PACKAGE 3.7

PLANT SYSTEMS

PART C

MARKUP OF PRAIRIE ISLAND CURRENT TECHNICAL SPECIFICATIONS

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PRAIRIE ISLAND NUCLEAR GENERATING PLANT UNITS 1 AND 2

Improved Technical Specifications Conversion Submittal

3.4 STEAM AND POWER CONVERSION SYSTEM

~~Applicability~~ A3.7-01

~~Applies to the operating status of the steam and power conversion system.~~

~~Objective~~ A3.7-01

~~To specify minimum conditions of steam-relieving capacity and auxiliary feed-water supply necessary to assure the capability of removing decay heat from the reactor, and to limit the concentration of activity that might be released by steam relief to the atmosphere.~~

Specification

A. Steam Generator Safety and Power Operated Relief Valves A3.7-02

LCO3.7.1 Applic

1. A reactor shall not be in MODE 1, 2, and 3 ~~made or maintained critical nor shall reactor coolant system average temperature exceed 350°F~~ unless the following conditions are satisfied (except as specified in 3.4.A.2 below):

LCO3.7.1

a. Ten steam generator safety valves shall be OPERABLE with lift settings of 1077, 1093, 1110, 1120 and 1131 psig ±3% except during testing.

LCO3.7.4

b. Both steam generator power-operated relief valves for that reactor are OPERABLE.

LCO3.7.1 Cond A

One steam generator safety valve may be inoperable for 4 hours. L3.7-03

A3.7-04

2. During MODEs 1, 2, and 3 ~~STARTUP OPERATION or POWER OPERATION~~, the following condition of inoperability may exist provided STARTUP OPERATION is discontinued until OPERABILITY is restored. ~~—~~If OPERABILITY is not restored within the time specified, be in at least

LCO3.7.1 Cond B

LCO3.7.4 Cond C

A3.7-05

MODE 3 ~~HOT SHUTDOWN~~ within the next 6 hours and Mode 4 ~~reduce reactor coolant system average temperature below 350°F~~ within 12 ~~the following 6~~ hours.

A3.7-06

LCO3.7.4 Cond A Cond B

a. One steam generator power-operated relief valve may be inoperable for 7 days, two SG PORVs may be inoperable for 24 ~~48~~ hours. L3.7-07

B. Auxiliary Feedwater System

A3.7-02

LCO3.7.5 Applic

1. A reactor shall not be in MODES 1, 2, and 3 ~~made or maintained critical nor shall reactor coolant system average temperature exceed 350°F~~ unless the following conditions are satisfied (except as specified in 3.4.B.2 below):

LCO3.7.5

a. For each ~~single~~ unit in operation, two auxiliary feedwater trains shall be ~~the turbine-driven pump associated with that reactor plus one motor-driven pump are~~ OPERABLE.

M3.7-08

b. ~~For two-unit operation, all four auxiliary feedwater pumps are OPERABLE~~.

A3.7-09

c. ~~Valves and piping associated with the above components are OPERABLE except that during STARTUP OPERATION necessary changes may be made in motor-operated valve position. All such changes shall be under direct administrative control~~.

LCO3.7.5

NOTE: An AFW train may be considered OPERABLE during alignment and operation for steam generator level control if capable of being manually realigned to the AFW mode of operation.

L3.7-11

SR3.7.5.1

NEW SR, verify each month that AFW valves in each water and steam flow path not locked, sealed or otherwise secured in position, are in the correct position.

M3.7-12

LCO3.7.2

NEW Specification requires two MSIVs to be operable. Action statements consistent with NUREG-1431 are included.

M3.7-13

LCO3.7.3

NEW Specification requires two MFRVs and associated bypass valves OPERABLE. Action statements consistent with NUREG-1431 are included.

M3.7-14

SR3.7.3.1
SR3.7.3.2

NEW SRs, verify isolation time for MFRVs and MFRV bypass valves on an actual or simulated actuation signal.

M3.7-15

3.4.B.1.d. A minimum of 100,000 gallons of water per unit is available in the condensate storage tanks ~~and a backup supply of river water is available through the cooling water system~~. M3.7-16

LCO3.7.6 LR3.7-17

e. ~~Motor operated valves MV-32242 and MV-32243 (Unit 2 valves MV-32248 and MV-32249) shall have valve position monitor lights OPERABLE and shall be locked in the open position by having the motor control center supply breakers physically locked in the off position.~~ LR3.7-18

LR3.7-18

f. ~~Manual valves in the above systems that could (if one is improperly positioned) reduce flow below that assumed for accident analysis shall be locked in the proper position for emergency use. During POWER OPERATION, changes in valve position will be under direct administrative control.~~

LR3.7-18

g. ~~The condensate supply cross connect valve C-41-2, to the auxiliary feedwater pumps shall be blocked and tagged open. Any changes in position of this valve shall be under direct administrative control.~~

2. During MODES 1, 2, and 3 ~~STARTUP OPERATION or POWER OPERATION~~, ~~any one of the~~ following conditions of inoperability may exist for each unit provided STARTUP OPERATION is discontinued until OPERABILITY is restored. If OPERABILITY is not restored within the time specified, place the affected unit (or either unit in the case of a motor driven AFW pump inoperability) in MODE 3 ~~at least HOT SHUTDOWN~~ within the next 6 hours and MODE 4 ~~reduce reactor coolant system average temperature below 350°F~~ within 12 ~~the following 6~~ hours. A3.7-04 A3.7-20 A3.7-05

LCO3.7.5 Cond C
LCO3.7.6 Cond B

A3.7-06

LCO3.7.5 Cond A

One steam supply to a turbine driven AFW pump may be inoperable 7 days. L3.7-22

M3.7-23

LCO3.7.5 Cond B

a. A ~~turbine driven~~ AFW train ~~pump, system valves and piping~~ may be inoperable for 72 hours.

SR3.7.5.2 Note

STARTUP OPERATION may continue without completing SRs which demonstrate OPERABILITY of a Turbine Driven AFW Pump and/or associated system valves ~~inoperable based solely on the In-Service testing requirements of TS section 4.2.A.2 and flow verification having not been met, provided all other requirements for operability are satisfied~~. The pump and/or associated system valves not required to ~~must~~ be tested and operable until prior to exceeding 10% reactor power or within 72 hours after ~~from increasing~~ RCS temperature above 350°F. LR3.7-19 A3.7-21

~~b. A motor driven AFW pump, system valves and piping may be inoperable for 72 hours.~~

LR3.7-24

L3.7-25

LCO3.7.6 Cond A

c. The condensate storage tanks may be inoperable for 7 days ~~48 hours~~ provided the cooling water system is available as a backup supply of water to the auxiliary feedwater pumps. Verify within 4 hours that backup supply is available and verify once per 12 hours thereafter.

M3.7-26

SR3.7.6.1

NEW SR: Verify CSTs contain ≥ 100,000 gallons water per unit every 12 hours.

M3.7-27

LR3.7-28

~~d. The backup supply of river water provided by the cooling water system may be inoperable for 48 hours provided a minimum of 100,000 gallons of water is available in the condensate storage tanks.~~

LR3.7-29

~~e. The valve position monitor lights for motor operated valves MV-32242 and MV-32243 (Unit 2 valves MV-32248 and MV-32249) may be inoperable for 72 hours provided the associated valves' positions are verified to be open once each shift.~~

~~3.4.C Steam Exclusion System~~ R3.7-32

~~1. The reactor coolant system average temperature shall not exceed 350°F unless both isolation dampers in each ventilation duct penetrating rooms containing equipment required for a high energy line rupture outside of containment are OPERABLE (except as specified below):~~

~~a. If one of the two redundant steam exclusion dampers is inoperable, the operable redundant damper may remain open for 24 hours. If after 24 hours, the damper remains inoperable, one of the two dampers shall be closed.~~

~~b. The actuation logic for one train of steam exclusion may be inoperable for 24 hours. If after 24 hours, the actuation logic remains inoperable, one of the two dampers shall be closed.~~

~~2. If two redundant steam exclusion dampers or two trains of actuation logic are inoperable, close the associated dampers within 4 hours.~~

A3.7-02

M3.7-30

D. Radiochemistry

LCO3.7.14 A reactor shall not be in MODE 1, 2, 3, and 4 ~~made or maintained critical nor shall reactor coolant system average temperature exceed 350°F~~ unless the specific activity of the secondary coolant system for that reactor is less than or equal to 0.10 uCi/gm DOSE EQUIVALENT I-131.

M3.7-35

LCO3.7.14 Cond A If these conditions cannot be satisfied, ~~within one hour initiate the action necessary to place the unit in HOT SHUTDOWN, and~~

A3.7-05

M3.7-30

be in MODE 3 ~~at least HOT SHUTDOWN~~ within the next 6 hours and MODE 5 ~~reduce reactor system coolant average temperature below 350°F~~ within 36 ~~the following 6~~ hours.

TABLE TS.3.5-2B (Page 3 of 9)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
5. STEAM LINE ISOLATION					
LCO3.7.2 a. Manual	1/Loop	1/Loop	1/Loop	1, 2[c], 3[c]	27
b. Hi-Hi Containment Pressure	3	2	2	1, 2, 3[c]	24
c. Hi-Hi Steam Flow with Safety Injection					
1. Hi-Hi Steam Flow	2/Loop	1 in any Loop	1/Loop	1, 2, 3[c]	29
2. Safety Injection	See Functional Unit 1 above for all Safety Injection initiating functions and requirements.				
d. Hi Steam Flow and 2 of 4 Lo-Lo T_{avg} with Safety Injection:					
1. Hi Steam Flow	2/Loop	1 in any Loop	1/Loop	1, 2, 3[d]	29
2. Lo-Lo T_{avg}	4	2	3	1, 2, 3[d]	24
3. Safety Injection	See Functional Unit 1 above for all Safety Injection initiating functions and requirements.				

L3.7-33

Addressed Elsewhere

(c) Except When both~~either~~ main steam isolation valves are closed ~~is open~~.

A3.7-34

(d) When reactor coolant system average temperature is greater than 520°F and either main steam isolation valve is open.

Addressed Elsewhere

TABLE TS.3.5-2B
~~Page 3 of 9~~
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Action Statements

ACTION 25: With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 6 hours or be in at least HOT SHUTDOWN within the next 6 hours. Operation in HOT SHUTDOWN may proceed provided the main steam isolation valves are closed, if not, be in at least INTERMEDIATE SHUTDOWN within the following 6 hours. However, one channel may be bypassed for up to 8 hours for surveillance testing per Specification 4.1, provided the other channel is OPERABLE.

ACTION 26: With the number of OPERABLE channels one less than the Total Number of Channels, declare the associated auxiliary feedwater pump inoperable and take the action required by specification 3.4.2.

Addressed Elsewhere

ACTION 28: With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 6 hours or be in at least HOT SHUTDOWN within the next 6 hours. However, one channel may be bypassed for up to 8 hours for surveillance testing per Specification 4.1, provided the other channel is OPERABLE.

ACTION 29: With the number of OPERABLE channels less than the Total Number of Channels, operation in the applicable MODE may proceed provided the following conditions are satisfied:

a. The inoperable channel(s) is placed in the tripped condition within 6 hours, and,

b. The Minimum Channels OPERABLE requirement is met; however, one inoperable channel may be bypassed at a time for up to 4 hours for surveillance testing of other channels per Specification 4.

~~ACTION 27:~~ With one MSIV inoperable (due to a manual switch) ~~the number of OPERABLE channels one less than the Total Number of Channels~~, restore the inoperable valve ~~channel~~ to OPERABLE status within ~~48~~ hours or be in at least MODE 2 ~~HOT SHUTDOWN~~ within ~~the next~~ 146 hours and close the associated valve within 22 hours and verify closed once per 7 days.

LCO3.7.2

M3.7-40

~~TABLE TS 3.5-2B~~
~~Page 8 of 9~~
~~Rev 111 8/10/94~~

3.3.C. Component Cooling Water System

1. Single or Two Unit Operation

A3.7-36

A3.7-02

LCO3.7.7 Appl.

a. A reactor shall not be in MODE 1, 2, 3, or 4 ~~made or maintained critical nor shall reactor coolant system average temperature exceed 200°F~~, unless the following conditions are satisfied (except as specified in 3.3.C.1.b below):

M3.7-37

LCO3.7.7

(1) The two component cooling trains ~~pumps assigned to that unit~~ are OPERABLE.

LR3.7-38

~~(2) The two component cooling heat exchangers assigned to that unit are OPERABLE.~~

A3.7-04

A3.7-31

LCO3.7.7 Cond B

b. During MODEs 1, 2, 3, and 4 ~~STARTUP OPERATION or POWER OPERATION~~, ~~any one of~~ the following conditions of inoperability may exist provided startup operation is discontinued until OPERABILITY is restored. If OPERABILITY is not restored within

A3.7-05

the time specified, be in at least MODE 3 ~~HOT SHUTDOWN~~ within the next 6 hours and in MODE 5 ~~COLD SHUTDOWN~~ within ~~the following~~ 36~~30 hours~~.

A3.7-06

M3.7-37

(1) One ~~of the assigned~~ component cooling train ~~pumps~~ may be inoperable for 72 hours.

LR3.7-38

~~(2) One of the assigned component cooling heat exchangers may be inoperable for 72 hours.~~

M3.7-39

SR3.7.7.1

NEW SR, monthly verify each CC valve in the flow path to safety related equipment, that is not locked, sealed or otherwise secured in position, is in the correct position.

