, all references to the type of mode which seem to indicate that the system has more than one operating mode are eliminated. This is reflected in SR 3.7.9.4, SR 3.7.11.4, and SR 3.7.12.3.

15. NUREG LCO 3.7.10; Proposed LCO 3.7.9:
NUREG LCO 3.7.11; Proposed LCO 3.7.10:
The CREFS and CRVS are designed and approved as single train systems. Either train of CRVS (one associated with each unit) can function to provide the ventilation requirements of both unit's control rooms. CRVS is not reflected in the current TS, and only requirements for the filters of the CREFS are included in the current TS. Therefore, several changes are proposed to the Actions to reflect the single train system and current practices. These include adopting the current 7 day Completion Time for an inoperable filter as applicable to the entire system for both CREFS and CRVS. Furthermore, the NUREG Surveillance for CRVS is modified to reflect acceptable test practices, and eliminate testing that can not be accomplished without additional design modifications and/or analyses. The SR for auto start of the CREFS is not required if the system is in operation. Automatic actuation signals that are inoperable require CREFS to be put in service, thus fulfilling the safety function of the system. Therefore a failure of SR 3.7.9.3 from a failure of the automatic actuation signals does not require CREFS to be declared inoperable.

16. NUREG LCO 3.7.10; Proposed LCO 3.7.9:
The CREFS does not include a toxic gas protection mode. The UFSAR, Sections 2.2 and 6.4, provides a discussion of the evaluation which concludes such protection is unnecessary.

17. NUREG LCO 3.7.12; Proposed LCO 3.7.12:
NUREG LCO 3.7.14; Proposed LCO 3.7.11:
The ECCS & CS CEFS and the PTEFS are single train systems that are currently not addressed in the TS except for filter testing. Therefore, several changes are proposed to the Actions to reflect the single train system and current practices. These include adopting the current 7 day Completion Time for an inoperable filter as applicable to the entire system for both ECCS & CS CEFS and the PTEFS. The SR for auto start of the PTEFS is not required if the system is in operation.

18. NUREG LCO 3.7.12; Proposed LCO 3.7.12:
These changes reflect that the ECCS & CS CEFS is manually initiated along with the manual initiation of the recirculation phase of the ECCS.

MARK UP OF ITS CHANGE

OI 3.7-24; Page 5.0-21, Section 5.5.9, Ventilation Filter Test Prograrn description to clarify flowrate and DP testing conditions.

This change clarifies the testing conditions for flowrate and filter up when testing the ESF filter systems.

5.5 Programs and Manuals

5.5.9 Ventilation Filter Testing Program (VFTP) (continued)

d. Demonstrate for each of the ESF filter systems that the pressure drop across the combined HEPA filters, the prefilters, and the charcoal adsorbers is ≤ 6 inches of water **adjusted to the maximum design flowrate** when tested in general conformance with ANSI N510-1975 at the flowrate specified below. Verification of the specified flowrates may be accomplished during the performance of SR 3.7.9.4, SR 3.7.12.3, and SR 3.7.13.5 as applicable. The PTEFS and the FHBEFS filters are shared and as such, will be tested in the FHBEFS mode.

ESF Filter System	Flowrate
Control Room Emergency	≥ 1600, ≤ 2200 cfm
Fuel Handling Building Exhaust	≤ 24,000 cfm
Emergency Core Cooling System and Containment Spray Cubicle Exhaust	≤ 48,000 cfm

5.5.10 Explosive Gas and Storage Tank Radioactivity Monitoring Program

This program provides controls for potentially explosive gas mixtures contained in the waste gas system, the quantity of radioactivity contained in gas decay tanks or fed into the offgas treatment system, and the quantity of radioactivity contained in unprotected outdoor liquid storage tanks. The gaseous radioactivity quantities shall be determined following the methodology in Branch Technical Position (BTP) ETSB 11-5, "Postulated Radioactive Release due to Waste Gas System Leak or Failure." The liquid radwaste quantities shall be determined in accordance with the ODCM.

The program shall include:

a. The limits for concentrations of hydrogen and oxygen in the waste gas system and a surveillance program to ensure the limits are maintained. Such limits shall be appropriate to the system's design criteria (i.e., the system is not designed to withstand a hydrogen explosion);

(continued)

CLEAN ITS SPEC

5.5 Programs and Manuals

5.5.9 Ventilation Filter Testing Program (VFTP) (continued)

d. Demonstrate for each of the ESF filter systems that the pressure drop across the combined HEPA filters, the prefilters, and the charcoal adsorbers is ≤ 6 inches of water adjusted to the maximum design flowrate when tested in general conformance with ANSI N510-1975 at the flowrate specified below. Verification of the specified flowrates may be accomplished during the performance of SR 3.7.9.4, SR 3.7.12.3, and SR 3.7.13.5 as applicable. The PTEFS and the FHBEFS filters are shared and as such, will be tested in the FHBEFS mode.

ESF Filter System	Flowrate
Control Room Emergency	≥ 1600, ≤ 2200 cfm
Fuel Handling Building Exhaust	≤ 24,000 cfm
Emergency Core Cooling System and Containment Spray Cubicle Exhaust	≤ 48,000 cfm

5.5.10 Explosive Gas and Storage Tank Radioactivity Monitoring Program

This program provides controls for potentially explosive gas mixtures contained in the waste gas system, the quantity of radioactivity contained in gas decay tanks or fed into the offgas treatment system, and the quantity of radioactivity contained in unprotected outdoor liquid storage tanks. The gaseous radioactivity quantities shall be determined following the methodology in Branch Technical Position (BTP) ETSB 11-5, "Postulated Radioactive Release due to Waste Gas System Leak or Failure." The liquid radwaste quantities shall be determined in accordance with the ODCM.

The program shall include:

a. The limits for concentrations of hydrogen and oxygen in the waste gas system and a surveillance program to ensure the limits are maintained. Such limits shall be appropriate to the system's design criteria (i.e., the system is not designed to withstand a hydrogen explosion);

(continued)

NUREG MARKUPS

5.5 Programs and Manuals

5.5.~~11~~9 Ventilation Filter Testing Program (VFTP) (continued)

TSS 15.6.14.A

INSERT 13A

(14)

b. Demonstrate for each of the ESF systems that an inplace test of the charcoal adsorber shows a penetration and system bypass < [0.05]% when tested in accordance with [Regulatory Guide 1.52, Revision 2, and ASME N510-1989] at the system flowrate specified below [± 10%].

ESF Ventilation System	Flowrate
[ ]	[ ]

TSS 15.6.14.C

c. Demonstrate for each of the ESF systems that a laboratory test of a sample of the charcoal adsorber, when obtained as described in [Regulatory Guide 1.52, Revision 2], shows the methyl iodide penetration less than the value specified below when tested in accordance with [ASTM D3803-1989] at a temperature of ≤ [30°C] and greater than or equal to the relative humidity specified below.

ESF Ventilation System	Penetration	RH
[ ]	[ ]	[ ]

[Reviewer's Note: Allowable penetration = [100% - methyl iodide efficiency for charcoal credited in staff safety evaluation]/(safety factor).

Safety factor = [5] for systems with heaters.
= [7] for systems without heaters.]

TSS 15.6.14.A

d. Demonstrate for each of the ESF systems that the pressure drop across the combined HEPA filters, the prefilters, and the charcoal adsorbers is less than the value specified below when tested in accordance with [Regulatory Guide 1.52,

(continued)

INSERT 13A for Spec. 5.5.9:

b. Demonstrate for each of the ESF filter systems that an inplace test of the charcoal adsorber shows removal capability of ≥ 99.95% of halogenated refrigerant test gas when tested in general conformance with ANSI N510-1975 at the flowrate specified below. Verification of the specified flowrates may be accomplished during the performance of SR 3.7.9.4, and SR 3.7.13.5 as applicable. The charcoal filters are shared by the FHBEFS and PTEFS, and ECCS and CS CEFS systems and as such, will be tested in the FHBEFS alignment.

ESF Filter System	Flowrate
Control Room Emergency	≥ 1600 ≤ 2200 cfm
Fuel Handling Building Exhaust	≤ 24,000 cfm

c. Demonstrate for each of the ESF filter systems that a laboratory test of a sample of the charcoal adsorber, when obtained as described in Regulatory Guide 1.52, Revision 2, shows a removal efficiency of an activated methyl iodide greater than the value specified below when tested in general conformance with ANSI N510-1975 at the temperature and relative humidity greater than or equal to that specified below.

ESF Filter System	Efficiency	Temp.	RH
Control Room Emergency	≥ 99%	≥ 190°F	≥ 70%
Fuel Handling Building Exhaust and Emergency Core Cooling System and Containment Spray Cubicle Exhaust	≥ 95%	≥ 125°F	≥ 95%

d. Demonstrate for each of the ESF filter systems that the pressure drop across the combined HEPA filters, the prefilters, and the charcoal adsorbers is ≤ 6 inches of water adjusted to the maximum design flowrate when tested in general conformance with ANSI N510-1975 at the flowrate specified below.

DOD CHANGES

12. The Zion Inservice Test Program, which was recently approved, does not include any components other than pumps and valves. Supports are not considered dynamic components, and as such, are not addressed by the IST Program. However, supports are included in the "Inservice Inspection (ISI) Program. Requirements associated with ISI are stipulated in 10 CFR 55.55a. Zion Station's ISI Program has previously been approved by the NRC.

13. Zion does not require other than normal monitoring of secondary water chemistry for inhibiting low pressure turbine disc stress corrosion cracking.