~~3.3.C.2. Two-Unit Operation~~

~~a. A second reactor shall not be made or maintained critical nor shall reactor coolant system average temperature exceed 200°F, unless the following conditions are satisfied (except as specified in 3.3.C.2.b below):~~

LR3.7-41

~~(1) Three component cooling pumps are OPERABLE.~~

~~(2) Four component cooling heat exchangers are OPERABLE.~~

~~b. During STARTUP OPERATIONS or POWER OPERATION either one of the following conditions of inoperability may exist provided STARTUP OPERATION is discontinued until operability is restored. If OPERABILITY is not restored within the time specified, place the affected unit(s) in at least HOT SHUTDOWN within the next 6 hours and be in COLD SHUTDOWN within the following 30 hours.~~

~~(1) One of the three component cooling pumps may be inoperable for 72 hours.~~

~~(2) One of the two component cooling heat exchangers associated with each unit may be inoperable for 72 hours.~~

3.3.D. Cooling Water System

A3.7-02

1. A reactor shall not be in MODES 1, 2, 3, and 4 ~~made or maintained critical nor shall reactor coolant system average temperature exceed 200°F~~, unless

LCO3.7.8

M3.7-42

two cooling water system trains are OPERABLE

~~the following conditions are satisfied~~ (except as specified in 3.3.D.2 below).

LR3.7-43

~~a. Four of the five cooling water pumps are OPERABLE, and if one diesel driven cooling water pump is inoperable, then 121 cooling water pump shall be aligned as shown in the table below or apply 3.3.D.2.a. All changes in the valve positions shall be under direct administrative control.~~

~~Inoperable Pump~~	~~Valve Alignment~~	~~Power Supply to Bus 27 (#121 Cooling Water Pump)~~
~~#12 Cooling Water Pump~~	~~MV-32037 or MV-32036 closed; and associated Bkr Locked Off~~	~~Bus 25~~
	~~MV-32034 and MV-32035 open; and both Bkrs Locked Off~~	
~~#22 Cooling Water Pump~~	~~MV-32034 or MV-32035 closed; and the associated Bkr Locked Off~~	~~Bus 26~~
	~~MV-32037 and MV-32036 open; and both Bkrs Locked Off~~	

~~b. Two safeguards traveling screens are OPERABLE.~~

LR3.7-43

~~c. Two cooling water headers are OPERABLE.~~

L3.7-50

d. A fuel oil supply of 19,500~~19,000~~ gallons is available for the diesel-driven cooling water pumps in the interconnected Unit 1 diesel fuel oil storage tanks. If the fuel oil supply is less than 19,500 gallons and more than 17,000 gallons, restore the level within 48 hours. If the level is not restored within 48 hours, or the level is less than 17,000 gallon, immediately declare the diesel driven CI pumps inoperable.

LCO3.7.8

~~Note that the 19,000 gallon requirement is included in the 70,000 gallon total diesel fuel oil requirement of Specification 3.7.A.5 for Unit 1.~~

SR3.7.8.3 New SR 3.7.8.3, stored diesel fuel oil supply greater than 19,500 gallons.

M3.7-60

A3.7-04

3.3.D.2. During MODES 1, 2, 3, and 4 ~~STARTUP OPERATION or POWER OPERATION~~, the following conditions of inoperability may exist provided STARTUP OPERATION is discontinued until OPERABILITY is restored. If OPERABILITY is not restored within the time specified, be in at least

LCO3.7.8 Cond C
LCO3.7.9 Cond D

MODE 3 ~~HOT SHUTDOWN~~ within the next 6 hours and in MODE 5 A3.7-05

~~COLD SHUTDOWN~~ within ~~the following~~ 36~~30~~ hours. A3.7-06

A3.7-44

LCO3.7.8 Cond A

a. No safeguards ~~Two of the five~~ cooling water pump~~s~~ for one train may be OPERABLE ~~inoperable~~ for 7 days with the following stipulation: A3.7-44

~~If the inoperable pumps are any two of these: #12 Cooling Water Pump, #22 Cooling Water Pump, and #121 Cooling Water Pump, the following conditions shall apply:~~

LR3.7-45

~~(1) the engineered safety features associated with the OPERABLE safeguards cooling water pump are OPERABLE; and~~

~~(2) both paths from transmission grid to the unit 4 kV safeguards buses are OPERABLE (applicable to Unit 1 operation only); and~~

(3) this condition of inoperablity (i.e., two safeguards pumps inoperable simultaneously) may not exceed 7 days in any consecutive 30 day period.

LCO3.7.8 Cond B

b. One of the two required cooling water headers may be inoperable for 72 hours provided:

LR3.7-47

~~(1) the diesel-driven pump and the diesel generator associated with safety features on the OPERABLE header are OPERABLE.~~

M3.7-46

(2) verify within 4 hours the ~~horizontal motor-driven pump associated with the OPERABLE header and the~~ vertical motor-driven pump is ~~are~~ OPERABLE. LR3.7-47

SR3.7.8.1

New SR; monthly verify each CL system valve in the flow path servicing safety related equipment, that is not locked, sealed or otherwise secured in position, is in the correct position. NOTE: isolation of CL system flow to individual components does not render the CL system inoperable. M3.7-48

LCO3.7.9 Cond A

c. One of the Safeguards Traveling Screens may be inoperable for 90 days provided a sluice gate connecting the Emergency Bay and the Circ Water Bay is opened within 4 hours (except during periods of testing not to exceed 24 hours). M3.7-49

LCO3.7.9 Cond B

d. Both Safeguards Traveling Screens may be inoperable for 7 days provided a sluice gate connecting the Emergency Bay and the Circ Water Bay is opened within 1 hour. M3.7-51

LCO3.7.9 Cond C

e. The Emergency Cooling Water line from the Mississippi River may be inoperable for 7 days provided that a sluice gate connecting the Emergency Bay and the Circ Water Bay is opened within 1 hour. M3.7-52

SR3.7.9.1

New SR, quarterly verify safeguard travelling screens OPERABLE. M3.7-53

3.7 AUXILIARY ELECTRICAL SYSTEMS

Applicability

Applies to the availability of electrical power for the operation of plant auxiliaries.

Objectives

To define those conditions of electrical power availability necessary to assure safe reactor operation and continuing availability of engineered safeguards.

Specification

A. A reactor shall not be made or maintained critical nor shall reactor coolant system average temperature exceed 200°F unless all of the following requirements are satisfied for the applicable unit (except as specified in 3.7.B below):

1. At least two separate paths from the transmission grid to the unit 4 kV safeguards distribution system each capable of providing adequate power to minimum safety related equipment, shall be OPERABLE.

2. The 4 kV safeguards buses 15 and 16 (Unit 2 buses: 25 and 26) shall be energized.

3. The 480 V safeguards buses 111, 112, 121, and 122 (Unit 2 buses: 211, 212, 221 and 222), and their safeguards motor control centers shall be energized.

4. Reactor protection instrument AC buses shall be energized: 111, 112, 113 and 114 (Unit 2 buses: 211, 212, 213 and 214).

5. The following unit specific conditions apply:

(a) Unit 1: D1 and D2 diesel generators are OPERABLE, and a fuel supply of 51,000 gallons is available for the D1 and D2 diesel generators in the Unit 1 interconnected diesel fuel oil storage tanks.

LCO3.7.8

A ~~total~~ fuel supply of 19,500~~70,000~~ gallons is available for ~~the D1 and D2 diesel generators and~~ the diesel-driven cooling water pumps in the Unit 1 interconnected diesel fuel oil storage tanks. L3.7-50

Addressed Elsewhere

(b) Unit 2: D5 and D6 diesel generators are OPERABLE and a fuel supply of 75,000 gallons is available for D5 and D6 diesel generators in the Unit 2 interconnected diesel fuel oil storage tanks.

~~3.13 CONTROL ROOM AIR TREATMENT SYSTEM~~

~~Applicability~~

~~Applies to the OPERABILITY of the Control Room Special Ventilation System.~~ A3.7-01

~~Objective~~

~~To specify OPERABILITY requirements for the Control Room Special Ventilation System.~~

Specification

LCO3.7.10 A. Control Room Special Ventilation System

1. Both trains of the Control Room Special Ventilation System shall be OPERABLE ~~at all times.~~ in MODES 1, 2, 3, and 4 and during movement of irradiated fuel assemblies. L3.7-54

LCO3.7.10 Cond E

If these conditions cannot be satisfied in MODES 1, 2, 3 and 4 (except as specified in 3.13.A.2 below), ~~within one hour~~ M3.7-55

~~initiate the action necessary to~~ place both units ~~in HOT SHUTDOWN, and be~~ A3.7-05

in at least MODE 3 ~~HOT SHUTDOWN~~ within the next 6 hours and in MODE 5 ~~COLD SHUTDOWN~~

within ~~the following~~ 36~~30~~ A3.7-06

hours and ~~CORE ALTERATIONS/~~ L3.7-56

A3.7-57

LCO3.7.10 Cond D

If these conditions cannot be satisfied during irradiated fuel handling operations (except as specified in 3.13.A.2 below)

irradiated fuel handling operations shall be terminated immediately ~~within two hours~~. M3.7-58

2. With one train of the Control Room Special Ventilation System inoperable, operation in MODE 1, 2, 3, or 4 ~~POWER OPERATION~~ or A3.7-04

LCO3.7.10 Cond A

~~CORE ALTERATIONS/~~irradiated fuel handling operations are permissible only during the succeeding 7 days. L3.7-56

LCO3.7.10 Cond B

If OPERABILITY is not restored within 7 days when operating in MODE 1, 2, 3, or 4, place both units in at A3.7-04

least MODE 3 ~~HOT SHUTDOWN~~ within the next 6 hours and in MODE 5 ~~COLD SHUTDOWN~~ A3.7-05

within ~~the following~~ 36~~30~~ hours A3.7-06

A3.7-57

LCO3.7.10 Cond C

If OPERABILITY is not restored within 7 days when handling irradiated fuel,
~~and CORE ALTERATIONS/~~ irradiated fuel handling operations shall be terminated

L3.7-56

immediately or the OPERABLE CRSVS train shall be placed in the emergency mode ~~within two hours~~.

M3.7-58

LCO3.7.11

NEW Specification, two safeguards chilled water system (SCWS) loops shall be OPERABLE whenever either unit is in MODE 1, 2, 3 or 4 or irradiated fuel is moved. Action Statements are provided as appropriate.

M3.7-59

SR3.7.11.1
SR3.7.11.2

NEW SRs, every 24 months verify each SCWS loop actuates on an actual or simulated actuation signal and verify SCWS components are OPERABLE per IST Program.

M3.7-61

Addressed Elsewhere

~~3.6.D. Containment Purge System~~

~~1. The 36-inch containment purge system double gasketed blind flanges shall be installed whenever the reactor is above COLD SHUTDOWN. The 18-inch containment inservice purge system double gasketed blind flanges shall be installed whenever the reactor is above COLD SHUTDOWN except as noted below.~~

~~2. The inservice purge system may be operated above COLD SHUTDOWN if the following conditions are met:~~

~~a. The debris screens are installed on the supply and exhaust ducts in containment.~~

~~b. The two automatic primary containment isolation valves in each duct that penetrates containment shall satisfactorily pass a local leak rate test prior to use.~~

~~c. The two automatic primary containment isolation valves and the automatic shield building ventilation damper in each duct that penetrates containment shall be OPERABLE, including instruments and controls associated with them.~~

~~d. If an inservice purge system automatic primary containment isolation valve or automatic shield building ventilation damper becomes inoperable, apply the requirements of Specification 3.6.C.3.~~

~~e. The blind flanges (i.e., 42B (53 in Unit 2) and 43A (52 in Unit 2)) shall be reinstalled and satisfactorily pass a local leak rate test, each time after the in-service purge system is used.~~

E. Auxiliary Building Special Ventilation System~~Zone Integrity~~ A3.7-62

LCO3.7.12

1. A reactor shall not be in MODES 1, 2, 3, and 4 ~~made or maintained critical nor shall reactor coolant system average temperature exceed 200°F~~ unless the AUXILIARY BUILDING SPECIAL VENTILATION SYSTEM ~~ZONE INTEGRITY~~ is OPERABLE ~~maintained~~. A3.7-02 A3.7-62

LCO3.7.12 Cond B Cond C

If these conditions cannot be satisfied (except as specified in 3.6.E.2 and 3 below) within 24 hours initiate the actions necessary to place both units in HOT SHUTDOWN, and be in at least MODE 3 ~~HOT SHUTDOWN~~ within the next 6 hours and in MODE 5 ~~COLD SHUTDOWN~~ A3.7-05

within ~~the following~~ 36~~30~~ hours. A3.7-06

~~2. Openings in the Auxiliary Special Ventilation Zone are permitted provided they are under direct administrative control and can be reduced to less than 10 square feet within 6 minutes following an accident.~~

LR3.7-63

~~3. Valves and actuation circuits that isolate the Auxiliary Building Normal Ventilation System following an accident may be inoperable for 7 days provided the ventilation system can be manually isolated within 6 minutes following an accident.~~

3.6.F. Auxiliary Building Special Ventilation System

LCO3.7.12

1. A reactor shall not be in MODE 1, 2, 3 and 4 ~~made or maintained critical nor shall reactor coolant system average temperature exceed 200°F~~ unless both trains of the Auxiliary Building Special Ventilation System are OPERABLE (except as specified in 3.F.2 below). ~~In order for the Auxiliary Building Special Ventilation System to be considered OPERABLE, the Turbine Building roof exhauster fans shall be capable of being deenergized within 30 minutes following a loss-of-coolant accident.~~ A3.7-02 LR3.7-64

LCO3.7.12 Cond A

2. One train of the Auxiliary Building Special Ventilation System may be inoperable for 7 days.

LCO3.7.12 Cond C

If these conditions cannot be satisfied, place both units in MODE 3 within 6 hours and be in MODE 5 within 36 hours. M3.7-65

Addressed Elsewhere

G. Shield Building Integrity

A reactor shall not be made or maintained critical nor shall reactor coolant system average temperature exceed 200°F unless SHIELD BUILDING INTEGRITY is maintained. If these conditions cannot be satisfied, within 24 hours initiate the action necessary to place the unit in HOT SHUTDOWN, and be in at least HOT SHUTDOWN within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

H. Shield Building Ventilation System

1. A reactor shall not be made or maintained critical nor shall reactor coolant system average temperature exceed 200°F unless both trains of the Shield Building Ventilation System are OPERABLE (except as specified in 3.H.2 below).

2. One train of the Shield Building Ventilation System may be inoperable for 7 days.

I. Containment Internal Pressure

1. The internal pressure of the containment vessel shall not exceed 2 psig whenever CONTAINMENT INTEGRITY is required (except as specified in 3.6.I.2 below).

2. If internal pressure exceeds 2 psig and is not corrected within 8 hours, be in at least HOT SHUTDOWN within the next 6 hours and be in COLD SHUTDOWN within the following 30 hours.

R3.7-79

~~3.12 SNUBBERS~~

~~Applicability~~

~~Applies to the OPERABILITY of safety related snubbers.~~

~~Objective~~

~~To define those conditions of snubber OPERABILITY necessary to assure safe reactor operation.~~

~~Specification~~

~~A. Except as permitted below, all safety related snubbers shall be OPERABLE above COLD SHUTDOWN. Snubbers may be inoperable in COLD SHUTDOWN and REFUELING whenever the supported system is not required to be OPERABLE.~~

~~B. With one or more snubbers made or found to be inoperable for any reason when OPERABILITY is required, within 72 hours:~~

~~1. Replace or restore the inoperable snubbers to OPERABLE status and perform an engineering evaluation per Specification 4.13.E on the supported component(s), or~~

~~2. Declare the supported system inoperable and take the action required by the Technical Specifications for inoperability of that system.~~

3.8.B. Fuel Storage ~~Handling Operations~~ A3.7-66

1. During fuel storage ~~handling operations~~ the following conditions shall be satisfied: LCO3.7.16 Appl

LR3.7-67

~~a. Radiation levels in the spent fuel storage pool area shall be monitored continuously during fuel handling operations.~~

LR3.7-68

~~b. Prior to fuel handling operations, fuel-handling cranes shall be load-tested for OPERABILITY of limit switches, interlocks and alarms.~~

LCO3.7.16 c. A minimum boron concentration of 1800 ppm shall be maintained in the spent fuel pool whenever ~~a~~ spent fuel ~~cask containing fuel~~ is located in the spent fuel pool. A3.7-66

2. If any of the conditions in 3.8.B.1, above, cannot be met, suspend all fuel handling operations and initiate the actions necessary to re-establish compliance with the requirements of 3.8.B.1. LCO3.7.16 Cond A

~~3.8.C. Small Spent Fuel Pool Restrictions~~ R3.7-69

~~No more than 45 recently discharged assemblies shall be located in the small pool (pool No. 1).~~

D. Spent Fuel Pool Special Ventilation System

LCO3.7.13 1. Both trains of the Spent Fuel Pool Special Ventilation System shall be OPERABLE during movement of irradiated fuel assemblies in the spent fuel pool enclosure (except as specified in 3.8.D.2 and 3.8.D.3 below).

LCO3.7.13 Cond A 2. With one train of the Spent Fuel Pool Special Ventilation System inoperable, movement of irradiated fuel assemblies in the spent fuel pool enclosure is permissible during the following 7 days~~, provided the redundant train is demonstrated OPERABLE prior to proceeding with the movements~~. L3.7-72

LCO3.7.13 Cond B If OPERABILITY is not restored in 7 days, immediately place the OPERABLE SFPSVS train in operation or suspend movement of irradiated fuel.

LCO3.7.13 Cond C 3. With both trains of the Spent Fuel Pool Special Ventilation System inoperable, suspend movement of irradiated fuel assemblies in the spent fuel pool enclosure immediately. M3.7-73

LCO3.7.13 Actions Note 4. The provisions of specification 3.0.C (ITS LCO 3.0.3) are not applicable. A3.7-74

LCO3.7.15 NEW Specification: immediately suspend movement of irradiated fuel assemblies if the fuel storage pool water level is not ≥ 23 ft over the top of irradiated fuel assemblies seated in the storage racks. M3.7-75

SR3.7.15.1 NEW SR: every 7 days during movement of irradiated fuel assemblies in the fuel storage pool, verify the pool water level is ≥ 23 ft above the top of the fuel assemblies seated in the storage racks. M3.7-76

E. Spent Fuel Assembly ~~Pool~~ Storage A3.7-77

1. Spent Fuel Assembly Storage

LCO3.7.17 a. The combination of initial enrichment, burnup and decay time of each spent fuel assembly stored in the spent fuel pool shall be within the unrestricted range of Figures TS.3.8-1 or TS.3.8-2, as applicable, or fuel assemblies shall be stored in accordance with Specification 5.6.A.1.e.

LCO3.7.17 Cond A b. If the requirements of 3.8.E.1.a are not met, immediately initiate action to move any noncomplying fuel assembly to an acceptable location.

LCO3.7.17 Cond A Note c. The provisions of Specification 3.0.C (ITS LCO 3.0.3) are not applicable. A3.7-74

2. Spent Fuel Storage Pool Boron Concentration A3.7-78

LCO3.7.16 a. The spent fuel storage pool boron concentration shall be ≥ 1,800 ppm when fuel assemblies are stored in the spent fuel pool.

LCO3.7.16 Cond A b. If the spent fuel storage pool boron concentration is not within limit, then immediately:

1. Suspend movement of fuel assemblies in the spent fuel storage pool, and

2. Initiate action to restore spent fuel storage pool boron concentration to within limit.

LCO3.7.16 Cond A Note c. The provisions of Specification 3.0.C (ITS LCO 3.0.3) are not applicable. A3.7-74

LCO3.7.17

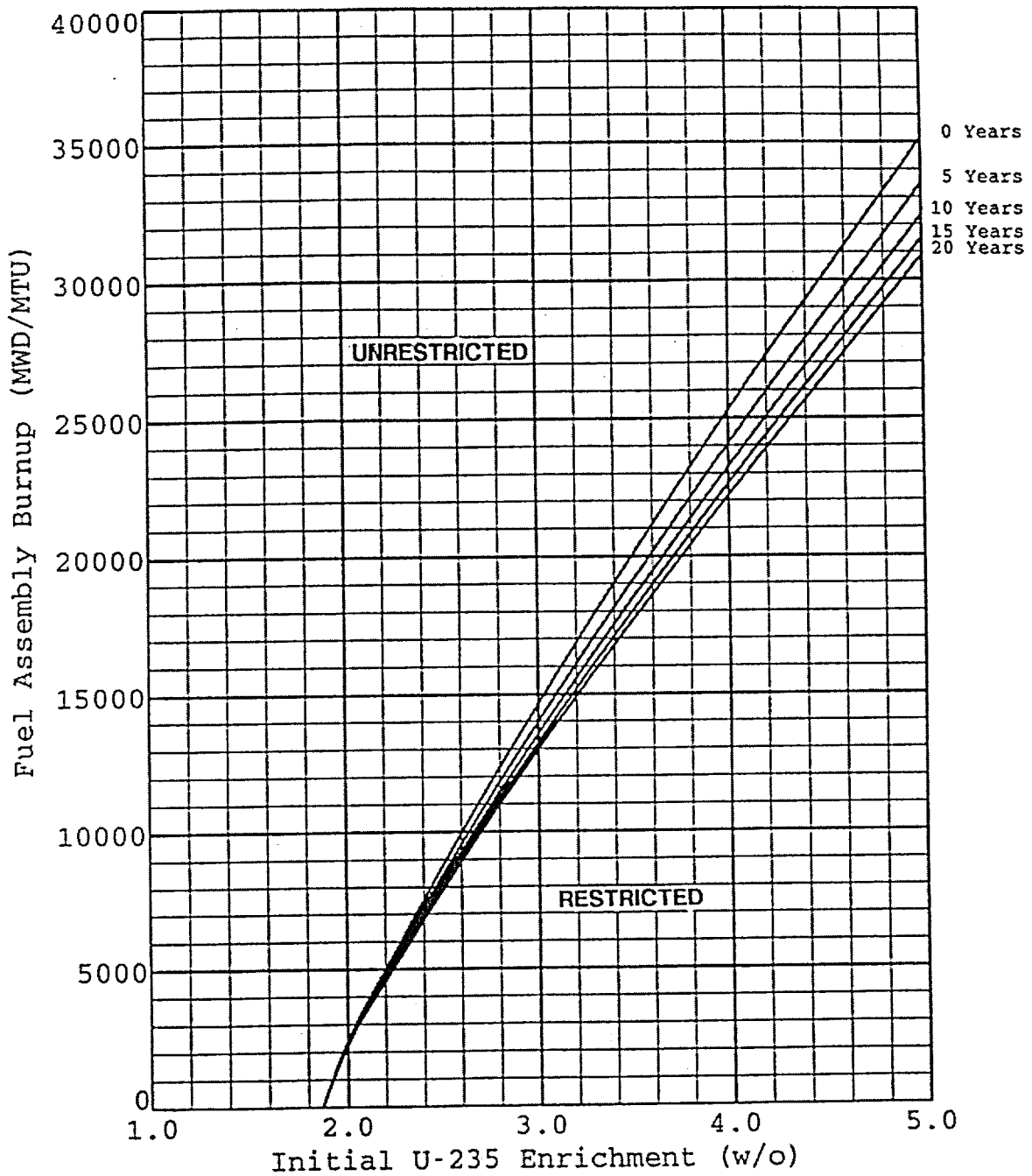

FIGURE ~~TS.3.8-1~~3.7.17-1 Spent Fuel Pool Unrestricted Region Burnup and Decay Time Requirements - OFA Fuel

LCO3.7.17

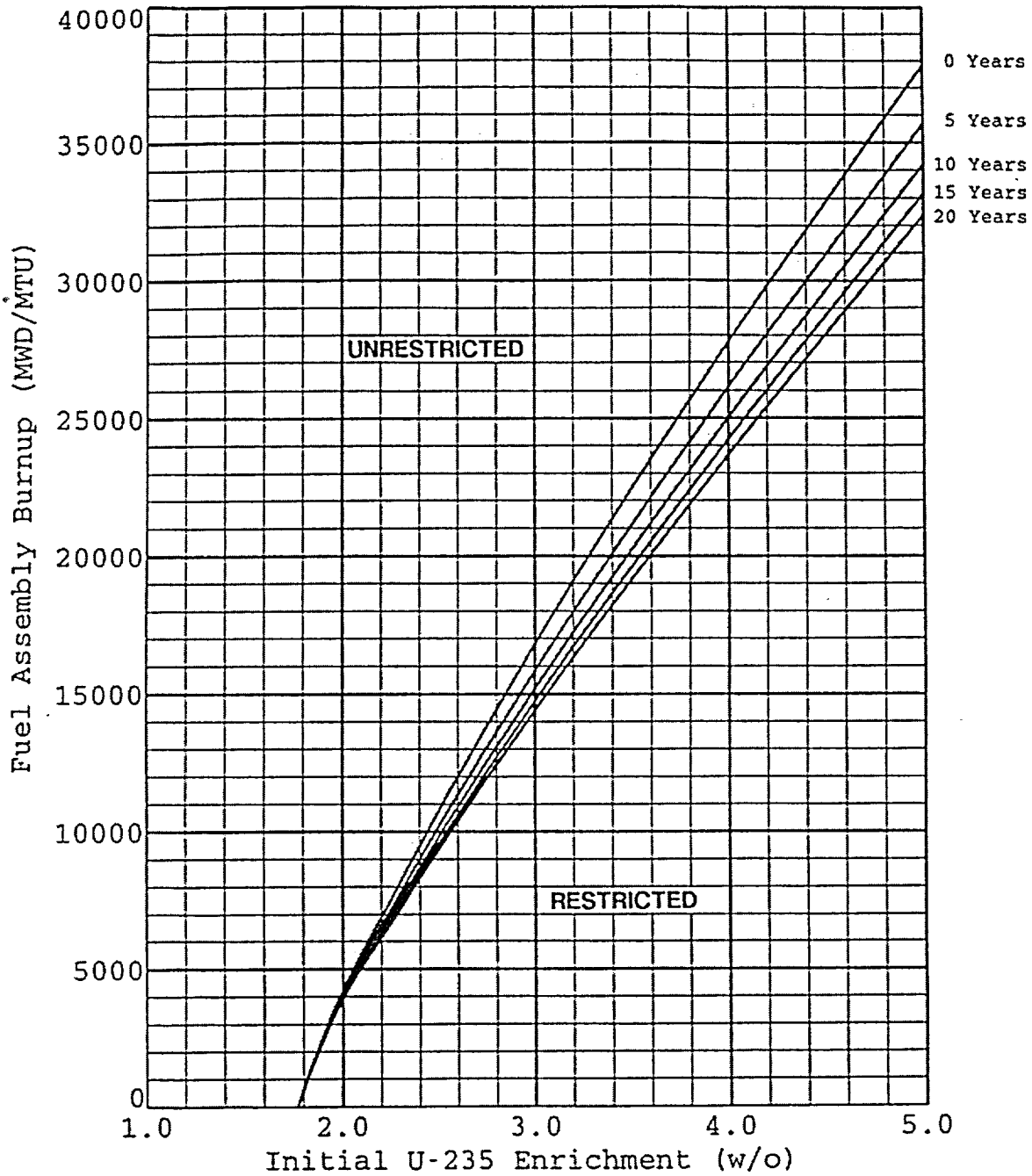

FIGURE ~~TS.3.8-2~~3.7.17-2 Spent Fuel Pool Unrestricted Region Burnup and Decay Time Requirements - STD Fuel