14. The requirements for Control Room Emergency filter testing are retained as specified in the CTS. For the charcoal filters associated with the Fuel Handling Building and Auxiliary Building, the values for Efficiency, Temperature and Relative Humidity are retained as specified in the CTS. However, the flowrate value for the Fuel Handling and Auxiliary Building ventilation system has been changed to reflect a value applicable to the individual subsystems which comprise the ESF filter systems based on filter design and based on being within the 6 inches of water pressure drop when measured flow is adjusted to the maximum design flowrate. These subsystems are; "Fuel Handling Building Exhaust", "Emergency Core Cooling System and Containment Spray Cubicle Exhaust" and "Pipe Tunnel Exhaust". These administrative controls have been previously determined to be sufficient to implement the testing requirements. Since the Zion Station design does not include installed flow measuring devices for each of the individual ventilation subsystems, proposed Specification 5.5.9.a, 5.5.9.b and 5.5.9.d have been modified to include a statement that allows subsystem flowrates to be verified during system performance tests required in Specification 3.7.9, 3.7.11, 3.7.12 and 3.7.13 as applicable. Item (e) is not adopted since the systems have no heaters.

15. Editorial clarification of the Diesel Fuel Oil Testing Program is provided to avoid confusion regarding application of the requirements to new oil and stored oil. These clarifications have been previously approved on the BWR/6 conversions to the Improved Technical Specifications.

16. A reference to approved exemptions is provided to allow the current frequency for UFSAR updates to be implemented for TS Bases as well. The exemption is due to the dual unit discussions in the UFSAR. Although no specific evaluation currently exist, the staff has stated in 57 FR 39353 "With respect to the petioner's concern about multiple facilities sharing common a FSAR, licensees will have maximum flexibility for scheduling updates on a case-by-case basis." In anticipation of such a request made by ComED, the proposed specification 5.5.14.d has included the appropriate reference to preclude submittal of a future Licensing Amendment Request. This basis will also apply to the TS Bases since they also will describe both units.

MARK UP OF ITS CHANGE

OI 3.3.3-02, Table 3.3.2-1, Function 1.g, Function 4.e, Note (d)

Note (d) for Function 1.g and Function 4.e of Table 3.3.2-1, Steam Line Pressure Instrument, should be updated to reflect the lead and lag time constants for Zion. The values in the original ITS submittal were generic numbers from NUREG-1431. Following review by NFS and on-site setpoint engineer, the actual Zion numbers of 10 for lead and 1.8 for lag should be referenced in the Note.

Table 3.3.2-1 (page 1 of 5)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Safety Injection					
a. Manual Initiation	1,2,3,4	2	M	SR 3.3.2.6	NA
b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	L	SR 3.3.2.2 SR 3.3.2.3 SR 3.3.2.5	NA
c. Containment Pressure - High	1,2,3	4	B	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≤ 4.7 psig
d. Pressurizer Pressure - Low	1,2,3[(a)]	3	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≥ 1809 psig
e. High Differential Pressure Between Steam Lines (per steam line)	1,2,3	3	B	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≤ 106.6 psig
f. High Steam Flow in Two Steam Lines (per steam line)	1,2,3[(b)]	2	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	(c)
Coincident with T_{avg} - Low Low (per loop)	1,2,3[(b)]	1	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≥ 538.7°F
g. High Steam Flow in Two Steam Lines (per steam line)	1,2,3[(b)]	2	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	(c)
Coincident with Steam Line Pressure - Low (per steam line)	1,2,3[(b)]	1	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≥ 590.3[(d)] psig

(continued)

(a) Above the P-11 (Pressurizer Pressure) interlock.

(b) Above the P-12 (T_{avg} - Low Low) interlock.

(c) Less than or equal to a function defined as ΔP corresponding to 42.02% full steam flow between 0% and 20% turbine load, and then a ΔP increasing linearly to a ΔP corresponding to 110.75% full steam flow at full load.

(d) Time constants used in the lead/lag controller are t_1 ~~≥~~= ~~50~~10 ± .1 seconds and t_2 ~~≥~~= ~~5~~1.8 ± .018 seconds.

Table 3.3.2-1 (page 3 of 5)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. Steam Line Isolation					
a. Manual Initiation (per MSIV and MSIV bypass valve)	$1, 2^{(e)}, 3^{(e)}$	1	M	SR 3.3.2.6	NA
b. Automatic Actuation Logic and Actuation Relays	$1, 2^{(f)}, 3^{(f)}$	2 trains	G	SR 3.3.2.2 SR 3.3.2.3	NA
c. Containment Pressure - High High	$1, 2^{(f)}, 3^{(f)}$	4	C	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≤ 23.5 psig
d. High Steam Flow in Two Steam Lines (per steam line)	$1, 2^{(f)}, 3^{(f)}$	2	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	(c)
Coincident with T_{avg} - Low Low (per loop)	$1, 2^{(f)}, 3^{(f)}$	1	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≥ 538.7°F
e. High Steam Flow in Two Steam Lines (per steam line)	$1, 2^{(f)}, 3^{(f)}$	2	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	(c)
Coincident with Steam Line Pressure - Low (per steam line)	$1, 2^{(f)}, 3^{(f)}$	1	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≥ $590.3^{(d)}$ psig

(continued)

(c) Less than or equal to a function defined as ΔP corresponding to 42.02% full steam flow between 0% and 20% turbine load, and then a ΔP increasing linearly to a ΔP corresponding to 110.75% full steam flow at full load.

(d) Time constants used in the lead/lag controller are t_1 $\cancel{\geq}$= 10$\cancel{50}$± .1 seconds and t_2 $\cancel{\leq}$= 1.8$\cancel{5}$± .018 seconds.

(e) Except for steam lines with their MSIVs and MSIV bypass valves closed and deactivated.

(f) Except when all MSIVs and MSIV bypass valves are closed and deactivated.

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Table 3.3.2-1 (page 1 of 5)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Safety Injection					
a. Manual Initiation	1,2,3,4	2	M	SR 3.3.2.6	NA
b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	L	SR 3.3.2.2 SR 3.3.2.3 SR 3.3.2.5	NA
c. Containment Pressure - High	1,2,3	4	B	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≤ 4.7 psig
d. Pressurizer Pressure - Low	1,2,3(a)	3	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≥ 1809 psig
e. High Differential Pressure Between Steam Lines (per steam line)	1,2,3	3	B	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≤ 106.6 psig
f. High Steam Flow in Two Steam Lines (per steam line)	1,2,3(b)	2	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	(c)
Coincident with T_{avg} - Low Low (per loop)	1,2,3(b)	1	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≥ 538.7°F
g. High Steam Flow in Two Steam Lines (per steam line)	1,2,3(b)	2	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	(c)
Coincident with Steam Line Pressure - Low (per steam line)	1,2,3(b)	1	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≥ 590.3(d) psig

(continued)

(a) Above the P-11 (Pressurizer Pressure) interlock.

(b) Above the P-12 (T_{avg} - Low Low) interlock.

(c) Less than or equal to a function defined as ΔP corresponding to 42.02% full steam flow between 0% and 20% turbine load, and then a ΔP increasing linearly to a ΔP corresponding to 110.75% full steam flow at full load.

(d) Time constants used in the lead/lag controller are t_1 = 10 ± .1 seconds and t_2 = 1.8 ± .018 seconds.

Table 3.3.2-1 (page 3 of 5)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. Steam Line Isolation					
a. Manual Initiation (per MSIV and MSIV bypass valve)	$1, 2^{(e)}, 3^{(e)}$	1	M	SR 3.3.2.6	NA
b. Automatic Actuation Logic and Actuation Relays	$1, 2^{(f)}, 3^{(f)}$	2 trains	G	SR 3.3.2.2 SR 3.3.2.3	NA
c. Containment Pressure - High High	$1, 2^{(f)}, 3^{(f)}$	4	C	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≤ 23.5 psig
d. High Steam Flow in Two Steam Lines (per steam line)	$1, 2^{(f)}, 3^{(f)}$	2	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	(c)
Coincident with T_{avg} - Low Low (per loop)	$1, 2^{(f)}, 3^{(f)}$	1	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≥ 538.7°F
e. High Steam Flow in Two Steam Lines (per steam line)	$1, 2^{(f)}, 3^{(f)}$	2	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	(c)
Coincident with Steam Line Pressure - Low (per steam line)	$1, 2^{(f)}, 3^{(f)}$	1	F	SR 3.3.2.1 SR 3.3.2.4 SR 3.3.2.7	≥ $590.3^{(d)}$ psig

(continued)

(c) Less than or equal to a function defined as ΔP corresponding to 42.02% full steam flow between 0% and 20% turbine load, and then a ΔP increasing linearly to a ΔP corresponding to 110.75% full steam flow at full load.

(d) Time constants used in the lead/lag controller are t_1 = 10± .1 seconds and t_2 = 1.8± .018 seconds.

(e) Except for steam lines with their MSIVs and MSIV bypass valves closed and deactivated.

(f) Except when all MSIVs and MSIV bypass valves are closed and deactivated.

DOC CHANGES

NSHC	NO.	DISCUSSION
	19.	Safety Injection - High Steam Line Flow
M.	a.	The minimum OPERABLE channel requirement has been revised from 3 to 2 per steam line to be consistent with NUREG-1431. Since the new Actions allow continued operation with 1 channel per line inoperable, this format ensures the reliability of the Function for each steam line.
L-1. L-2.	b.	The Required Action has been revised to be consistent with NUREG-1431. The change and justification are the same as described for item 17b of this document.
	20.	Low-Low T_{avg}
A.	a.	The minimum OPERABLE channel requirement has been changed from 3 to 1 per loop. Since the Actions allow continued operation with one channel inoperable this change is administrative in nature.
L-1. L-2.	b.	The Required Action has been revised to be consistent with NUREG-1431. The change and justification are the same as described for item 17b of this document.
	21.	Low Steam Line Pressure
A.	a.	The minimum OPERABLE channel requirement has been changed from 3 to 1 per steam line. Since the Actions allow continued operation with one channel inoperable this change is administrative in nature.
L-1. L-2.	b.	The Required Action has been revised to be consistent with NUREG-1431. The change and justification are the same as described in item 17b of this document.
A.	c.	The time constants for the lead/lag controller reference in NUREG-1431 are generic industry numbers. The Zion-specific setpoints are 10 sec. for lead, and 1.8 sec. for lag. Setpoints have ± 1% established tolerances for instrument channel and setpoint errors.
	22.	High Containment Pressure
A.	a.	The minimum OPERABLE channel requirement has been changed from 3 to 4. Since the Actions allow continued operation with one channel inoperable, this change is administrative in nature.

NSHC NO. DISCUSSION

described for item 17b of this document.

A. c. The time constants for the lead/lag controller reference in NUREG-1431 are generic industry numbers. The Zion-specific setpoints are 10 sec. for lead, and 1.8 sec. for lag. Setpoints have ± 1% established tolerances for instrument channel and setpoint errors.

38. Turbine Trip and FW Isolation

M. a. The Turbine Trip and Feedwater Isolation Function has been added. Appropriate Actions and Surveillance Requirements are included as shown in Insert "A". The SG Water Level High-High Function (P-14) which was listed under CTS Table 3.4-1 Item VI has been relocated to the Turbine Trip and Feedwater Isolation Function. Placing P-14 in this function is appropriate since SG Water Level High High is an actual trip function and not an interlock permissive. Reference to Safety Injection input to Turbine Trip and Feedwater isolation has not been made, due to these functions being directly addressed by the safety injection function itself.

M. b. The change and justification are the same as described for item 17b of this document.

39. Auxiliary Feedwater - Manual

L-1. a. The Manual AF Start Function is eliminated from Table 3.4-1. This manual actuation is not specifically credited in the safety analyses and the deletion is consistent with NUREG-1431. The AF pumps are tested quarterly as part of the Inservice Testing Program System. Each pump start is manually initiated as part of the test. The Frequency of the pump testing in the Inservice Test Program is greater than the Frequency specified for manual actuation testing in the instrument specification. This change eliminates the duplication of testing requirements contained in existing regulations (10 CFR 50.55a) and the Technical Specifications.

40. Auxiliary Feedwater - Automatic

A. a. The title of this Function was changed to more accurately describe the components encompassed by the Function (logic and relays). This is an editorial change consistent with NUREG-1431.

NUREG MARKUPS

Table 3.3.2-1 (page 2 of ~~8~~ 4)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	~~TRIP~~ SETPOINT(a)
1. Safety Injection (continued)						
g. High Steam Flow in Two Steam Lines	1,2,3(~~d~~ b)	2 per steam line	~~E~~ F	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 SR 3.3.2.~~9~~ 7 ~~SR 3.3.2.10~~	(~~f~~ c)	(f)
Coincident with Steam Line Pressure – Low	1,2,3(~~d~~ b)	1 per steam line	~~E~~ F	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 SR 3.3.2.~~9~~ 7 ~~SR 3.3.2.10~~	≥ [~~635~~ 590.3] (~~c~~ d) psig	≥ [675] psig
2. Containment Spray						
a. Manual Initiation	1,2,3,4	~~2 per train, 2 trains~~ 1	~~B~~ m	SR 3.3.2.~~8~~ 6	NA	NA
b. Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	~~C~~ L	SR 3.3.2.2 SR 3.3.2.~~4~~ 3 SR 3.3.2.~~6~~ 5	NA	NA
c. Containment Pressure						
~~High – 3 (High High)~~	1,2,3	4	~~E~~ G	SR 3.3.2.1 SR 3.3.2.~~5~~ 4 SR 3.3.2.~~9~~ 7 ~~SR 3.3.2.10~~	≤ [~~12.31~~ 23.5] psig	≤ [12.05] psig
~~High – 3 (Two Loop Plants)~~	~~1,2,3~~	~~[3] sets of [2]~~	~~E~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5~~ ~~SR 3.3.2.9~~ ~~SR 3.3.2.10~~	~~≤ [12.31] psig~~	≤ [12.05] psig

Plant Design

Plant Design

(continued)

~~(a) Reviewer Note: Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~

d (~~c~~) Time constants used in the lead/lag controller are t_1 ≥ [~~50~~] seconds and t_2 ≤ [~~5~~] seconds. =10 ± .1 =1.8 ± .018 26

b (~~d~~) Above the P-12 (T_{avg} – Low Low) interlock.

~~(e) Less than or equal to a function defined as ΔP corresponding to [44]% full steam flow below [20]% load, and ΔP increasing linearly from [44]% full steam flow at [20]% load to [114]% full steam flow at [100]% load, and ΔP corresponding to [114]% full steam flow above 100% load.~~

c (~~f~~) Less than or equal to a function defined as ΔP corresponding to [~~40~~ 42.02]% full steam flow between [~~0~~ 0]% and [~~20~~ 20]% turbine load and then a ΔP increasing linearly ~~from [40]% steam flow at [20]% load~~ to a ΔP corresponding to [~~110~~ 110.75]% full steam flow at [~~100~~]% full load.

Table 3.3.2-1 (page 4 of 8)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT(a)
4. Steam Line Isolation (continued)						
Plant Design — c. Containment Pressure – High ~~2~~ High	1,2(f), 3(f)	3(4)2	c	SR 3.3.2.1 SR 3.3.2.~~5~~4 SR 3.3.2.~~9~~7 ~~SR 3.3.2.10~~	≤ ~~[6.61]~~ 2.35 psig	≤ [6.35] psig
d. Steam Line Pressure						
~~(1) Low~~	~~1,2(i), 3(b)(i)~~	~~3 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5~~ ~~SR 3.3.2.9~~ ~~SR 3.3.2.10~~	~~≤ [635](c) psig~~	~~≥ [675](c) psig~~
~~(2) Negative Rate – High~~	~~3(g)(i)~~	~~3 per steam line~~	~~D~~	~~SR 3.3.2.1~~ ~~SR 3.3.2.5~~ ~~SR 3.3.2.9~~ ~~SR 3.3.2.10~~	~~≤ [121.6](h) psi/sec~~	~~≤ [110](h) psi/sec~~
d ~~e~~. High Steam Flow in Two Steam Lines	1,2(f), 3(f)	2 per steam line	F	SR 3.3.2.1 SR 3.3.2.~~5~~4 SR 3.3.2.~~9~~7 ~~SR 3.3.2.10~~	(c)	(f)
Coincident with T_{avg} – Low Low	1,2(f), 3(d)(f)	1 per loop	F	SR 3.3.2.1 SR 3.3.2.~~5~~4 SR 3.3.2.~~9~~7 ~~SR 3.3.2.10~~	≥ ~~[550.6]~~ 538.7 °F	≥ [553] °F

(continued)

~~(a) Reviewer Note: Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.~~

a ~~(b)~~ Above the P-11 (Pressurizer Pressure) interlock.

d ~~(c)~~ Time constants used in the lead/lag controller are t_1 ~~≥ [50]~~ seconds = 10 ± .1 and t_2 ~~≤ [5]~~ seconds = 1.5 ± .08.

b ~~(d)~~ Above the P-12 (T_{avg} – Low Low) interlock.

~~(e) Less than or equal to a function defined as ΔP corresponding to [44]% full steam flow below [20]% load, ΔP increasing linearly from [44]% full steam flow at [20]% load to [114]% full steam flow at [100]% load, and ΔP corresponding to [114]% full steam flow above 100% load.~~

c ~~(f)~~ Less than or equal to a function defined as ΔP corresponding to [40]% 42.02 full steam flow between [0]% and [20]% turbine load and then a ΔP increasing linearly ~~from [40]% steam flow at [20]% load~~ to [110]% 110.75 full steam flow at ~~[100]%~~ full load.

NOT USED → ~~(g) Below the P-11 (Pressurizer Pressure) interlock.~~

NOT USED → ~~(h) Time constant utilized in the rate/lag controller is ≤ [50] seconds.~~

f ~~(i)~~ Except when all MSIVs and MSIV bypass valves are closed and ~~[de-activated]~~.

26

DOD CHANGES

CHANGE NUMBER	DISCUSSION

22. Information has been provided which clarifies that only the protective functions with installed bypass capability can be tested in bypass. For Zion Station, the Eagle 21 Process Protection System has installed bypass capability and the instrument functions processed by Eagle 21 can be bypassed.

23. The Slave Relay Testing surveillance, SR 3.3.2.5 has been modified by a note which excludes inoperable actuated equipment and equipment that is locked, sealed, or otherwise secured in its required position. This note is required to preclude failure of this surveillance when the actuated equipment is inoperable or secured in position, as actuation and continuity testing may not be possible in this condition. This change is consistent with Zion Station's current licensing basis (CTS 3.4.3) which requires safeguards instrumentation and control to be operable when the engineered safeguards equipment actuated is required to be operable.

24. Reference to Automatic Actuation Logic and Actuation Relay testing, and Safety Injection input have not been incorporated into the Phase A isolation function on Table 3.3.2-1. Similarly, the Safety Injection input has not been incorporated into Turbine Trip and Feedwater Isolation and Auxiliary Feedwater functions of Table 3.3.2-1. Zion Station's design does not have inputs into a separate logic for these engineered features as a standard design plant does. These engineered features are directly actuated from the Safety Injection signal itself, and as such are directly addressed by the Safety Injection function. The Bases has been written to address this interrelationship. Maintaining reference to the Safety Injection input will create confusion relative to other actuation logics which are tested on differing frequencies.

25. Condition Q. was modified to include an additional condition to enter Required Action Q.1 if one or more interlocks with TWO Channels are inoperable. This is to address the case where a failure of a single interlock channel causes the interlock function to be inoperable. This requires the interlock to be in its required state within one hour. If this cannot be met, Required Actions R.1 and R.2 require plant shutdown, thus all possible failure modes of the interlock functions are addressed.

26. The lead/lag controller constants referenced for the Main Steam Line Pressure instruments associated with Functions 1.g and 4.e of Table 3.3.2-1 have been changed to reflect Zion-specific values. These plant-specific setpoints are different than the generic numbers used in NUREG-1431.

MARK UP OF DOD CHANGE

OI DOD 3.4-01; Clarification of DOD 3.4-04

Reference to recent approval at Vogtle is removed from DOD 3.4-04, and a brief discussion why it is acceptable at Zion has been added.