TABLE TS.4.1-1B (Page 3 of 7)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHECK	CALIBRATE	FUNCTIONAL TEST	RESPONSE TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
5. STEAM LINE ISOLATION					
SR3.7.2.1 a. Manual	N.A.	N.A.	Per IST	N.A.	1, 2[23], 3(23)
b. Hi-Hi Containment Pressure	S	R	Q	N.A.	1, 2, 3(23)
c. Hi-Hi Steam Flow with Safety Injection					
1. Hi-Hi Steam Flow	S	R	Q	N.A.	1, 2, 3(23)
2. Safety Injection	See Functional Unit 1 above for all Safety Injection Surveillance Requirements				
d. Hi Steam Flow and 2 of 4 Lo-Lo T_{avg} with Safety Injection					
1. Hi Steam Flow	S	R	Q	N.A.	1, 2, 3(23)
2. Lo-Lo T_{avg}	S	R	Q	N.A.	1, 2, 3(24)
3. Safety Injection	See Functional Unit 1 above for all Safety Injection Surveillance Requirements				
e. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	M(22)	N.A.	1, 2, 3(23)

L3.7-33

LR3.7-82

Addressed Elsewhere

TABLE NOTATIONS

FREQUENCY NOTATION

NOTATION	FREQUENCY
S	Shift
D	Daily
M	Monthly
Q	Quarterly
R	Each Refueling Shutdown
N/A	Not applicable

Addressed Elsewhere

TABLE NOTATION

(20) One manual switch shall be tested at each refueling on a STAGGERED TEST BASIS.

(21) Trip function may be blocked in this MODE below a reactor coolant system pressure of 2000 psig.

(22) Each train shall be tested at least every two months on a STAGGERED TEST BASIS.

Addressed Elsewhere

(26) Whenever CONTAINMENT INTEGRITY is required and either of the containment purge systems are in operation.

(27) Not Used

(28) Not Used

(29) Not Used

LCO3.7.2

(23) Except When both~~either~~ main steam isolation valves are closed~~is open~~.

A3.7-34

(24) When reactor coolant system average temperature is greater than 520°F and either main steam isolation valve is open.

(25) See Table 4.17-2.

Addressed Elsewhere

~~TABLE TS.4.1-1B (Page 7 of 7) REV 111 8/10/94~~

Table TS.4.1-2A (Page 1 of 2)

MINIMUM FREQUENCIES FOR EQUIPMENT TESTS

Equipment	Test	Frequency	Addressed Elsewhere	FSAR Sect. Reference
1. Control Rod Assemblies	Rod Drop Times of full length rods	All rods during each refueling shutdown or following each removal of the reactor vessel head; affected rods following maintenance on or modification to the control rod drive system which could affect performance of those specified rods		7
2. Control Rod Assemblies	Partial movement of all rods	Every Quarter		7
3. Pressurizer Safety Valves	Verify OPERABLE in accordance with the Inservice Testing Program (± 3%). Following testing, lift settings shall be within ±1%	Per ASME Code, Section XI Inservice Testing Program		-
4. Main Steam Safety Valves SR3.7.1.1	Verify each required lift setpoint in accordance with the Inservice Testing Program (± 3%). Following testing, lift settings shall be within ±1%	Per ASME Code, Section XI Inservice Testing Program		-
5. Reactor Cavity	Water Level	Prior to moving fuel assemblies or control rods and at least once every day while the cavity is flooded.		
6. Pressurizer PORV Block Valves	Functional	Quarterly, unless the block valve has been closed per Specification 3.1.A.2.c.(1).(b).2 or 3.1.A.2.c.(1).(b).3.		
7. Pressurizer PORVs	Functional	Every 18 months		

Addressed Elsewhere

~~Table TS.4.1-2A (Page 1 of 2) REV 123 5/21/96~~

Table TS.4.1-2A (Page 2 of 2)

MINIMUM FREQUENCIES FOR EQUIPMENT TESTS

Equipment	Test	Frequency	FSAR Sect. Reference
8. Deleted			
9. Primary System Leakage	Evaluate	Daily	4
10. Deleted			
~~11. Turbine stop valves, governor valves, and intercept valves. (Part of turbine overspeed protection)~~	~~Functional~~	~~Turbine stop valves, governor valves and intercept valves are to be tested at a frequency consistent with the methodology presented in WCAP-11525 "Probabilistic Evaluation of Reduction in Turbine Valve test Frequency", and in accordance with the established NRC acceptance criteria for the probability of a turbine missile ejection incident of 1.0 x 10^{-5} per year. In no case shall the turbine valve test interval exceed one year.~~	

Addressed Elsewhere

LR3.3-81

~~TABLE TS.4.1-2A (Page 2 of 2) REV 123 5/21/96~~

4.7 MAIN STEAM ISOLATION VALVES

~~Applicability~~

~~Applies to periodic testing of the main steam isolation valves.~~

~~Objective~~ A3.7-01

~~To verify the ability of the main steam isolation valves to close upon signal.~~

Specification

SR3.7.2.1 The main steam isolation valves shall be tested in accordance with the Inservice Testing Program ~~during REFUELING~~. LR3.7-82

A closure time of five seconds or less shall be verified.

SR3.7.2.2 Verify every 24 months each MSIV closes on an actual or simulated actuation signal. A3.7-83 L3.7-93

4.8 STEAM AND POWER CONVERSION SYSTEMS

~~Applicability~~

~~Applies to periodic testing requirements of the Auxiliary Feedwater, Steam Generator Power Operated Relief Valves, and Steam Exclusion Systems.~~

~~Objective~~ A3.7-01

~~To verify the OPERABILITY of the steam and power conversion systems required for emergency shutdown cooling of the plant.~~

Specification

A. Auxiliary Feedwater System

1. Each auxiliary feedwater pump* shall be tested in accordance with the Inservice Testing Program ~~started semi-quarterly on a STAGGERED TEST BASIS and full flow to the steam generators shall be demonstrated once every refueling shutdown~~. LR3.7-84 SR3.7.5.2 L3.7-85

~~2. Deleted.~~

~~3. The auxiliary feedwater pumps discharge valves shall be tested by operator action in accordance with Section 4.2.~~ LR3.7-86

~~4. Motor-operated valves required to function during accident conditions shall be tested in accordance with Section 4.2.~~

LR3.7-87

~~5. These tests shall be considered satisfactory if control board indication and subsequent visual observation of the equipment demonstrate that all components have operated properly.~~

L3.7-88

~~6. During POWER OPERATION, for the manual valves outside containment, that could reduce auxiliary feedwater flow, if improperly positioned, to less than assumed in the accident analysis, monthly inspections are required to verify the valves are locked in the proper position required for emergency use.~~

L3.7-89

7. ~~After each COLD SHUTDOWN and prior to exceeding 10% power, a test is required to verify the normal flow path from the primary auxiliary feedwater source to the steam generators. This test may consist of maintaining steam generator level during startup with the auxiliary feed pumps.~~

L3.7-91

8. At least once every 24 ~~18~~ months during shutdown* verify that each pump starts as designed automatically and each automatic valve

SR3.7.5.3
SR3.7.5.4

that is not locked, sealed, or otherwise secured in position in the flow path actuates to its correct position upon receipt of

L3.7-92

an actual or simulated actuation signal ~~each auxiliary feedwater actuation test signal~~.

L3.7-93

SR3.7.5.2
SR3.7.5.4

*If the test for a steam turbine-driven pump comes due during a reactor shutdown, the test shall be performed within 24 hours of entering MODE 1 ~~POWER OPERATION~~.

A3.7-94

4.8.B. Steam Generator Power Operated Relief Valves

SR3.7.4.1 Each steam generator power operated relief valve shall be isolated and tested in accordance with the IST Program ~~monthly~~. L3.7-95

~~C. Steam Exclusion System~~

R3.7-32

~~Isolation dampers in each duct that penetrates rooms containing equipment required for a high energy line rupture outside of containment shall be tested for OPERABILITY once each month.~~

~~In addition, damper mating surfaces shall be examined visually once each year to assure that no physical change has occurred that could affect leakage.~~

R3.7-79

~~4.13 SNUBBERS~~

~~Applicability~~

~~Applies to periodic testing and surveillance requirements of safety related hydraulic snubbers.~~

~~Objective~~

~~To verify the OPERABILITY of hydraulic snubbers.~~

~~Specification~~

~~The following surveillance requirements apply to all safety related snubbers. These requirements augment the inspections required by Section XI of the ASME Code.~~

~~A. As used in this specification, "type of snubber" shall mean snubbers of the same design and manufacturer, irrespective of capacity.~~

~~Snubbers are categorized as "accessible" or "inaccessible" based on their accessibility for inspection during reactor operation. Each of these categories (inaccessible and accessible) may be inspected independently according to the schedule determined by Table TS.4.13.1.~~

~~The visual inspection interval for each type of snubber shall be determined based upon the criteria provided in Table TS.4.13.1.~~

~~B. Visual inspections shall verify that (1) the snubber has no visible indications of damage or impaired OPERABILITY, (2) attachments to the foundation or supporting structure are functional, and (3) fasteners for the attachment of the snubber to the component and to the snubber anchorage are functional. Snubbers which appear inoperable as a result of visual inspections shall be classified as unacceptable and may be reclassified acceptable for the purpose of establishing the next visual inspection interval, provided that:~~

~~a. The cause of the rejection is clearly established and remedied for that particular snubber and for other snubbers irrespective of type that may be generically susceptible; and~~

~~b. The affected snubber is functionally tested in the as-found condition and determined OPERABLE per Specification 4.13.D.~~

~~All hydraulic snubbers found connected to an inoperable common hydraulic fluid reservoir shall be counted as unacceptable for determining the next inspection interval. A review and evaluation shall be performed and documented to justify continued operation with an unacceptable snubber. If continued operation cannot be justified, the snubber shall be declared inoperable and the applicable action statement requirements shall be met.~~

~~C. Except as specified below, functional testing of snubbers shall be conducted at least once per 18 months. Ten percent of the total of each type snubber shall be functionally tested either in place or in a bench test. For each snubber that does not meet the functional test acceptance criteria in Specification 4.13.D below, an additional ten percent of that type of snubber shall be functionally tested until no more failures are found or all snubbers of that type have been tested.~~

~~The representative sample selected for functional testing shall include the various configurations, operating environments, and the range of size and capacity of the snubbers. Twenty-five percent of the sample shall include snubbers from the following three categories.~~

~~a. The first snubber away from a reactor vessel nozzle~~

~~b. Snubbers within five feet of heavy equipment (valve, pump, turbine, motor, etc.)~~

~~c. Snubbers within ten feet of the discharge of a safety/relief valve~~

~~Snubbers identified as "High Radiation Area" or "Difficult to Remove" are exempt from functional testing provided a justifiable basis for exemption is presented for Commission review; snubber life testing is performed to qualify snubber operability for all design conditions; or snubbers of the same type, configuration, and similar service have been tested for a ten year period and no failures have occurred. In such exempt cases, a qualitative test report shall be on file to substitute for the required functional testing.~~

~~In addition to the regular sample and specified re-sampling, snubbers which failed the previous functional test shall be retested during the next test period. If a spare snubber has been installed in place of a failed snubber, then both the failed snubber, if it is repaired and installed in another position, and the spare snubber shall be retested.~~

~~If any snubber selected for functional testing either fails to lockup or fails to move (i.e., frozen in place) the cause shall be evaluated and all snubbers subject to the same defect shall be functionally tested. This testing is in addition to the regular sample and specified re-samples.~~

~~D. Hydraulic snubber functional tests shall verify that:~~

~~a. Activation (restraining action) is achieved within the specified range of velocity or acceleration in both tension and compression.~~

~~b. Snubber bleed, or release rate, where required, is within the specified range in compression or tension. For snubbers specifically required to not displace under continuous load, the ability of the snubber to withstand load without displacement shall be verified.~~

~~E. An engineering evaluation shall be performed for all components supported by inoperable snubbers. The purpose of this engineering evaluation shall be to determine if the components were adversely affected by the inoperable snubber(s) to ensure that the components remain capable of meeting the designed service.~~

~~F. The installation and maintenance records for each snubber shall be reviewed at least once every 18 months to verify that the indicated service life will not be exceeded prior to the next scheduled snubber service life review. If the indicated service life will be exceeded, the snubber service life shall be re-evaluated or the snubber shall be replaced or reconditioned to extend its service life beyond the date of the next scheduled service life review. This re-evaluation, replacement, or reconditioning shall be indicated in the records.~~