CHANGE NUMBER | DISCUSSION

4. LCO 3.4.1; RCS Pressure, Temperature, and Flow DNB Limits
SR 3.4.1.4 provides only a confirmation of the reading accuracy from SR 3.4.1.3 which has already identified acceptable flow rate. Since this parameter does not normally change significantly, there is no need to "rush" this item in the first 24 hours of full power operation. Since this Surveillance is a new addition to the Zion Tech Specs, and the 7-day allowance to verify RCS total flow rate is acceptable based on it being a confirmatory check, ~~and the 7 day Frequency has been previously approved for Vogtle,~~ the allowance is deemed acceptable.

5. LCO 3.4.2; RCS Minimum Temperature for Criticality
NUREG Required Action A.1 is revised from "Be in MODE 3" to "Be in MODE 2 with k_{eff} < 1.0 since this action is sufficient to place the unit in condition in which the requirements of the LCO are no longer applicable.

6. LCO 3.4.2; RCS Minimum Temperature for Criticality
The Completion Time for Condition A is revised to 1 hour. The Bases for this item indicate that the time is intended to allow the plant to be placed in MODE 3 in an orderly manner. However, the quickest orderly shutdown to date was not accomplished within 30 minutes (~59 minutes).

7. LCO 3.4.2; RCS Minimum Temperature for Criticality
The Frequency for SR 3.4.2.1 is revised to provide a modified start time since the Note provides specific conditions for applicability of the SR. This type of Frequency prevents an immediate state of noncompliance upon entry into the conditions identified in the Note by providing for a short period of time after entry to conduct the initial performance of the SR. This change is consistent with similar SRs within the NUREG.

8. LCO 3.4.5; RCS Loops - MODE 3
NUREG entry Condition C is revised to omit "and reactor trip breakers closed," since this is not in the LCO. Also, this is redundant to the rest of the entry condition, "Rod Control System capable of withdrawal," since the RCS is not capable of withdrawal unless the reactor trip breakers are closed.

CLEAN DOD

This attachment provides a brief discussion of the more significant deviations from NUREG-1431 that were made to support the development of Zion Station's Improved Technical Specifications. The Change Numbers correspond to the respective deviation shown on the "NUREG MARKUPS". Deviations of lesser significance, which do not require a specific discussion, are annotated in the margin of the affected page. This will include, but is not limited to, deviations such as; typographical errors, grammatical corrections, plant specific nomenclature, and minor format changes. In addition, the NUREG markup also includes the accepted changes to Revision 0 of NUREG-1431 which resulted from the Industry/NRC Lead Plant process. The Industry/NRC changes are identified by their change package number.

CHANGE
NUMBER — DISCUSSION

1. LCO 3.4.1; RCS Pressure, Temperature, and Flow DNB Limits
   LCO 3.4.10; Pressurizer Safety Valves
   LCO 3.4.12; Low Temperature Overpressure Protection (LTOP) System
   LCO 3.4.14; RCS PIV Leakage
   The Applicability NOTE is moved to the LCO section to avoid confusion in the application of SR 3.0.4 for MODE changes (e.g., does entry/exit into/from the Applicability Note constitute a MODE change?)

2. LCO 3.4.1; RCS Pressure, Temperature, and Flow DNB Limits
   The NOTE is revised to clarify that it is meant to apply during the entire transient created by power ramps. These transients often continue for a short period of time beyond the power ramp. This clarification is consistent with current application of this existing note.

3. LCO 3.4.1; RCS Pressure, Temperature, and Flow DNB Limits
   LCO 3.4.7; RCS Loops - MODE 5
   LCO 3.4.12; LTOP System
   LCO 3.4.14; RCS PIV Leakage
   LCO 3.4.18; RCS Isolated Loop Startup
   A Note is added to various NUREG SRs (SR 3.4.1.1, 3.4.12.1, 3.4.12.3, 3.4.14.2, 3.4.14.3, 3.4.18.1 and 3.4.18.2) to indicate that the Surveillance is only required when the identified equipment is necessary for compliance with the LCO. As written in the NUREG, it was possible to fail the SR, but be in compliance with the LCO. This is contrary to SR 3.0.1.

4. LCO 3.4.1; RCS Pressure, Temperature, and Flow DNB Limits
   SR 3.4.1.4 provides only a confirmation of the reading accuracy from SR 3.4.1.3 which has already identified acceptable flow rate. Since this parameter does not normally change significantly, there is no need to "rush" this item in the first 24 hours of full power operation. Since this Surveillance is a new addition to the Zion Tech Specs, and the 7-day allowance to verify RCS total flow rate is acceptable based on it being a confirmatory check, the allowance is deemed acceptable.

MARK UP OF DOC CHANGE

OI 3.2-04; Clarification of DOC 3.6-36, changes in QPTR surveillance requirements when the QPTR alarm is inoperable.

The DOC discussion for changing the SR requirements for an inoperable QPTR alarm have been clarified to discuss the different methods of calculating QPTR and discuss that specifying the instruments enhances the proposed change.

NSHC	NO.	DISCUSSION
L-8.	32.	This requirement has been deleted. The information has been removed because of the subjective limitations provided. The Specification has been replaced with a Condition which requires reduction of reactor power to a Condition in which the Specification does not apply if the appropriate actions are not taken when QPTR is not within limits.
A.	33.	This information has been administratively moved to Applicability requirements for the proposed Specification. This change is consistent with NUREG-1431.
L-9.	34.	This requirement has been deleted. The requirement to shut down if QPTR exceeds 1.09 is no longer applicable since the requirements to reduce reactor power 3% for every 1% by which QPTR exceeds 1.0 when QPTR is greater than 1.02 address limiting the potential effects of quadrant power tilt. This change is consistent with NUREG-1431.
L-10.	35.	The requirement to calculate QPTR once each shift has been revised. Proposed SR 3.2.4.1 will normally require QPTR to be calculated once per 7 days. This Frequency is considered acceptable given the availability of QPTR alarms in the control room.
L-11.	36.	~~This requirement~~CTS requirements 3.2.2.C.2 and 4.2.2.C.2 ~~has~~have been removed and replaced with ~~a~~ Surveillance Requirements 3.2.4.2 and 3.2.4.3, which are performed once every 12 hours when the QPTR alarm is inoperable or when one or more power range channels is inoperable ~~and~~ with THERMAL POWER ~~is~~ ≥ 75% RTP. In addition, QPTR may be determined by core exit thermocouples every hour, if one or more power range neutron flux channels is inoperable with THERMAL POWER ≥ 75% RTP. These Surveillance Requirements ~~allow~~ require the use of excore power range channels, moveable incore detectors, or ~~other means~~ core exit thermocouples. Using this equipment to verify QPTR will provide appropriate monitoring of QPTR limits ~~determine the ratio of the maximum normalized power to the average normalized power in either the top or bottom half of the core. This change assures that the appropriate limits are monitored if~~ when the unit is in operation. Changing the frequency from the 1 hour requirement of CTS 4.2.2.C.2 to 12 hours is a less restrictive change. However, including the moveable incore detectors as a means of determining QPTR in SR 3.2.4.3 in addition to the use of the core exit thermocouples is a safety enhancement that offsets the decreased frequency. The 12 hour Frequency is adequate to detect any relatively slow changes in QPTR, because for those cases of quadrant power tilt that occur quickly (e.g. a dropped rod), there typically are other indications of abnormality that prompt a verification of core power tilt. This change is consistent with NUREG-1431.
L-12.	37.	A Note is added to proposed SR 3.2.4.1 and SR 3.2.4.2 that allows three power range channels to be used for calculating QPTR when one power range channel is inoperable, but only if THERMAL POWER is

CLEAN DOC

NSHC	NO.	DISCUSSION
L-8.	32.	This requirement has been deleted. The information has been removed because of the subjective limitations provided. The Specification has been replaced with a Condition which requires reduction of reactor power to a Condition in which the Specification does not apply if the appropriate actions are not taken when QPTR is not within limits.
A.	33.	This information has been administratively moved to Applicability requirements for the proposed Specification. This change is consistent with NUREG-1431.
L-9.	34.	This requirement has been deleted. The requirement to shut down if QPTR exceeds 1.09 is no longer applicable since the requirements to reduce reactor power 3% for every 1% by which QPTR exceeds 1.0 when QPTR is greater than 1.02 address limiting the potential effects of quadrant power tilt. This change is consistent with NUREG-1431.
L-10.	35.	The requirement to calculate QPTR once each shift has been revised. Proposed SR 3.2.4.1 will normally require QPTR to be calculated once per 7 days. This Frequency is considered acceptable given the availability of QPTR alarms in the control room.
L-11.	36.	CTS requirements 3.2.2.C.2 and 4.2.2.C.2 have been removed and replaced with Surveillance Requirements 3.2.4.2 and 3.2.4.3, which are performed once every 12 hours when the QPTR alarm is inoperable or when one or more power range channels is inoperable with THERMAL POWER $\geq$ 75% RTP. In addition, QPTR may be determined by core exit thermocouples every hour, if one or more power range neutron flux channels is inoperable with THERMAL POWER $\geq$ 75% RTP. These Surveillance Requirements require the use of excore power range channels, moveable incore detectors, or core exit thermocouples. Using this equipment to verify QPTR will provide appropriate monitoring of QPTR limits when the unit is in operation. Changing the frequency from the 1 hour requirement of CTS 4.2.2.C.2 to 12 hours is a less restrictive change. However, including the moveable incore detectors as a means of determining QPTR in SR 3.2.4.3 in addition to the use of the core exit thermocouples is a safety enhancement that offsets the decreased frequency. The 12 hour Frequency is adequate to detect any relatively slow changes in QPTR, because for those cases of quadrant power tilt that occur quickly (e.g. a dropped rod), there typically are other indications of abnormality that prompt a verification of core power tilt. This change is consistent with NUREG-1431.
L-12.	37.	A Note is added to proposed SR 3.2.4.1 and SR 3.2.4.2 that allows three power range channels to be used for calculating QPTR when one power range channel is inoperable, but only if THERMAL POWER is below 75% RTP. With an NIS power range channel inoperable, tilt monitoring for a portion of the reactor core becomes degraded. Large tilts are likely detected with the remaining channels before

MARK UP OF ITS CHANGE

OI 3.7-15, LCO 3.8.1; Page 3.8-4, Modification of Completion Time for Required Action 3.8.1.H.1

The completion time for LCO 3.8.1, Required Action H.1, has been changed from 30 days to 14 days. There was no specific technical justification available to go to a 30 day Completion Time for taking an opposite unit DG out of service.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One offsite feed and one unit-specific or common DG inoperable. <u>OR</u> Two offsite feeds and one unit-specific or common DG inoperable that affect only one division.	-------------NOTE------------ Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems – Operating," when Condition F is entered with no AC power source to any 4160 V ESF bus. -----------------------------	
	F.1 Restore offsite feed(s) to OPERABLE status.	12 hours
	<u>OR</u>	
	F.2 Restore DG to OPERABLE status.	12 hours
G. Two or more unit-specific or common DGs inoperable.	G.1 Restore all but one DG to OPERABLE status.	2 hours
H. One or more required opposite unit DG(s) inoperable.	H.1 Restore opposite unit DG(s) to OPERABLE status.	~~30~~14 days
I. Required Action and associated Completion Time of Condition A, B, C, L, E, F, G, or H not met.	I.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	I.2 Be in MODE 5.	36 hours

(continued)

BASES

ACTIONS (continued)

H.1

Opposite unit diesel generators are required to provide emergency onsite power to the opposite unit Service Water (SW) pumps and components required to be OPERABLE in accordance with LCO 3.7.8 "Service Water System" and LCO 3.8.9 "Distribution Systems - Operating." The diesels are required to provide onsite power in the event of a dual unit loss of offsite power. Required Action H.1 is intended to provide assurance that a dual unit loss of offsite power, during the period that a DG is inoperable, does not result in a complete loss of safety function.

The restoration time for an opposite unit diesel is based on the probability of a loss of offsite power to both units in combination with the need to have sufficient time to perform corrective and preventative diesel maintenance on the opposite unit DG.

I.1 and I.2

If the inoperable AC electric power sources cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

J.1

Condition J corresponds to a level of degradation in which all redundancy in the unit-specific and common 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.

(continued)

CLEAN ITS SPEC

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One offsite feed and one unit-specific or common DG inoperable. OR Two offsite feeds and one unit-specific or common DG inoperable that affect only one division.	-------------NOTE------------ Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating," when Condition F is entered with no AC power source to any 4160 V ESF bus. ------------------------------	
	F.1 Restore offsite feed(s) to OPERABLE status.	12 hours
	OR	
	F.2 Restore DG to OPERABLE status.	12 hours
G. Two or more unit-specific or common DGs inoperable.	G.1 Restore all but one DG to OPERABLE status.	2 hours
H. One or more required opposite unit DG(s) inoperable.	H.1 Restore opposite unit DG(s) to OPERABLE status.	14 days
I. Required Action and associated Completion Time of Condition A, B, C, D, E, F, G, or H not met.	I.1 Be in MODE 3.	6 hours
	AND	
	I.2 Be in MODE 5.	36 hours

(continued)

ACTIONS (continued)

H.1

Opposite unit diesel generators are required to provide emergency onsite power to the opposite unit Service Water (SW) pumps and components required to be OPERABLE in accordance with LCO 3.7.8 "Service Water System" and LCO 3.8.9 "Distribution Systems - Operating." The diesels are required to provide onsite power in the event of a dual unit loss of offsite power. Required Action H.1 is intended to provide assurance that a dual unit loss of offsite power, during the period that a DG is inoperable, does not result in a complete loss of safety function.

The restoration time for an opposite unit diesel is based on the probability of a loss of offsite power to both units in combination with the need to have sufficient time to perform corrective and preventative diesel maintenance on the opposite unit DG.

I.1 and I.2

If the inoperable AC electric power sources cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

J.1

Condition J corresponds to a level of degradation in which all redundancy in the unit-specific and common 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.

(continued)

DOC CHANGES

NSHC NO. DISCUSSION

M. 55. LCOs 3.8.1, 3.8.4, and 3.8.9 have been modified to require standby AC and DC power (diesel generators and DC) for an opposite unit service water pump when credited for an operating unit. The proposed Service Water LCO (3.7.8) will require at least one service water pump from the opposite unit to be operable to address passive failure considerations. Further, LCO 3.7.8 may require more than one opposite unit pump based on system configuration. Current Technical Specification LCO 3.8.7 requires three service water pumps to be operable, and allows one pump from the opposite unit to be shared as long as specific provisions (i.e. cross-tie valves, open, independent AC and DC power) are met and the pump has both standby AC and DC power available. In the current Technical Specifications this is an option, with the ultimate requirement to have three pumps operable. Based on the incorporation of passive failure considerations and recent system flow performance capability modeling, it has been determined that utilization of an opposite unit pump is no longer an option, but is required for system operability. As such, LCOs 3.8.1, 3.8.4, and 3.8.9 have been modified to require AC and DC power for opposite unit service water pumps in order to maintain continuity with the ITS usage rules and definition of operability. LCOs 3.8.1, 3.8.4, and 3.8.9 will require the AC and DC buses associated with required pumps and their associated diesel generators to be operable. Explicitly requiring these opposite unit systems (at least one diesel, DC source, and associated distribution systems) to be operable anytime the unit is in Modes 1, 2, 3, or 4 is an added restriction on plant operation not contained in the current Technical Specifications.

M. 56. Based on the preceding justification provided in DOC 3.8-55, Required Actions have been proposed for the inoperability of: 1) an opposite unit diesel, 2) an opposite unit DC electrical power supply, and 3) an opposite unit AC or DC bus. The inoperability of either the DC electrical power supply or AC and DC buses defaults immediately to declaring the required features inoperable. This will result in entry into the Applicable Conditions and Required Actions for the equipment rendered inoperable. The inoperability of a opposite unit diesel generator has been proposed to be ~~30~~14 days. The operability of the opposite unit diesel generator is based on the need for onsite power in the event of a loss of offsite power. **14 days is acceptable in that there is no loss of SW function during this period, and the level of degradation of the SW system is based on a dual-unit LOOP, not considered a high probability event.** The restoration time for an opposite unit diesel is deterministically based on the probability of a loss of offsite power to both units in combination with the need to have sufficient time to perform corrective and preventative diesel maintenance without the need for a unit shutdown.

NUREG MARKUPS

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
F ~~D~~. One ~~[required]~~ offsite ~~circuit inoperable.~~ feed AND One ~~[required]~~ DG inoperable. unit specific or common (45) OR Two offsite feeds and one DG inoperable that affect only one division. EWR-17 (C7) 3.15.2.H ACT 3.15.2.H ACT	------------NOTE------------ Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems – Operating," when Condition ~~D~~ F is entered with no AC power source to ~~one train.~~ any 4160 V ESF bus. ------------------------------ F ~~D~~.1 Restore ~~[required]~~ offsite ~~circuit~~ feed(s) to OPERABLE status. OR F ~~D~~.2 Restore ~~[required]~~ DG to OPERABLE status.	12 hours 12 hours (5)
G ~~E~~. Two or more ~~[required]~~ DGs inoperable. unit specific or common (45) NEW 3.15.2.C N* ACT	G ~~E~~.1 Restore all but one ~~[required]~~ DG to OPERABLE status.	2 hours (6)

(continued)

(46)

H. One or more required opposite unit DG(s) inoperable	H.1 RESTORE OPPOSITE UNIT DG(S) TO OPERABLE STATUS	14 days

BASES

ACTIONS

~~F.1 (continued)~~

~~(requiring sequencer OPERABILITY) occurring during periods when the sequencer is inoperable is minimal.~~

~~This Condition is preceded by a Note that allows the Condition to be deleted if the unit design is such that any sequencer failure mode will only affect the ability of the associated DG to power its respective safety loads under any conditions. Implicit in this Note is the concept that the Condition must be retained if any sequencer failure mode results in the inability to start all or part of the safety loads when required, regardless of power availability, or results in overloading the offsite power circuit to a safety bus during an event and thereby causes its failure. Also implicit in the Note, is that the Condition is not applicable to any train that does not have a sequencer.~~

[DOC#1]

46 Insert B 14

I ~~G~~.1 and I ~~G~~.2

If the inoperable AC electric power sources cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

J ~~H~~.1

2

Condition J ~~H~~ corresponds to a level of degradation in which all redundancy in the unit-specific and common 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.

(continued)

INSERT B14A

H.1

Opposite unit diesel generators are required to provide emergency onsite power to the opposite unit Service Water (SW) pumps and components required to be OPERABLE in accordance with LCO 3.7.8 "Service Water System" and LCO 3.8.9 "Distribution Systems - Operating." The diesels are required to provide onsite power in the event of a dual unit loss of offsite power. Required Action H.1 is intended to provide assurance that a dual unit loss of offsite power, during the period that a DG is inoperable, does not result in a complete loss of safety function.

The restoration time for an opposite unit diesel is based on the probability of a loss of offsite power to both units in combination with the need to have sufficient time to perform corrective and preventative diesel maintenance on the opposite unit DG.

DOD CHANGES

CHANGE
NUMBER — DISCUSSION

44. (continued)

definition of operability. LCOs 3.8.1, 3.8.4, and 3.8.9 will require the AC and DC buses associated with required pumps and their associated diesel generators to be operable. Explicitly requiring these opposite unit systems (at least one diesel, DC source, and associated distribution systems) to be operable anytime the unit is in Modes 1, 2, 3, or 4 is an added restriction on plant operation not contained in the current Technical Specifications.

45. The modified completion time clock associated with Conditions A, C, and D have been specified as being applicable to the offsite feeds, common diesel generator, and unit-specific diesel generators. This change is necessary based on the proposed completion time for opposite unit diesel generators being ~~30~~ 14 days. As such, the modified completion time cap of 10 days must be exempted from other inoperabilities so that an immediate shutdown will not result for conditions which otherwise would be supportive of a limited restoration time. Similarly, proposed Conditions F and G have been rewritten to be applied to only the unit specific and common diesel generators. This is necessary to limit the application of short duration compensatory actions requiring restoration of equipment based on the inability to cope with a design basis event with or without offsite power.