~~SNUBBER VISUAL INSPECTION INTERVAL~~

Population or Category (Notes 1 and 2)	Number of Unacceptable Snubbers Column A Extend Interval (Notes 3 and 6)	Column B Repeat Interval (Notes 4 and 6)	Column C Reduce Interval (Notes 5 and 6)
1	0	0	1
80	0	0	2
100	0	1	4
150	0	3	8
200	2	5	13
300	5	12	25
400	8	18	36
500	12	24	48
750	20	40	78
1000 or greater	29	56	109

~~Note 1: The next visual inspection interval for a snubber population or category size shall be determined based upon the previous inspection interval and the number of unacceptable snubbers found during that interval. Snubbers may be categorized, based upon their accessibility during power operation, as accessible or inaccessible. These categories may be examined separately or jointly. However, that decision must be made and documented before any inspection and that decision shall be used as the basis upon which to determine the next inspection interval for that category.~~

~~Note 2: Interpolation between population or category sizes and the number of unacceptable snubbers is permissible. Use next lower integer for the value of the limit for Columns A, B or C if that integer includes a fractional value of unacceptable snubbers as determined by interpolation.~~

~~Note 3: If the number of unacceptable snubbers is equal to or less than the number in Column A, the next inspection interval may be twice the previous interval but not greater than 48 months.~~

~~Note 4: If the number of unacceptable snubbers is equal to or less than the number in Column B but greater than the number in Column A, the next inspection interval shall be the same as the previous interval.~~

~~Note 5: If the number of unacceptable snubbers is equal to or greater than the number in Column C, the next inspection interval shall be two-thirds of the previous interval. However, if the number of unacceptable snubbers is less than the number in Column C but greater than the number in Column B, the next interval shall be reduced proportionally by interpolation, that is, the previous interval shall be reduced by a factor that is one-third of the ratio of the difference between the number of unacceptable snubbers found during the previous interval and the number in Column B to the difference in the numbers in Column B and C.~~

~~Note 6: All inspection intervals up to and including 48 months may be adjusted a maximum of plus or minus 25%.~~

Addressed Elsewhere

3. Containment Fan Coolers

Each fan cooler unit shall be tested during each reactor refueling shutdown to verify proper operation of all essential features including low motor speed, cooling water valves, and normal ventilation system dampers. Individual unit performance will be monitored by observing the terminal temperatures of the fan coil unit and by verifying a cooling water flow rate of greater than or equal to 900 gpm to each fan coil unit.

4.5.A.4. Component Cooling Water System

SR3.7.7.2
SR3.7.7.3

a. System tests shall be performed during each reactor refueling shutdown. Operation of the system will be initiated by an actual or simulated signal to the ~~tripping the~~ actuation instrumentation. Verify each automatic valve in the flow path that is not locked, sealed, or otherwise secured in position actuates to the correct position. Verify each pump starts automatically. L3.7-93 L3.7-92 A3.7-97 LR3.7-98

~~b. The test will be considered satisfactory if control board indication and visual observations indicate that all components have operated satisfactorily.~~

4.5.A.5. Cooling Water System

SR3.7.8.5
SR3.7.8.6

a. System tests shall be performed at each refueling shutdown. Tests shall consist of an automatic start of each diesel engine, automatic start of the vertical motor-driven cooling water pump and automatic operation of valves required to mitigate accidents that are not locked, sealed, or otherwise secured in position L3.7-92

~~including those valves that isolate non-essential equipment from the system~~. Operation of the system will be initiated by an actual or a simulated accident signal to the actuation instrumentation. ~~The tests will be considered satisfactory if control board indication and visual observations indicate that all components have operated satisfactorily and if cooling water flow paths required for accident mitigation have been established.~~ LR3.7-98 L3.7-93 LR3.7-98

~~b. At least once each 18 months, subject each diesel engine to a thorough inspection in accordance with procedures prepared in conjunction with the manufacturer's recommendations for this class of standby service.~~ LR3.7-99

B. Component Tests

1. Pumps

Addressed Elsewhere

~~a. The safety injection pumps, residual heat removal pumps and containment spray pumps shall tested pursuant to Specification 4.2. Acceptable levels of performance shall be that the pumps start and reach their required developed head on minimum recirculation flow and the control board indications and visual observations indicate that the pumps are operating properly for at least 15 minutes.~~

SR3.7.8.2

b. A test consisting of a ~~manually initiated~~ start of each diesel engine, and assumption of load within one minute, shall be conducted monthly. LR3.7-98

LR3.7-98

SR3.7.8.4

c. The vertical motor-driven cooling water pump shall be operated at quarterly intervals. ~~An acceptable level of performance shall be that the pump starts and reaches its required developed head and the control board indications and visual observations indicate that the pump is operating properly for at least 15 minutes.~~

~~2. Containment Fan Motors~~

~~The Containment Fan Coil Units shall be run on low motor speed for at least 15 minutes at intervals of one month. Motor current shall be measured and compared to the nominal current expected for the test conditions.~~

3. Valves

Addressed Elsewhere

~~a. The refueling water storage tank outlet valves shall be tested in accordance with Section 4.2.~~

~~b. The accumulator check valves will be checked for OPERABILITY during each refueling shutdown.~~

~~c. The boric acid tank valves to the Safety Injection System shall be tested in accordance with Section 4.2.~~

~~d. The spray chemical additive tank valves shall be tested in accordance with Section 4.2.~~

SR3.7.8.5

e. Actuation circuits for Cooling Water System valves that isolate non-essential equipment from the system shall be tested each refueling outage. ~~Unit 1 SI actuation circuits for Train A and Train B valves shall be tested during Unit 1 refueling outages. Unit 2 SI actuation circuits for Train A and Train B valves shall be tested during Unit 2 refueling outages.~~ LR3.7-98

Addressed Elsewhere

f. All motor-operated valves in the SIS, RHR, Containment Spray, Cooling Water, and Component Cooling Water System that are designed for operation during the safety injection or recirculation phase of emergency core cooling, shall be tested for OPERABILITY at each refueling shutdown.

SR3.7.7.2

SR3.7.8.5

4.14 CONTROL ROOM SPECIAL VENTILATION ~~AIR TREATMENT~~ SYSTEM TESTS

~~Applicability~~

~~Applies to the periodic testing requirements for the Control Room Special Ventilation System.~~

A3.7-01

~~Objective~~

~~To specify tests for assuring the OPERABILITY of the Control Room Special Ventilation System.~~

Specification

A. At least once per operating cycle (24 months) ~~or once every 18 months, whichever occurs first,~~ the following shall be demonstrated: L3.7-101

~~1. The pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches of water at system design flow rate (±10%).~~ LR3.7-102

SR3.7.10.3 2. Automatic initiation of the Control Room Special Ventilation System shall be demonstrated with an actual or a simulated ~~high radiation or Safety Injection~~ signal. L3.7-93

B. 1. The following tests shall be performed in accordance with the VETP ~~at least once per operating cycle~~ LR3.7-102

SR3.7.10.2

~~or once every 18 months whichever occurs first, or after every 720 hours of system operation or following painting, fire or chemical release in any ventilation zone communicating with the system that could contaminate the HEPA filters or charcoal adsorbers.~~ LR3.7-102

~~a. The results of in-place DOP and halogenated hydrocarbon tests at design flows on HEPA filters and charcoal adsorber banks respectively shall show ≥99% DOP removal for particles having a mean diameter of 0.7 microns and ≥99% halogenated hydrocarbon removal.~~

~~b. The results of laboratory carbon sample analysis shall show ≥90% radioactive methyl iodide removal efficiency (130°C, 95% RH).~~

SR3.7.10.4 c. At least once per operating cycle (24 months) on a staggered test basis L3.7-103

Fans shall be shown to operate within ±10% of 4000 cfm.

~~2. Cold DOP testing shall be performed after each complete or partial replacement of a HEPA filter bank or after any structural maintenance on the system housing that could effect the HEPA bank bypass leakage.~~

LR3.7-102

~~3. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of a charcoal adsorber bank or after any structural maintenance on the system housing that could affect the charcoal adsorber bank bypass leakage.~~

SR3.7.10.1 4. Each train ~~circuit~~ shall be operated at least 15 minutes every month.

M3.7-104

B. Emergency Charcoal Filter Systems

Addressed Elsewhere

1. Periodic tests of the Shield Building Ventilation System shall be performed monthly to demonstrate OPERABILITY. Each redundant train shall be initiated from the control room and determined to be OPERABLE at the time of its periodic test if it meets drawdown performance computed for the test conditions with 75% of the shield building in leakage specified in Figure TS 4.4-1 after initiation and achieve a pressure -2.0 inches of water gage.

2. SR3.7.12.3 Periodic test of the Auxiliary Building Special Ventilation System shall be performed at approximately quarterly intervals to demonstrate its OPERABILITY. Each redundant train shall be ~~initiated from the control room and~~ determined to be OPERABLE at the time of periodic test if it ~~isolates the normal ventilation system and~~ produces a measurable negative pressure ~~in the ABSVZ~~ within 6 minutes after initiation. LR3.7-98

LR3.7-102

3. SR3.7.12.2 In accordance with VFTP ~~At least once per operating cycle, or once each 18 months, whichever comes first,~~ tests of the filter units in

a. the Shield Building Ventilation System and the Auxiliary Building Special Ventilation System shall be performed ~~as indicated below~~: Addressed Elsewhere

~~a. The pressure drop across the combined HEPA filters and charcoal adsorbers shall be demonstrated to be less 6 inches of water at system design flow rate (±10%).~~

LR3.7-102

~~b. The inlet heaters and associated controls for each train shall be determined to be OPERABLE.~~

L3.7-101

c. SR3.7.12.4 At least once per operating cycle (24 months) Verify that each train of each ventilation system automatically starts on an actual or a simulated signal. L3.7-93

~~of safety injection and high radiation (Auxiliary Building Special Ventilation only).~~

LR3.7-98

LR3.7-100

~~TS4.4-2~~
~~Overflow~~

4. a. The tests listed below shall be performed

SR3.7.12.2

in accordance with VFTP ~~at least once per operating cycle, or once every 18 months whichever occurs first, or after every 720 hours of system operation or following painting, fire or chemical release in any ventilation zone communicating with the system that could contaminate the HEPA filters or charcoal adsorbers.~~ LR3.7-102

~~(1) In-place DOP and halogenated hydrocarbons tests at design flows on HEPA filters and charcoal adsorbers banks respectively shall show ≥99% DOP removal for particles having a mean diameter of 0.7 microns and ≥99% halogenated hydrocarbons removal.~~

~~(2) Laboratory carbon sample analysis shall show ≥90% radioactive methyl iodide removal efficiency (130°C, 95% RH).~~

~~b. Cold DOP testing shall be performed after each complete or partial replacement of a HEPA filter bank or after any structural maintenance on the system housing that could affect the HEPA bank bypass leakage.~~

LR3.7-102

~~c. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of a charcoal adsorber bank or after any structural maintenance on the system housing that could affect the charcoal adsorber bank bypass leakage.~~

M3.7-104

SR3.7.12.1 d. Each train ~~circuit~~ shall be operated with the heaters on at least 10 hours every month.

5. Perform an air distribution test on the HEPA filter bank

SR3.7.12.2 in accordance with VFTP ~~after any maintenance or testing that could affect the air distribution within the systems. The test shall be performed at rated flow rate (±10%). The results of the test shall show the air distribution is uniform within ±20%.~~

LR3.7-102

Addressed Elsewhere

C. Containment Vacuum Breakers

The air-operated valve in each vent line shall be tested at quarterly intervals to demonstrate that a simulated containment vacuum of 0.5 psi will open the valve and a simulated accident signal will close the valve. The check valves as well as the butterfly valves will be leak-tested in accordance with the requirements of Specification 4.4.A.3.

E. Containment Isolation Valves

Addressed Elsewhere

SR3.7.12.4 During each refueling shutdown, ~~the containment isolation valves, shield building ventilation valves, and~~

SR3.7.12.4 the auxiliary building normal ventilation system isolation valves shall be tested for operability by applying a actual or simulated accident signal to them.