46. Condition H has been added for an inoperable opposite unit diesel generator. This condition is necessary based on the need to maintain at least one opposite unit service water pump operable in order to cope with postulated active and passive failures within the service water system. Proposed LCO 3.8.9 requires the necessary portions of the AC and DC distribution systems to be operable to support this function, while proposed LCO 3.8.1 will require a diesel generator in support of each required service water pump. As such, in keeping with the philosophy of maintaining Condition and Required Action for all required equipment, Condition H has been proposed for opposite unit diesel generators. This is a new condition, and as such is a more restrictive change.

Condition H would allow the opposite unit DG that is required to support at least one opposite unit service water pump to be out of service for 14 days. It is acceptable for the opposite unit DG to be out of service for this period of time since there is no loss of function for the SW system with only the required opposite unit DG out of service. In addition, 14 days provides operational flexibility to perform preventative maintenance on the DG without the need for a dual unit shutdown.

47. Note 6 has been added to proposed to SR 3.8.1.3. SR 3.8.1.3 requires each diesel generator to be synchronized, loaded, and operated for at least 60 minutes on a 31 day frequency. The proposed note will exclude the need to synchronize and load a required opposite unit diesel generator when that

MARK UP OF DOD CHANGE

OI DOD 3.8-01; Update of DOD 3.8-12

DOD 3.8-12 has been updated to remove the reference to Z2R14, since it adds nothing to the discussion and is no longer upcoming.

CHANGE NUMBER	DISCUSSION

11. NUREG SR 3.8.1.2 & SR 3.8.1.3 Frequency, & Table 3.8.1-1 - The variable DG test Frequency requirements are not included per Generic Letter 94-01. Plant procedures will continue to require the accelerated testing requirements until they are modified in accordance with 10 CFR 50.59 through implementation of the provisions of the maintenance rule for the DGs, including the applicable regulatory guidance which will provide a program to assure DG performance.

12. NUREG SR 3.8.1.2, SR 3.8.1.7, SR 3.8.1.9, SR 3.8.1.11, SR 3.8.1.15, SR 3.8.1.19 - The values of the steady state voltage and frequency limits are not included in the SRs. The voltage limits are dependent on a number of factors including bus loading and cable routing, which may be frequently revised in accordance with various design changes ~~(as in the upcoming refueling outage, Z2R14, Unit 2)~~. However, these values are often not the same for each division, and are difficult to specify unambiguously in each SR. Similarly, frequency limits are dependent on various factors (such as the "droop" setting) specific to each test condition (parallel to the grid). Further, since neither the voltage or frequency values are specified in the current Technical Specifications, the voltage and frequency limits for the AC Sources are proposed to be identified in the Bases. Bus undervoltage setpoints specified in LCO 3.3.5 will continually bound lower voltage limits. Administrative controls have adequately assured the voltage and frequency ranges of the divisions necessary to provide their respective safety functions.

13. Since movement of irradiated fuel assemblies in the fuel handling building can occur with either or both units in MODEs 1, 2, 3, or 4, the Required Actions have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel during MODE 5 or 6 or during CORE ALTERATIONS, LCO 3.0.3 would not specify any required action. If moving irradiated fuel in the fuel handling building in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Therefore, inability to complete the Required Actions within the specified Completion Times would not be sufficient reason to require a reactor shutdown.

14. NUREG SR 3.8.1.5, & SR 3.8.3.5, & SR 3.8.3.6 - The requirement to check for and remove accumulated water and sediment from the fuel oil tanks is not included since failure to perform the SR does not directly indicate that the DG is incapable of performing its safety function. Further this surveillance requirement is not contained in Zion Station's current Technical Specifications, nor does past history indicate a need for it to be including in Zion Station's ITS. This maintenance requirement has been adequately performed under administrative control and is proposed to continue to be administratively controlled.

CLEAN DOD

CHANGE NUMBER | DISCUSSION

11. NUREG SR 3.8.1.2 & SR 3.8.1.3 Frequency, & Table 3.8.1-1 - The variable DG test Frequency requirements are not included per Generic Letter 94-01. Plant procedures will continue to require the accelerated testing requirements until they are modified in accordance with 10 CFR 50.59 through implementation of the provisions of the maintenance rule for the DGs, including the applicable regulatory guidance which will provide a program to assure DG performance.

12. NUREG SR 3.8.1.?, SR 3.8.1.7, SR 3.8.1.9, SR 3.8.1.11, SR 3.8.1.15, SR 3.8.1.19 - The values of the steady state voltage and frequency limits are not included in the SRs. The voltage limits are dependent on a number of factors including bus loading and cable routing, which may be frequently revised in accordance with various design changes. However, these values are often not the same for each division, and are difficult to specify unambiguously in each SR. Similarly, frequency limits are dependent on various factors (such as the "droop" setting) specific to each test condition (parallel to the grid). Further, since neither the voltage or frequency values are specified in the current Technical Specifications, the voltage and frequency limits for the AC Sources are proposed to be identified in the Bases. Bus undervoltage setpoints specified in LCO 3.3.5 will continually bound lower voltage limits. Administrative controls have adequately assured the voltage and frequency ranges of the divisions necessary to provide their respective safety functions.

13. Since movement of irradiated fuel assemblies in the fuel handling building can occur with either or both units in MODEs 1, 2, 3, or 4, the Required Actions have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel during MODE 5 or 6 or during CORE ALTERATIONS, LCO 3.0.3 would not specify any required action. If moving irradiated fuel in the fuel handling building in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Therefore, inability to complete the Required Actions within the specified Completion Times would not be sufficient reason to require a reactor shutdown.

14. NUREG SR 3.8.1.5, & SR 3.8.3.5, & SR 3.8.3.6 - The requirement to check for and remove accumulated water and sediment from the fuel oil tanks is not included since failure to perform the SR does not directly indicate that the DG is incapable of performing its safety function. Further this surveillance requirement is not contained in Zion Station's current Technical Specifications, nor does past history indicate a need for it to be including in Zion Station's ITS. This maintenance requirement has been adequately performed under administrative control and is proposed to continue to be administratively controlled.

MARK UP OF ITS CHANGE

OI 3.3.1/3.3.2; Correct inconsistent treatment of required RTS and ESFAS required interlock channels.

Both ITS 3.3.1 and 3.3.2 contain Required Actions for Interlocks (Table 3.3.1-1, Function 22, Table 3.3.21-1 Function 7.b and 7.c) that require modification to prevent entering a 3.0.3 condition for an inoperable interlock. Certain specific interlocks can have both required trains inoperable with an inoperable input condition. This is acceptable if the required action of verifying the interlock is in the required state is followed. If not, the unit is placed in a MODE where the interlock is not required.

3.3 INSTRUMENTATION

3.3.1 Reactor Trip System (RTS) Instrumentation

LCO 3.3.1 The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

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

1. Separate Condition entry is allowed for each function.

2. Entry into Conditions and Required Actions for an instrument channel made inoperable solely for the performance of required surveillances may be delayed for up to 4 hours provided a second channel associated with the same function is inoperable.

3. Entry into Conditions and Required Actions for an Automatic Trip Logic train, Safety Injection train or Reactor Trip Breaker (RTB) made inoperable solely for the performance of an ACTUATION LOGIC TEST may be delayed for up to 8 hours provided the other train is OPERABLE.

4. Entry into Conditions and Required Actions for an RTB made inoperable solely for maintenance on the undervoltage or shunt trip mechanisms may be delayed for up to 2 hours provided the affected RTB is bypassed and the other RTB is OPERABLE.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more Functions with one Required Channel inoperable.	A.1	Enter the Condition referenced in Table 3.3.1-1 for the channel(s).	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. As required by Required Action A.1 and referenced in Table 3.3.1-1.	B.1	Suspend operations involving positive reactivity additions.	Immediately
	AND		
	B.2	--------NOTE-------- Isolated unborated water source flow paths may be unisolated temporarily under administrative controls. ---------------------	
		Close unborated water source isolation valves.	1 hour
	AND		
	B.3	Perform SR 3.1.1.1.	Once per 12 hours
C. As required by Required Action A.1 and referenced in Table 3.3.1-1.	C.1	Restore train to OPERABLE status.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. As required by Required Action A.1 and referenced in Table 3.3.1-1.	D.1	--------NOTE-------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing or setpoint adjustment of other channels. --------------------- Place channel in trip.	6 hours
E. As required by Required Action A.1 and referenced in Table 3.3.1-1.	E.1	Restore train to OPERABLE status.	6 hours
F. As required by Required Action A.1 and referenced in Table 3.3.1-1.	F.1	Restore channel to OPERABLE status.	48 hours
G. Required Action and associated Completion Time of Condition C, D, E, or F not met.	G.1	Be in MODE 3.	6 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
H. As required by Required Action A.1 and referenced in Table 3.3.1-1.	H.1	Suspend operations involving positive reactivity additions.	Immediately
	AND		
	H.2	Reduce THERMAL POWER to < P-6.	24 hours
I. As required by Required Action A.1 and referenced in Table 3.3.1-1.	I.1	--------NOTE--------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. --------------------- Place channel in trip.	6 hours
J. ---------NOTE--------- Only applicable to Function 16. ---------------------- Required Action and associated Completion Time of Condition I not met.	J.1	Reduce THERMAL POWER to < P-7.	4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
K. ---------NOTE--------- Not applicable to Function 16. --------------------- Required Action and associated Completion Time of Condition I not met.	K.1	Reduce THERMAL POWER to < P-7.	6 hours
L. As required by Required Action A.1 and referenced in Table 3.3.1-1.	L.1	---------NOTE-------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. -------------------- Place channel in trip.	6 hours
M. As required by Required Action A.1 and referenced in Table 3.3.1-1.	M.1	Restore channel to OPERABLE status.	6 hours
N. Required Action and associated Completion Time of Condition L or M not met.	N.1	Reduce THERMAL POWER to < P-8.	4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
O. As required by Required Action A.1 and referenced in Table 3.3.1-1.	O.1	Restore channel or train to OPERABLE status.	48 hours
P. Required Action and associated Completion Time of Condition O not met.	P.1	Open RTBs.	1 hour
Q. As required by Required Action A.1 and referenced in Table 3.3.1-1.	Q.1	Open RTBs.	Immediately
R. As required by Required Action A.1 and referenced in Table 3.3.1-1. OR One or more interlocks with TWO Channels inoperable.	R.1	Verify interlock is in required state for existing unit conditions.	1 hour
S. ---------NOTE--------- Only applicable to Functions 22.a and 22.d. ---------------------- Required Action and associated Completion Time of Condition R not met.	S.1	Be in MODE 3.	6 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
T. ---------NOTE--------- Only applicable to Functions 22.b, 22.c and 22.e. --------------------- Required Action and associated Completion Time of Condition R not met.	T.1	Be in MODE 2.	6 hours
U. ---------NOTE--------- Not applicable to Function 22. --------------------- One or more Functions with two or more Required Channels inoperable.	U.1	Enter LCO 3.0.3.	Immediately

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

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
22. Reactor Trip System Interlocks					
a. Intermediate Range Neutron Flux, P-6	2(d)	2 Trains	R	SR 3.3.1.16	≤ 2.54 E-5 % RTP
b. Low Power Reactor Trips Block, P-7	1	2 Trains	R	SR 3.3.1.5	NA
c. Power Range Neutron Flux, P-8	1	2 Trains	R	SR 3.3.1.5	≤ 30.4% RTP
d. Power Range Neutron Flux, P-10	1,2	2 Trains	R	SR 3.3.1.5	≤ 12.4% RTP
e. Turbine Impulse Pressure, P-13	1	2 Trains	R	SR 3.3.1.6 SR 3.3.1.10	≤ 11.8% turbine load impulse pressure equivalent

(d) Below the P-6 (Intermediate Range Neutron Flux) interlock.

BASES

ACTIONS (continued)

R.1

With one or more RTS interlock trains inoperable the associated interlock must be verified to be in its required state for the existing unit condition within 1 hour. Verifying the interlock status manually accomplishes the interlock's Function. The Completion Time of 1 hour is based on operating experience and the minimum amount of time allowed for manual operator actions. The 1 hour Completion Time is equal to the time allowed by LCO 3.0.3 for preparation of a unit shutdown in the event of a complete loss of an RTS Function.

S.1 and T.1

If the Required Action and associated Completion Time of Condition R is not met, the unit must be placed in a MODE in which the LCO does not apply. For the P-6 and P-10 interlocks this is done by placing the unit in MODE 3 within 6 hours. For the P-7, P-8 and P-13 interlocks this is done by placing the unit in MODE 2 within 6 hours. The Completion Time of 6 hours is reasonable, based on operating experience, to reach the required MODE from full power in an orderly manner and without challenging plant systems. The 6 hour Completion Time is equal to the time allowed by LCO 3.0.3 for completion of shutdown actions in the event of a complete loss of an RTS Function.

U.1

When the number of inoperable channels in a trip function exceed those specified in all related Conditions associated with a trip function, then the automatic capability available to shut down the reactor is significantly reduced, and the unit is outside the safety analysis. Therefore, LCO 3.0.3 must be immediately entered if applicable in the current MODE of operation.

The Condition is modified by a Note which states the Condition is not applicable to the Reactor Trip System Interlocks. Required Action R.1 provides the appropriate required action for one or more required Interlock Trains inoperable. If it cannot be placed in its interlock condition, Required Actions S.1 and T.1 will place the unit

(continued)

BASES

in a Mode where the Condition does not apply. This ensures the interlock function is in its required state within one hour or the plant is shutdown, which is equivalent to Required Action U.1.

(continued)

3.3 INSTRUMENTATION

3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

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

APPLICABILITY: According to Table 3.3.2-1.

ACTIONS

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

1. Separate Condition entry is allowed for each function.

2. Entry into Conditions and Required Actions for an instrument channel made inoperable solely for the performance of required surveillances may be delayed for up to 4 hours provided a second channel associated with the same function is inoperable.

3. Entry into Conditions and Required Actions for an Automatic Actuation Logic train made inoperable solely for the performance of surveillances may be delayed for up to 8 hours during actuation logic testing and master relay testing, and 12 hours during slave relay testing, provided the other train is OPERABLE.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one Required Channel inoperable.	A.1 Enter the Condition referenced in Table 3.3.2-1 for the Required Channel(s).	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. As required by Required Action A.1 and referenced in Table 3.3.2-1.	B.1	--------NOTE-------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. -------------------- Place channel in trip.	 6 hours

(continued)

C. As required by Required Action A.1 and referenced in Table 3.3.2-1.	C.1	--------NOTE-------- One additional channel may be bypassed for up to 4 hours for surveillance testing. -------------------- Place channel in bypass.	 6 hours
D. As required by Required Action A.1 and referenced in Table 3.3.2-1.	D.1	Restore train to OPERABLE status.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition B, C, OR D not met.	E.1 Be in MODE 3. <u>AND</u> E.2 --------NOTE--------- Not applicable to Functions 6.a.2 and 6.~~d~~ c. --------------------- Be in MODE 4.	6 hours 12 hours
F. As required by Required Action A.1 and referenced in Table 3.3.2-1.	F.1 --------NOTE--------- The inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels. --------------------- Place channel in trip.	 6 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
G. As required by Required Action A.1 and referenced in Table 3.3.2-1.	G.1	Restore train to OPERABLE status.	6 hours
H. ---------NOTE--------- Only applicable to Function 1.d. --------------------- Required Action and associated Completion Time of Condition F not met.	H.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	H.2.1	Be in MODE 4.	12 hours
	<u>OR</u>		
	H.2.2	Reduce pressurizer pressure to < P-11.	12 hours
I. ---------NOTE--------- Only applicable to Functions 1.f and 1.g. --------------------- Required Action and associated Completion Time of Condition F not met.	I.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	I.2.1	Be in MODE 4.	12 hours
	<u>OR</u>		
	I.2.2	Reduce T_{avg} to < P-12.	12 hours
J. ---------NOTE--------- Only applicable to Functions 4.b, 4.d and 4.e. --------------------- Required Action and associated Completion Time of Condition F or G not met.	J.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	J.2.1	Be in MODE 4.	12 hours
	<u>OR</u>		
	J.2.2	Close and deactivate all main steam isolation valves and associated bypass valves.	12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
			(continued)
K. ---------NOTE--------- Only applicable to Functions 5.a and 5.b. ---------------------- Required Action and associated Completion Time of Condition F or G not met.	K.1	Be in MODE 3.	6 hours
	AND		
	K.2.1	Be in MODE 4.	12 hours
	OR		
	K.2.2	Close and deactivate, or isolate with a closed manual valve, all main feedwater isolation valves, main feedwater regulating valves, and associated bypass valves.	12 hours
L. As required by Required Action A.1 and referenced in Table 3.3.2-1.	L.1	Restore train to OPERABLE status.	6 hours
M. As required by Required Action A.1 and referenced in Table 3.3.2-1.	M.1	Restore channel or train to OPERABLE status.	48 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
N. ---------NOTE--------- Not applicable to Function 4.a or 7.a. --------------------- Required Action and associated Completion Time of Condition L or M not met.	N.1	Be in MODE 3.	6 hours
	AND		
	N.2	Be in MODE 5.	36 hours
O. ---------NOTE--------- Only applicable to Function 4.a. --------------------- Required Action and associated Completion Time of Condition M not met.	O.1	Be in MODE 3.	6 hours
	AND		
	O.2.1	Be in MODE 4.	12 hours
	OR		
	O.2.2	Close and deactivate the affected main steam isolation valve or affected main steam isolation valve bypass valve on the affected main steam line.	12 hours
P. ---------NOTE--------- Only applicable to Function 7.a. --------------------- Required Action and associated Completion Time of Condition M not met.	P.1	Be in MODE 3.	6 hours
	AND		
	P.2	Be in MODE 4.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
Q. As required by Required Action A.1 and referenced in Table 3.3.2-1. OR One or more interlocks with TWO Channels inoperable.	Q.1	Verify interlock is in required state for existing unit conditions.	1 hour
R. Required Action and associated Completion Time of Condition Q not met.	R.1	Be in MODE 3.	6 hours
	AND		
	R.2	Be in MODE 4.	12 hours
S. ---------NOTE--------- Not applicable to Functions 7.b and 7.c. --------------------- One or more Functions with two or more Required Channels inoperable.	S.1	Enter LCO 3.0.3.	Immediately

Table 3.3.2-1 (page 5 of 5)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
7. ESFAS Interlocks					
a. Reactor Trip, P-4	1,2,3	2 Trains	M	SR 3.3.2.8	NA
b. Pressurizer Pressure, P-11	1,2,3	2 Trains	Q	SR 3.3.2.2	≤ 1921 psig
c. T_{avg} −Low Low, P-12	1,2,3	2 Trains	Q	SR 3.3.2.2	≥ 538.7°F

BASES

ACTIONS

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

power in an orderly manner and without challenging plant systems. In MODE 4, the unit does not have any analyzed transients or conditions that require the explicit use of this protection function.

This Condition is modified by a Note which indicates the Condition is applicable only to the Steam Line Isolation Manual Initiation function.

P.1 and P.2

If the Required Action and associated Completion Time of Condition M are not met for the P-4 interlock, the unit must be placed in MODE 3 within the next 6 hours and in MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power in an orderly manner and without challenging plant systems. In MODE 4, all requirements for OPERABILITY of this interlock are removed.

This Condition is modified by a Note which indicates the Condition is applicable only to the P-4 interlock.

Q.1

With one or more RTS interlock trains inoperable the associated interlock must be verified to be in its required state for the existing unit condition within 1 hour. Verifying the interlock status manually accomplishes the interlock Function. The Completion Time of 1 hour is based on operating experience and the minimum amount of time allowed for manual operator action. The 1 hour Completion Time is equal to the time allowed by LCO 3.0.3 for preparation of a unit shutdown in the event of a complete loss of an RTS Function.