A3.7-105

L3.7-93

Addressed Elsewhere

~~F. Post Accident Containment Ventilation System~~

~~During each refueling shutdown, the operability of system recirculating fans and valves, including actuation and indication, shall be demonstrated.~~

~~G. Containment and Shield Building Air Temperature~~

~~Prior to establishing reactor conditions requiring containment integrity, the average air temperature difference between the containment and its associated Shield Building shall be verified to be within acceptable limits.~~

~~H. Containment Shell Temperature~~

~~Prior to establishing reactor conditions requiring containment integrity, the temperature of the containment vessel wall shall be verified to be within acceptable limits.~~

~~I. Electric Hydrogen Recombiners~~

~~Each hydrogen recombiner train shall be demonstrated Operable at least once each refueling interval by:~~

~~a. Verifying during a recombiner system functional test that the minimum heater sheath temperature increases to greater than or equal to 700°F within 90 minutes. Upon reaching 700°F, increase the power setting to maximum power for 2 minutes and verify that the power meter reads greater than or equal to 60kw.~~

~~b. Verifying through a visual examination that there is no evidence of abnormal conditions within the recombiner enclosures (i.e., loose wiring or structural connections, deposits of foreign materials, etc.), and~~

~~c. Verifying the integrity of all heater electrical circuits by performing a resistance to ground test. The resistance to ground for any heater phase shall be greater than or equal to 10,000 ohms.~~

4.15 SPENT FUEL POOL SPECIAL VENTILATION SYSTEM

~~Applicability~~

~~Applies to the periodic testing requirements for the Spent Fuel Pool Special Ventilation System (SFPSVS).~~ A3.7-01

~~Objective~~

~~To specify tests for assuring the OPERABILITY of the Spent Fuel Pool Special Ventilation System.~~

Specification

A. At least once per operating cycle (24 months) ~~or once every 18 months, whichever occurs first,~~ the following shall be demonstrated: L3.7-101

~~1. The pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 6 inches of water at system design flow rate (±10%).~~ LR3.7-102

SR3.7.13.3 2. Automatic initiation of each train shall be demonstrated with an actual or a simulated ~~high radiation~~ signal. L3.7-93

B. 1. The following tests shall be performed

SR3.7.13.2 in accordance with the VFTP. ~~at least once per operating cycle~~ LR3.7-102

~~, or once every 18 months whichever occurs first, or after every 720 hours of system operation or following painting, fire or chemical release in any ventilation zone communicating with the system that could contaminate the HEPA filters or charcoal adsorbers.~~ LR3.7-102

~~a. The results of in-place DOP and halogenated hydrocarbon tests at design flows on HEPA filters and charcoal adsorber banks respectively shall show ≥99% DOP removal for particles having a mean diameter of 0.7 microns and ≥99% halogenated hydrocarbon removal.~~

~~b. The results of laboratory carbon sample analysis shall show ≥90% radioactive methyl iodide removal efficiency (130°C, 95% RH).~~

SR3.7.13.4 c. At least once per operating cycle (24 months) on a staggered test basis L3.7-103

The Spent Fuel Pool Special Ventilation System fans shall operate within ±10% of 5200 cfm per train.

~~TS 4.15-1~~
~~Overflow~~

~~2. Cold DOP testing shall be performed after each complete or partial replacement of a HEPA filter bank or after any structural maintenance on the system housing that could affect the HEPA bank bypass leakage.~~ LR3.7-102

~~3. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of a charcoal adsorber bank or after any structural maintenance on the system housing that could affect the charcoal adsorber bank bypass leakage.~~

SR3.7.13.1 4. Each train ~~circuit~~ shall be operated with the heaters on at least 10 hours every month. M3.7-104

TABLE TS.4.1-2B

MINIMUM FREQUENCIES FOR SAMPLING TESTS

TEST	FREQUENCY
1. RCS Gross Activity Determination	5/Week
2. RCS Isotopic Analysis for DOSE EQUIVALENT I-131 Concentration	1/14 days (when at power)
3. RCS Radiochemistry $\bar{E}$ determination	1/6 months(1) (when at power)
4. RCS Isotopic Analysis for Iodine Including I-131, I-133, and I-135	a) Once per 4 hours, whenever the specific activity exceeds 1.0 uCi/gram DOSE EQUIVALENT I-131 or 100/$\bar{E}$ uCi/gram (at or above cold shutdown), and b) One sample between 2 and 6 hours following THERMAL POWER change exceeding 15 percent of the RATED THERMAL POWER within a one hour period (above hot shutdown)
5. RCS Radiochemistry (2)	Monthly
6. RCS Tritium Activity	Weekly
7. Deleted	
8. RCS Boron Concentration (3)	2/Week (4)
9. RWST Boron Concentration	Weekly
10. Boric Acid Tanks Boron Concentration	2/Week
11. Caustic Standpipe NaOH Concentration	Monthly
12. Accumulator Boron Concentration	Monthly
SR3.7.16.1 13. ~~Spent~~ Fuel Storage Pool ~~Pit~~ Boron Concentration	Weekly

Addressed Elsewhere

A3.7-78

* Required at all times

TABLE TS.4.1-2B

MINIMUM FREQUENCIES FOR SAMPLING TESTS

TEST	FREQUENCY	
~~14. Secondary Coolant Gross Beta-Gamma activity~~	~~Weekly~~	LR3.7-112
SR3.7.14.1 15. Secondary Coolant Isotopic Analysis for DOSE EQUIVALENT I-131 concentration	31 days~~1/6 months (5)~~	M3.7-108
~~16. Secondary Coolant Chemistry~~		LR3.7-112
~~pH~~	~~5/week (6)~~	
~~pH Control Additive~~	~~5/week (6)~~	
~~Sodium~~	~~5/week (6)~~	

Addressed Elsewhere

~~Notes:~~

~~1. Sample to be taken after a minimum of 2 EFPD and 20 days of POWER OPERATION have elapsed since reactor was last subcritical for 48 hours or longer.~~

~~2. To determine activity of corrosion products having a half-life greater than 30 minutes.~~

~~3. During REFUELING, the boron concentration shall be verified by chemical analysis daily.~~

~~4. The maximum interval between analyses shall not exceed 5 days.~~

~~5. If activity of the samples is greater than 10% of the limit in Specification 3.4.D, the frequency shall be once per month.~~ M3.7-108

~~6. The maximum interval between analyses shall not exceed 3 days.~~ LR3.7-112

R3.7-106

~~4.19 Auxiliary Building Crane Lifting Devices~~

~~Applicability~~

~~Applies to surveillance requirements for the auxiliary building crane special lifting devices and slings before handling heavy loads carried over safe shutdown equipment or spent fuel in the spent fuel pool.~~

~~Objective~~

~~To verify that special lifting devices and slings used in conjunction with the auxiliary building crane are operable prior to their use in supporting heavy loads over safe shutdown equipment or spent fuel in the spent fuel pool.~~

~~Specification~~

~~Slings and special lifting devices which will be used in supporting heavy loads from the auxiliary building crane shall be visually inspected and verified OPERABLE within 7 days prior to their use in handling heavy loads over safe shutdown equipment or spent fuel in the spent fuel pool.~~

4.20 Spent Fuel Assembly ~~Pool~~ Storage ~~Configuration~~

~~Applicability~~

~~This surveillance is applicable whenever fuel is stored in the spent fuel pool.~~

~~Objective~~ A3.7-01

~~To verify that fuel assemblies in the spent fuel pool are stored in accordance with the requirements of Specification 3.8.E.1.a.~~

Specification

SR3.7.17.2

A spent fuel pool inventory verification shall be performed within 7 days of the completion of any fuel handling campaign which involves the relocation of fuel assemblies within the spent fuel pool or the addition of fuel assemblies to the spent fuel pool.

SR3.7.17.1 New SR, Verify by administrative means, prior to storing or moving the fuel assembly, the initial enrichment, burnup and decay time of the fuel assembly is in accordance with Figure 3.7.17-1 or Figure 3.7.17-2 as applicable or Specification 4.3.1.1. M3.7-107

PACKAGE 3.7

PLANT SYSTEMS

PART D

DISCUSSION OF CHANGES
(DOC)

to

PRAIRIE ISLAND
CURRENT TECHNICAL SPECIFICATIONS

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
UNITS 1 AND 2

Improved Technical Specifications
Conversion Submittal

PART D

PACKAGE 3.7

PLANT SYSTEMS

DISCUSSION OF CHANGES TO CURRENT TECHNICAL SPECIFICATIONS

The proposed changes to PI Operating License Appendix A, TS are discussed below and the specific wording changes are shown in Parts B, C and E.

For ease of review, all package parts and discussions are organized according to the proposed PI ITS Table of Contents.

NSHD category	Change number 3.7-	Discussion Of Change
A	001	CTS 3.4, 3.13, 4.7, 4.8, 4.14, 4.15 and 4.20. The beginning of each CTS section contains general statements of Applicability and Objectives for that TS section. This Applicability states the systems to which the specifications apply which is a different meaning than the Applicability in NUREG-1431. Since the ITS clearly states within each specification the system to which it applies, administratively these statements have been incorporated. Likewise, the CTS Objectives statement provides an overall purpose for the specifications within the section. These objectives are administratively incorporated in general through the statement of the ITS specification LCO and the supporting Bases. Since these general CTS statements do not establish any regulatory requirements and are incorporated in a broad sense in the ITS, these are considered administrative changes.

NSHD category	Change number 3.7-	Discussion Of Change
A	002	CTS 3.4.A, 3.4.B, 3.4.C, 3.4.D, 3.3.C, 3.3.D, 3.6.E and 3.6.F. The CTS contain prose descriptions of the conditions for which the specification is applicable. This description has been replaced with the equivalent MODES of applicability for the ITS. Since the plant conditions to which this specification apply have not changed, this is an administrative change.
L	003	CTS 3.4.A.2.a. A new Condition and associated Required Action and Completion Time are included to allow some reasonable time to restore an inoperable MSSV to operable status and begin preparations to shut the plant down. PI CTS do not address the condition when a MSSV is inoperable. PI is not proposing to continue plant operation for extended periods at reduced power with less than all ten MSSVs operable; therefore an allowed outage time is required to restore an inoperable valve and make preparations to shut down. The four hour time limit is based on engineering judgement in accordance with WCAP 11618. This change is less restrictive since CTS would require entry into CTS 3.0.C which would allow the plant to continue to operate 1 hour while corrective actions are pursued.

NSHD category	Change number 3.7-	Discussion Of Change
A	004	CTS 3.4.A.2, 3.4.B.2, 3.3.C.1.b, 3.3.D.2 and 3.13.A.2. The CTS contain prose descriptions of the conditions in which the plant must remain when equipment is inoperable. This description has been replaced with the equivalent MODES of applicability for the ITS under current plant practice in conjunction with CTS specification. Since the plant conditions to which this specification apply have not changed, this is an administrative change.
A	005	CTS 3.4.A.2, 3.4.B.2, 3.4.D, 3.3.C.1.b, 3.3.D.2, 3.13.A.2 and 3.6.E.1. The CTS contains prose descriptions of the conditions in which the plant must be placed when plant equipment remains inoperable beyond the Technical Specification allowed outage time. This description has been replaced with the equivalent ITS MODES. Since the plant conditions in which the plant is placed have not changed, this is an administrative change.
A	006	CTS 3.4.a.2, 3.4.B.2, 3.4.D, 3.3.C.1.b, 3.3.D.2, 3.13.A.2 and 3.6.E.1. As a matter of convention, the CTS define times for required actions from the time a new action is initiated. The ITS convention defines all action times from the time the first initiated action occurs. Thus this markup shows the time under the ITS convention which is equivalent to the CTS required action time. Since in actuality the time has not been changed, this is an administrative change.

NSHD category	Change number 3.7-	Discussion Of Change
L	007	CTS 3.4.A.2.a. This change will allow one SG PORV to be inoperable for 7 days and two SG PORVs inoperable for 24 hours. It is acceptable to have one SG PORV inoperable for this length of time because the other SG PORV is still operable and there are other comparable means of heat removal such as the Steam Dump and Main Steam Safety Valves. It is acceptable to have two SG PORVs inoperable for 24 hours because there is a low probability of a SG Tube Rupture coincident with a loss of offsite power. Also there are other means of removing heat such as the Steam Dump and Main Steam Safety Valves. Since these changes extend the time the plant can operate with equipment out of service, these changes are less restrictive.
M	008	CTS 3.4.B.1.a. In conformance with the guidance of NUREG-1431, the more general term "train" is used instead of only requiring AFW pumps to be operable. Since the requirement for a "train" to be operable may require more equipment, this change is more restrictive. Also the specifications have been simplified in that the AFW requirements for a single unit operating are specified. If two units are operating, then the same requirements apply to each unit individually.

NSHD category	Change number 3.7-	Discussion Of Change
A	009	CTS 3.4.B.1.b. The AFW requirements for two units operating have been included in the ITS LCO such that the requirements are the same for each operating unit; thus a separate statement for two unit operation is not required. Since these requirements have been incorporated into the ITS, this is an administrative change.
	010	Not used.
L	011	CTS 3.4.B.1.c. This statement has been replaced with a LCO Note which specifies that AFW is considered operable during alignment and operation for SG level control if capable of being manually realigned to the AFW mode of operation. Since the note is broader in scope than this specification, this change is considered less restrictive. This change incorporates the conditions of NRC letter from Beth Wetzel to Roger Anderson, dated October 17, 1997.
M	012	A new SR, 3.7.5.1, is included which requires that AFW valves that are not locked, sealed or otherwise secured in position, are in the correct position. Since this SR requires additional plant activities, it is more restrictive. This more restrictive change is included to make the PI ITS complete. This change is consistent with the guidance of NUREG-1431.

NSHD category	Change number 3.7-	Discussion Of Change
M	013	A new specification, 3.7.2, is included which requires two MSIVs to be operable. PI CTS require surveillance of the MSIVs but does not include any limiting conditions for operations. Since this new specification places additional restrictions on the plant, this change is more restrictive. This change is included to make the PI ITS consistent with the guidance of NUREG-1431. This change is acceptable because the MSIVs are currently administratively required to be operable by the plant.
M	014	A new specification, 3.7.3, is included which requires two MFRVs and associated bypass valves to be operable. Since this new specification places additional restrictions on the plant, this change is more restrictive. This change is included to make the PI ITS consistent with the guidance of NUREG-1431. This change is acceptable because the MFRVs and associated bypass valves are currently administratively required to be operable by the plant.
M	015	Two new SRs, 3.7.3.1 and 3.7.3.2 are included which require verification of the isolation time for the MFRV and MFRV bypass valves on an actual or simulated signal. Since these new specifications place additional restrictions on the plant, these changes are more restrictive. These changes are included to make the PI ITS consistent with the guidance of NUREG-1431. These changes are acceptable because the MFRVs and MFRV bypass valves are currently administratively required to be operable by the plant.

NSHD category	Change number 3.7-	Discussion Of Change
M	016	CTS 3.4.B.1.d. The CTS requirement for 100,000 gallons of water in the CTSs is clarified to require 100,000 gallons per unit. Since this requires more water than is currently required, this is a more restrictive requirement. This change is acceptable because the plant currently maintain 100,000 gallons per unit in accordance with current plant procedures.
LR	017	CTS 3.4.B.1.d. The details of the OPERABILITY requirements for the condensate storage tank, including backup water supply requirements have been relocated to the Bases. These specification details are unnecessary since the Specification requirement that the CST is OPERABLE envelopes these requirements. This change is consistent with the guidance of NUREG-1431. Since the ITS Bases (under the Bases Control Program in Section 5.5 of the ITS) are licensee controlled, this change is less restrictive.
LR	018	CTS 3.4.B.1.e, f and g. The details of the OPERABILITY requirements for AFW system motor operated and manual valves, and condensate cross connect valve to the AFW system have been relocated to the TRM. These specification details are unnecessary in the TS since the Specification requirement that the AFW system is OPERABLE envelopes these requirements. This change is consistent with the guidance of NUREG-1431. Since the TRM is licensee controlled, this change is less restrictive. This change is acceptable since the TRM is under the regulatory controls of 10 CFR 50.59.

NSHD category	Change number 3.7-	Discussion Of Change
LR	019	CTS 3.4.B.2.a. CTS and ITS allow startup to proceed without demonstration of AFW pump and associated valve operability. CTS details on the conditions of inoperability have been relocated to the Bases. This change is consistent with the guidance of NUREG-1431 as modified by approved travellers. This change is acceptable because the turbine driven AFW pumps will continue to be maintained and tested as they are under the CTS requirements. Since the ITS Bases (under the Bases Control Program in Section 5.5 of the ITS) are licensee controlled, this change is less restrictive.
A	020	CTS 3.4.B.2. CTS states that. "any one of the following conditions of inoperability may exist . . ." This requirement prevents two or more of the listed conditions from existing at the same time. The limitation that only one condition of inoperability may exist is not explicitly stated in ITS. In ITS, these conditions may be in more than one specification. However, in the NUREG-1431 format, the SFDP exists to provide a mechanism to assure that entry into multiple TS Conditions will not result in loss of safety function. Thus the SFDP limits these conditions from simultaneous existence when there is a loss of safety function. The Maintenance Rule will also assure that multiple equipment inoperabilities are evaluated for reduction of plant safety. Since the ITS includes provisions to address this clause, there is no net change in plant safety and this is an administrative change.

NSHD category	Change number 3.7-	Discussion Of Change
A	021	CTS 3.4.B.2.a. The CTS requirements for completion of turbine driven AFW pump testing have been reworded to be consistent with the NUREG-1431 format. Since there are no substantive changes, this is an administrative change.
L	022	CTS 3.4.B.2. A new Condition is included which allows one steam supply to the turbine driven AFW pump to be inoperable for 7 days. This is less restrictive since the CTS allow a TDAFW pump, valve or piping to be inoperable for 72 hours. However, the TDAFW pump is NOT inoperable when one steam supply is inoperable. Seven days is acceptable since there is a redundant steam supply to the pump; there is also a redundant motor driven pump and there is a low probability of an event which requires the inoperable steam supply to the TDAFW pump. This change is consistent with the guidance of NUREG-1431.
M	023	CTS 3.4.B.2.a. The CTS requirement that specifies equipment that may be inoperable is generalized to allow an AFW train to be inoperable. Since more equipment under this specification may make the AFW train inoperable, this change is considered more restrictive. Since a "train" of equipment is more inclusive, this change may enhance plant safety. This change is consistent with the guidance of NUREG-1431.

NSHD category	Change number 3.7-	Discussion Of Change
LR	024	CTS 3.4 B.2.b. Since the ITS specifies that a whole train may be inoperable, the definition of equipment that may be inoperable is unnecessary in the TS and therefore relocated to the Bases. This change is consistent with the guidance of NUREG-1431. Since the ITS Bases (under the Bases Control Program in Section 5.5 of the ITS) are licensee controlled, this change is less restrictive.
L	025	CTS 3.4.B.2.c. This change will allow the CSTs to be inoperable for 7 days. This is acceptable due to the availability of the backup supply of water from the cooling water system and the low probability of an event during this time which will require the CSTs. Also, inoperable CSTs does not necessarily mean total loss of function, such as the circumstances when the CST level is low. This change is consistent with the guidance of NUREG-1431. Since plant equipment may be inoperable for additional time beyond that allowed in the CTS, this change is less restrictive.
M	026	CTS 3.4.B.2.c. The ITS requires verification of cooling water supply availability within four hours and every 12 hours thereafter. This additional verification provides that the plant will be maintained in a safe condition during the extended time the CSTs are allowed to be inoperable. Since a specific time for verification is provided, this is a more restrictive change. Verification within 4 hours and every 12 hours thereafter does not place the plant at risk and may improve plant safety. This change is consistent with the guidance of NUREG-1431.

NSHD category	Change number 3.7-	Discussion Of Change
M	027	A new SR, 3.7.6.1, is included which requires verification of the CST inventory every 12 hours. Currently plant procedures require verification of CST inventory; however, since this SR makes this verification a TS requirement, this change is considered more restrictive. This more restrictive change is included to make the PI ITS complete. This change is consistent with the guidance of NUREG-1431.
LR	028	CTS 3.4.B.2.d. The details of inoperability conditions for the AFW backup supply of water from the cooling water system have been relocated to the Bases for the AFW system. AFW system OPERABILITY will require the availability of the backup water supply. Therefore, these specification details are unnecessary since the Specification requirement for AFW system OPERABILITY and associated ACTIONS envelope these requirements. This change is consistent with the guidance of NUREG-1431. Since the ITS Bases (under the Bases Control Program in Section 5.5 of the ITS) are licensee controlled, this change is less restrictive.
LR	029	CTS 3.4.B.2.e. The details of inoperability conditions for AFW system valves have been relocated to the TRM. These specification details are unnecessary since the Specification requirement for AFW system OPERABILITY and associated ACTIONS envelopes these requirements. This change is consistent with the guidance of NUREG-1431. Since the TRM is licensee controlled, this change is less restrictive. This change is acceptable since the TRM is under the regulatory controls of 10 CFR 50.59.

NSHD category	Change number 3.7-	Discussion Of Change
M	030	CTS 3.4.D. CTS requires the plant to meet secondary coolant radiochemistry requirements while in MODES 1, 2, and 3. When these limits are not met the plant is required to go to MODE 4 within 12 hours. These requirements have been conformed to the more restrictive requirements of NUREG-1431 by applying the radiochemistry limits in MODE 4 and requiring the plant to go to MODE 5 within 36 hours. This change is acceptable since it will not cause any unsafe plant operations and is consistent with current plant operating practices when radiochemistry limits are not met in MODE 4.
A	031	CTS 3.3.C.1.b. CTS states that. "any one of the following conditions of inoperability may exist . . ." This requirement prevents two or more of the listed conditions from existing at the same time to assure that there is no loss of safety function. The limitation that only one condition of inoperability may exist is not explicitly stated in ITS. In ITS, the system is treated as "trains" rather than individual components. The ITS assures there is no loss of safety function by requiring one train to be operable at all times. Multiple components within a train may be inoperable since the whole train is considered inoperable when one component is not operable. Since there is no net change in plant safety, this is an administrative change.

NSHD category	Change number 3.7-	Discussion Of Change
R	032	CTS 3.4 C and 4.8.C. This specification provides requirements for the plant Steam Exclusion System. The Steam Exclusion System LCO and SR requirements have been relocated to the TRM since the system does not meet the criteria of 10 CFR 50.36 for inclusion in the Technical Specifications. This system is an installed system for preventing steam from high energy line breaks from reaching safeguards equipment; thus it does not meet 10 CFR 50.36 (c)(2)(ii) Criterion 1 or 2. The Steam Exclusion System is an installed system. However, it does not mitigate accidents and thus is not a primary success path for mitigating accidents. Therefore, the Steam Exclusion System does not meet 10 CFR 50.36 (c)(2)(ii) Criterion 3. The Steam Exclusion System is not considered in the plant IPE and it is not a system which operating experience or probabilistic risk assessment has shown to be significant to public health and safety. Therefore this system does not meet 10 CFR 50.36 (c)(2)(ii) Criterion 4.
L	033	CTS Table 3.5-2B, Functional Unit 5a and Table 4.1-1B, Functional Unit 5a. CTS requires operability of the main steam line isolation valves manual switches at all times when in MODE 2. In the ITS, MODE 2 applicability is modified by a condition which does not require these switches to be operable when both MSIVs are closed. Since this change limits the applicability for these switches, this is a less restrictive change. This change is acceptable since the steam line isolation function is met passively without these switches operable when both MSIVs are closed. This change conforms to the guidance of NUREG-1431.

NSHD category	Change number 3.7-	Discussion Of Change
A	034	CTS Table 3.5-2B, Note c and Table 4.1-1B, Note 23. The format of this note has been revised to conform to the guidance of NUREG-1431. The note has been restated but has the same meaning; therefore this is an administrative change.
M	035	CTS 3.4.D. For consistency with NUREG-1431, 3.7.18 action statements, the one hour to initiate actions necessary to place the unit in MODE 3 has been deleted. Since this change may require the plant to shutdown sooner, it is a more restrictive change. This change does not cause the plant to be operated in an unsafe manner.
A	036	CTS3.3.C.1. The CTS has separate specifications for single unit or two unit operations. The ITS is written such that the requirements are the same for single or two unit operation. Any differences are addressed in the Bases.
M	037	CTS 3.3.C.1.a.1. For consistency with the format guidance of NUREG-1431, the requirement for two CC pumps to be OPERABLE has been generalized to require two trains of CC to be operable. Since this may require more equipment to be operable, this is a more restrictive requirement. This change is acceptable since the requirement for two trains may increase plant safety.

NSHD category	Change number 3.7-	Discussion Of Change
LR	038	CTS 3.3.C.1.a.2. Since the ITS specifies that a whole train is required to be OPERABLE, the definition of specific components required to be OPERABLE is unnecessary in the TS and therefore relocated to the Bases. This change is consistent with the guidance of NUREG-1431. Since the ITS Bases (under the Bases Control Program in Section 5.5 of the ITS) are licensee controlled, this change is less restrictive.
M	039	A new SR, 3.7.7.1, is included which requires that CC valves in flow paths to safety related equipment that are not locked, sealed, or otherwise secured in position, are in the correct position. Since this SR may require additional plant activities, it is more restrictive. This more restrictive change is included to make the PI ITS complete. This change is consistent with the guidance of NUREG-1431. This change is acceptable since it may increase plant safety.

NSHD category	Change number 3.7-	Discussion Of Change
M	040	CTS Table 3.5-2B, Action 27. The CTS requirements for the main steam line isolation valve (MSIV) manual switches are included in the ITS LCO 3.7.2 requirements because: 1) LCO 3.7.2 is a new specification for PI which should include all applicable design features of the MSIVs; and 2) these switches directly operate the MSIV without any intervening logic circuitry. CTS requires an inoperable MSIV manual switch to be restored to operability within 48 hours. ITS LCO 3.7.2 requires the MSIVs (including switches) to be restored to operability within 8 hours or be in MODE 2 within 14 hours, close the valve within 22 hours and verify the valve to be closed once per 7 days. Since this will require the plant to shut down much sooner, this is a more restrictive change. This change is acceptable since it places the plant in a safer condition sooner and does not introduce any unsafe plant operations or tests.
LR	041	CTS3.3.C.2. The new format of the PI ITS requires that each unit has two trains OPERABLE. The details of equipment required to define two OPERABLE trains is contained in the Bases. Therefore, these details are unnecessary in the TS and are relocated to the Bases. This change is consistent with the guidance of NUREG-1431. Since the ITS Bases (under the Bases Control Program in Section 5.5 of the ITS) are licensee controlled, this change is less restrictive.

NSHD category	Change number 3.7-	Discussion Of Change
M	042	CTS3.3.D.1. For consistency with the format guidance of NUREG-1431, the detailed listing of equipment required to be OPERABLE has been generalized to require two trains of Cooling Water (CL) to be operable. Since this may require more equipment to be operable, this is a more restrictive requirement. This change is acceptable since the requirement for two trains may increase plant safety.
LR	043	CTS 3.3.D.1.a., b., and c. .The new format of the PI ITS requires that each unit has two trains OPERABLE. The details of equipment required to define two OPERABLE trains is contained in the Bases. Therefore, these details are unnecessary in the TS and are relocated to the Bases. This change is consistent with the guidance of NUREG-1431. This change also relocates the CTS requirements for non-safeguards CL pumps to the Bases. The non-safeguards pumps do not detect RCS leakage, they are not an initial condition of a DBA, they are not components that are part of the primary success path for mitigation of a DBA and they are not significant to public health and safety; thus these pumps do not meet the Screening Criteria for inclusion in the ITS. Since the ITS Bases (under the Bases Control Program in Section 5.5 of the ITS) are licensee controlled, this change is less restrictive.