R.1 and R.2

If the Required Action and associated Completion Time of Condition Q are not met for the P-11 and P-12 interlocks, the unit must be placed in MODE 3 within the next 6 hours. In addition, the unit must be placed in a MODE in which the inoperable function is not required within the following

(continued)

BASES

ACTIONS

R.1 and R.2 (continued)

6 hours. This can be accomplished by placing the unit in MODE 4. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems. Placing the unit in MODE 4 removes all requirements for OPERABILITY of these interlocks.

S.1

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

The Condition is modified by a Note which states that the Condition is not applicable to the P-11 and P-12 ESFAS Interlocks. **Required Action Q.1 provides the appropriate required action for one or more required Interlock Trains inoperable. If the plant cannot be placed in its interlock condition, Required Actions R.1 and R.2 will place the unit in a Mode where the condition des not apply. This ensures the interlock function is in its required state within one hour or the plant is shutdown, which is equivalent to Required Action S.1.**

SURVEILLANCE REQUIREMENTS

The SRs for each ESFAS function are identified by the SRs column of Table 3.3.2-1.

A Note has been added to the SR Table to clarify that Table 3.3.2-1 determines which SRs apply to which ESFAS functions.

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

(continued)

NUREG MARKUPS

3.3.1 LCO (continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
O. As required by Required Action A.1 and referenced in Table 3.3.1-1.	O.1 Restore channel or train to OPERABLE status.	48 hours
P. Required Action and associated Completion Time of Condition O not met.	P.1 Open RTBs.	1 hour
Q. As required by Required Action A.1 and referenced in Table 3.3.1-1.	Q.1 Open RTBs.	Immediately
R. As required by Required Action A.1 and referenced in Table 3.3.1-1.	R.1 Verify interlock is in required state for existing unit conditions.	1 hour
S. ---------NOTE--------- Only applicable to Functions 22.a and 22.d. --------------------- Required Action and associated Completion Time of Condition R not met.	S.1 Be in MODE 3.	6 hours

OR

One or more interlocks with TWO channels inoperable.

INSERT "L" (continued)

K.1

If the Required Actions and associated Completion Time of Condition I are not met for Functions other than the Turbine Trip on Low Auto Stop Oil Pressure or Turbine Stop Valve Closure Functions, an additional 6 hours is allowed to reduce THERMAL POWER to below P-7. Allowance of this time interval takes into consideration the redundant capability provided by the remaining redundant OPERABLE channel and the low probability of occurrence of an event during this period that may require the protection afforded by the associated Functions.

The Condition is modified by a Note which states the Condition is not applicable to the Turbine Trip on Low Auto Stop Oil Pressure or Turbine Stop Valve Closure Functions.

INSERT "M"

R.1

With one or more RTS interlock trains inoperable the associated interlock must be verified to be in its required state for the existing unit condition within 1 hour. Verifying the interlock status manually accomplishes the interlock's Function. The Completion Time of 1 hour is based on operating experience and the minimum amount of time allowed for manual operator actions. The 1 hour Completion Time is equal to the time allowed by LCO 3.0.3 for preparation of a unit shutdown in the event of a complete loss of an RTS Function.

S.1 and T.1

If the Required Action and associated Completion Time of Condition R is not met, the unit must be placed in a MODE in which the LCO does not apply. For the P-6 and P-10 interlocks this is done by placing the unit in MODE 3 within 6 hours. For the P-7, P-8 and P-13 interlocks this is done by placing the unit in MODE 2 within 6 hours. The Completion Time of 6 hours is reasonable, based on operating experience, to reach the required MODE from full power in an orderly manner and without challenging plant systems. The 6 hour Completion Time is equal to the time allowed by LCO 3.0.3 for completion of shutdown actions in the event of a complete loss of an RTS Function.

U.1

When the number of inoperable channels in a trip Function exceed those specified in all related Conditions associated with a trip Function, then the automatic capability available to shut down the reactor is significantly reduced, and the unit is outside the safety analysis. Therefore, LCO 3.0.3 must be immediately entered if applicable in the current MODE of operation.

This Condition is modified by a note which states the Condition is not applicable to the Reactor Trip System Interlocks. Required Action R.1 provides the appropriate required action for one or more required Interlock

Trains inoperable. If it cannot be placed in its interlock condition, Required Actions S.1 and T.1 will place the unit in a Mode where the condition does not apply. This ensures the interlock function is in its required state within one hour or the plant is shutdown, which is equivalent to Required Action U.1

ACTIONS (continued)

3.3.2 LCO (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
P. -------NOTE-------- Only applicable to Function 7.a. -------------------- Required Action and associated Completion Time of Condition M not met.	P.1 Be in MODE 3. AND P.2 Be in MODE 4.	6 hours 12 hours
Q. As required by Required Action A.1 and referenced in Table 3.3.2-1.	Q.1 Verify interlock is in required state for existing unit conditions.	1 hour
R. Required Action and associated Completion Time of Condition Q not met.	R.1 Be in MODE 3. AND R.2 Be in MODE 4.	6 hours 12 hours
S. One or more Functions with two or more Required Channels inoperable.	P.1 Enter LCO 3.0.3	Immediately

OR

One or more interlocks with TWO Channels inoperable

P.1 and P.2

If the Required Action and associated Completion Time of Condition M are not met for the P-4 interlock, the unit must be placed in MODE 3 within the next 6 hours and in MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power in an orderly manner and without challenging plant systems. In MODE 4, all requirements for OPERABILITY of this interlock are removed.

This Condition is modified by a Note which indicates the Condition is applicable only to the P-4 interlock. With one RTS interlock train inoperable the associated interlock must be verified to be in its required state for the existing unit condition within 1 hour. Verifying the interlock status manually accomplishes the interlock's Function. The Completion Time of 1 hour is based on operating experience and the minimum amount of time allowed for manual operator action. The 1 hour Completion Time is equal to the time allowed by LCO 3.0.3 for preparation of a unit shutdown in the event of a complete loss of an RTS Function.

Q.1

With one or more RTS interlock trains inoperable the associated interlock must be verified to be in its required state for the existing unit condition within 1 hour. Verifying the interlock status manually accomplishes the interlock Function. The Completion Time of 1 hour is based on operating experience and the minimum amount of time allowed for manual operator action. The 1 hour Completion Time is equal to the time allowed by LCO 3.0.3 for preparation of a unit shutdown in the event of a complete loss of an RTS Function.

R.1 and R.2

If the Required Action and associated Completion Time of Condition Q are not met for the P-11 and P-12 interlocks, the unit must be placed in MODE 3 within the next 6 hours. In addition, the unit must be placed in a MODE in which the inoperable function is not required within the following 6 hours. This can be accomplished by placing the unit in MODE 4. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems. Placing the unit in MODE 4 removes all requirements for OPERABILITY of these interlocks.

S.1

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

The Condition is modified by a Note which states that the Condition is not applicable to the P-11 and P-12 ESFAS Interlocks. Required Action Q.1

provides the appropriate required action for one or more required Interlock Trains inoperable. If the plant cannot be placed in its interlock condition, Require Actions R.1 and R.2 will place the unit in a Mode where the condition does not apply. This ensures the interlock function is in its required state within one hour or the plant is shutdown, which is equivalent to Required Action S.1

INSERT "Y"

The protection functions with installed bypass capability, such as those processed through the Eagle 21 Process Protection System, may be tested in the trip or bypass condition. Except where explicitly permitted (e.g.; Containment Pressure) administrative controls ensure two channels in the instrument protection set are not placed in the bypass condition at the same time when that instrument function is required to be OPERABLE by the Technical Specifications.

DOD CHANGES

CHANGE NUMBER	DISCUSSION
32.	Condition R. was modified to include an additional condition to enter Required Action R.1 if one or more interlocks with TWO Channels are inoperable. This is to address the case where a failure of a single interlock channel causes the interlock function to be inoperable. This requires the interlock to be in its required state within one hour. If this cannot be met, Required Actions S.1 and T.1 will place the unit in a Mode where the condition is no longer applicable, thus all possible failure modes of the interlock functions are addressed.

CHANGE NUMBER	DISCUSSION
22.	Information has been provided which clarifies that only the protective functions with installed bypass capability can be tested in bypass. For Zion Station, the Eagle 21 Process Protection System has installed bypass capability and the instrument functions processed by Eagle 21 can be bypassed.
23.	The Slave Relay Testing surveillance, SR 3.3.2.5 has been modified by a note which excludes inoperable actuated equipment and equipment that is locked, sealed, or otherwise secured in its required position. This note is required to preclude failure of this surveillance when the actuated equipment is inoperable or secured in position, as actuation and continuity testing may not be possible in this condition. This change is consistent with Zion Station's current licensing basis (CTS 3.4.3) which requires safeguards instrumentation and control to be operable when the engineered safeguards equipment actuated is required to be operable.
24.	Reference to Automatic Actuation Logic and Actuation Relay testing, and Safety Injection input have not been incorporated into the Phase A isolation function on Table 3.3.2-1. Similarly, the Safety Injection input has not been incorporated into Turbine Trip and Feedwater Isolation and Auxiliary Feedwater functions of Table 3.3.2-1. Zion Station's design does not have inputs into a separate logic for these engineered features as a standard design plant does. These engineered features are directly actuated from the Safety Injection signal itself, and as such are directly addressed by the Safety Injection function. The Bases has been written to address this interrelationship. Maintaining reference to the Safety Injection input will create confusion relative to other actuation logics which are tested on differing frequencies.
25.	Condition Q. was modified to include an additional condition to enter Required Action Q.1 if one or more interlocks with TWO Channels are inoperable. This is to address the case where a failure of a single interlock channel causes the interlock function to be inoperable. This requires the interlock to be in its required state within one hour. If this cannot be met, Required Actions R.1 and R.2 require plant shutdown, thus all possible failure modes of the interlock functions are addressed.
26.	The lead/lag controller constants referenced for the Main Steam Line Pressure instruments associated with Functions 1.g and 4.e of Table 3.3.2-1 have been changed to reflect Zion-specific values. These plant-specific setpoints are different than the generic numbers used in NUREG-1431.