NSHD category	Change number 3.7-	Discussion Of Change
A	044	CTS3.3.D.1.a. For clarity and consistency with the format requirements of NUREG-1431, the CTS requirements for safeguards CL pump inoperability have been restated as "No safeguards pumps OPERABLE for one train . . ." Since this statement is substantively the same as the CTS requirements and does not change any requirements for plant operation, this is an administrative change.
LR	045	CTS 3.3.D.2.a.(1) and (2). CTS provides specific actions to be taken if two CL safeguards pumps are inoperable. Under the guidance and format of NUREG-1431, these specific requirements are relocated to the Safety Function Determination Program (SFDP) as required by LCO 3.0.6 and 5.5.13, Safety Function Determination Program. This change is acceptable since the actions required to assure the plant is operated safely without loss of safety function is provided by the required Safety Function Determination Program. Since the SFDP is under licensee control, this change is less restrictive. This change is consistent with the guidance of NUREG-1431.

NSHD category	Change number 3.7-	Discussion Of Change
M	046	CTS3.3.D.2.b.(1) and (2). CTS allow one CL header to be inoperable provided the vertical motor-driven CL is operable, but no time frame is defined within which this action is required to be completed. In the format of the ITS, some COMPLETION TIME is required to be defined for REQUIRED ACTIONS. Under the requirements of ITS LCO 3.0.6, the other train will be verified to be operable, including the OPERABILITY of the diesel driven cooling water pump on the operable header. The vertical motor driven CL pump provides added assurance that there is a safeguards pump to supply the operable header. Thus 4 hours is provided as the required time-frame in which the vertical motor driven CL pump must be verified to be operable. Since a specific time is specified, this change is more restrictive.
LR	047	CTS 3.3.D.2.b.(1) and (2). CTS allow one CL header to be inoperable provided the horizontal CL pump is verified to be operable. Under the format and guidance of NUREG-1431, the other header including the horizontal pump will be verified to be OPERABLE in accordance with the Safety Function Determination Program (SFDP) per ITS LCO 3.0.6 and ITS 5.5.13, Safety Function Determination Program. Since this verification is required by the SFDP, it is not included in the ITS and is considered relocated to the SFDP. Since the SFDP is under licensee control, this change is less restrictive. This change is acceptable since the CTS required actions will continue to be performed.

NSHD category	Change number 3.7-	Discussion Of Change
M	048	A new SR, 3.7.8.1, is included which requires that CL valves in flow paths to safety related equipment that are not locked, sealed, or otherwise secured in position, are in the correct position. This SR is modified by a Note that clarifies that the CL system is not inoperable if the flow path to an individual component is isolated. The operability of each TS system affected by an isolated component would have to be evaluated under the TS definition of OPERABILITY. Since this SR may require additional plant activities, it is more restrictive. This more restrictive change is included to make the PI ITS complete. This change is consistent with the guidance of NUREG-1431. This change is acceptable since it may increase plant safety.
M	049	CTS3.3.D.2.c. CTS allow one Safeguards Traveling Screen to be inoperable provided a sluice gate is open but no time frame is defined within which this action is required to be completed. In the format of the ITS, some COMPLETION TIME is required to be defined for REQUIRED ACTIONS. Since there is a redundant Safeguards Traveling Screen and an inoperable Safeguards Traveling Screen may not have an immediate loss of function, four hours was selected as a reasonable time to complete this action. Since a specific time is specified, this change is more restrictive. This change is included to make the ITS complete and will maintain the plant in a safe condition.

NSHD category	Change number 3.7-	Discussion Of Change
L	050	CTS3.3.D.1.d. CTS requires a fuel oil supply of 19,000 gallons for the diesel driven CL pumps to be operable. Recent calculations have determined that 19,500 gallons are required to meet the design basis for the diesel driven CL pumps. This is a more restrictive change. The CTS requirement for 70,000 gallons is not included since ITS has a specification for the CL diesel fuel oil supply (3.7.8) and the diesel generator fuel oil supply (3.8.3). The CTS requirements are confusing and have been clarified with these two separate specifications. This is an administrative change. NUREG-1431 allows the safeguards diesel generators to have their fuel oil supply below the required limits for 48 hours with an appropriate track for declaring them inoperable. Since NUREG-1431 assumes that all CL pumps are motor driven, similar provision is not given for the CL pumps. Consistent with the intent of NUREG-1431 for the diesel generators, the ITS allows the diesel CL pump fuel oil supply to be below limits for 48 hours with an appropriate track for declaring them inoperable. This is operational flexibility which is not provided by the CTS; thus this is a less restrictive change. Overall, these changes are considered a less restrictive change. These changes are consistent with the intent of NUREG-1431.

NSHD category	Change number 3.7-	Discussion Of Change
M	051	CTS3.3.D.2.d. CTS allow both Safeguards Traveling Screens to be inoperable provided a sluice gate is open but no time frame is defined within which this action is required to be completed. In the format of the ITS, some COMPLETION TIME is required to be defined for REQUIRED ACTIONS. It is unlikely that both Safeguards Traveling Screens would become inoperable simultaneously; therefore when the first Safeguards Traveling Screen became inoperable the action to open the sluice gate would already have been taken and this CONDITION would likely only require administrative verification that a sluice gate had previously been opened. If both Safeguards Traveling Screens are inoperable, expeditious action is required to remedy the situation; thus one hour was selected as a reasonable time to complete this action. One hour is consistent with the time allowed in CTS 3.0.C to take action prior to shutdown when the plant is in conditions not addressed by TS. Since a specific time is specified, this change is more restrictive. This change is included to make the ITS complete and will maintain the plant in a safe condition.

NSHD category	Change number 3.7-	Discussion Of Change
M	052	CTS3.3.D.2.3. CTS allow the Emergency CL line to be inoperable provided a sluice gate connecting the emergency bay and the circulating water bay is open, but no time frame is defined within which this action is required to be completed. In the format of the ITS, some COMPLETION TIME is required to be defined for REQUIRED ACTIONS. Under the provisions of CTS 3.0.C, if this action was not completed, the plant would have 1 hour to initiate actions to shut the plant down. Therefore, 1 hour has been allowed to perform these verifications and take actions to assure these required pumps are operable. Since a specific time is specified, this change is more restrictive. This change is included to make the ITS complete and will maintain the plant in a safe condition.
M	053	A new SR, 3.7.9.1, is included which requires verification that the safeguards travelling screens are operable. This verifications is currently performed under plant procedures. For completeness and consistency with the guidance of NUREG-1431, this verification is included as a formal SR. This SR will assure the plant is maintained in a safe condition.

NSHD category	Change number 3.7-	Discussion Of Change
L	054	CTS 3.13.A.1. The requirement for CRSVS operability has been revised to include MODES 1, 2, 3 and 4 and during movement of irradiated fuel. When neither unit is in one of these modes or conditions, the CRSVS is not required to perform a safety function. Design basis accidents with radiological releases are not analyzed for MODES 5 and 6. CRSVS operability during CORE ALTERATIONS is not required because:1) borated water prevents a problem with inadvertent rod withdrawal; 2) operators have sufficient time to identify and terminate a dilution accident; and 3) while shutdown, the borated water will maintain any misloaded assembly in a safe condition. The applicability would not require the CRSVS to be operable during handling of new fuel. This is acceptable since new fuel does not contain any fission gas inventory. This change is consistent with TSTF-51. Since this change allows CRSVS inoperability during some modes, this change is less restrictive.
M	055	CTS 3.13.A.1. For consistency with NUREG-1431, the one hour to initiate actions to shut down has been deleted. This is also consistent with proposed ITS LCO 3.0.3 which does not allow an additional hour to initiate shutdown. This is acceptable since the Required Actions already allow time to take actions and prepare for shutdown if required.

NSHD category	Change number 3.7-	Discussion Of Change
L	056	CTS 3.13.A.1 and 2. CRSVS operability during CORE ALTERATIONS is not required because:1) borated water prevents a problem with inadvertent rod withdrawal; 2) operators have sufficient time to identify and terminate a dilution accident; and 3) while shutdown, the borated water will maintain any misloaded assembly in a safe condition. This change is consistent with TSTF-51. Since this change allows CRSVS inoperability during CORE ALTERATIONS, this change is less restrictive.
A	057	CTS 3.13.A.1 and 2. NUREG-1431 provides separate action statements for CRSVS during plant operation (MODES 1, 2, 3, and 4) and irradiated fuel handling operations. For clarity a new statement is included to show the changes in the CTS markup. Since this statement by itself does not change any CTS requirements, it is an administrative change.
M	058	CTS 3.13.A.1. CTS provisions which allow two hours to take actions with respect to fuel handling have been deleted since NUREG-1431 requires immediate termination of irradiated fuel handling activities. If only one train of CRSVS is inoperable, the option of placing the operable CRSVS train in service is included. Immediate termination of irradiated fuel handling and placement of the operable CRSVS train in service are acceptable since they maintain the plant in a safe condition. These changes are more restrictive since required actions are required to occur sooner.

NSHD category	Change number 3.7-	Discussion Of Change
M	059	A new specification, 3.7.11, is included which requires two safeguards chilled water trains to be operable. Since this new specification places additional TS requirements on the plant, this change is more restrictive. This change is acceptable because the plant currently operates this system as a support system to the CRSVS.
M	060	New SR 3.7.8.3 requires monthly verification that the CL diesel fuel oil supply meets the required limits. CTS does not explicitly require verification of the diesel CL pump fuel oil supply; therefore, this is a more restrictive change. This change is acceptable since the plant currently checks the fuel oil supply and this will not introduce any unsafe plant operations or tests. This change is consistent with the intent of NUREG-1431 as applied to diesel generators.
M	061	Two new SRs, 3.7.11.1 and 3.7.11.2, are included which requires verification each SCWS train actuates on an actual or simulated actuation signal and OPERABILITY of SCWS components in accordance with the ITS program. Currently the plant performs these tests. However, these SRs will make these verifications TS requirements; thus, these changes are considered more restrictive. These more restrictive changes are included to make the PI ITS complete.

NSHD category	Change number 3.7-	Discussion Of Change
A	062	CTS 3.6.E. The CTS requirements for Auxiliary Building Special Ventilation Zone Integrity have been included in the ITS 3.7.12 requirements for the ABSVS; thus the title of this section is revised. Since all of the specification requirements are retained in the ITS, this is an administrative change.
LR	063	CTS 3.6.E.2 and 3. The details of inoperability conditions and controls for the ABSVS have been relocated to the TRM and Bases. These specification details are unnecessary since the Specification requirement for ABSVS OPERABILITY in PI ITS 3.7.12 and associated ACTIONS envelopes these requirements. A general discussion of these requirements are included in the Bases for completeness. The specific requirements are included in the TRM to assure that they are readily accessible to the operators. This change is consistent with the format and philosophy of NUREG-1431. Since the ITS Bases (under the Bases Control Program in Section 5.5 of the ITS) and the TRM are licensee controlled, this change is less restrictive. This change is acceptable since both of these documents are under the regulatory controls of 10 CFR 50.59.

NSHD category	Change number 3.7-	Discussion Of Change
LR	064	CTS 3.6.F.1. The details of supporting equipment for operability of ABSVS have been relocated to the TRM and Bases. These specification details are unnecessary since the Specification requirement for ABSVS OPERABILITY in PI ITS 3.7.12 and associated ACTIONS envelopes these requirements. A general discussion of these requirements is included in the Bases for completeness. The specific requirements are included in the TRM to assure that they are readily accessible to the operators. This change is consistent with the format and philosophy of NUREG-1431. Since the ITS Bases (under the Bases Control Program in Section 5.5 of the ITS) and the TRM are licensee controlled, this change is less restrictive. This change is acceptable since both of these documents are under the regulatory controls of 10 CFR 50.59.
M	065	CTS 3.6.F.2. A new action statement, consistent with the guidance of NUREG-1431, is included which addresses the situation when the allowed outage time is not met. Since the CTS does not specify an action, CTS LCO 3.0.C is applicable. This change is more restrictive since the proposed ITS action statement requires shutdown sooner than CTS LCO 3.0.C. This change does not cause the plant to be operated in an unsafe manner.

NSHD category	Change number 3.7-	Discussion Of Change
A	066	CTS 3.8.B.1.c The ITS, consistent with CTS 3.8.E.2.a, requires the boron concentration to be maintained at 1800 ppm at all times when spent fuel is stored in the spent fuel pool. Therefore the applicability is expanded beyond involving a spent fuel cask containing fuel. Since the applicability for this requirement is consistent with CTS 3.8.E.2.a, this is an administrative change. This change is consistent with other CTS requirements and does not cause the plant to operate in an unsafe manner.
LR	067	CTS 3.8.B.1.a. The CTS requirement to continuously monitor radiation levels in the SFP area during fuel handling was not included in the PI ITS. No screening criteria apply for this requirement because the process variable of the LCO is not an initial condition of a DBA or transient analysis. The SFP radiation levels only provide a secondary indication of a SFP area problem. Other ITS LCOs, such as SFP level and boron concentration, provide adequate assurance that all accident analysis assumptions are met. Since this Specification only applies during fuel handling, if an accident were to occur, the personnel stationed in the SFP area would be immediately aware of the problem. Therefore, this specification does not satisfy any of the NRC Final Policy Statement TS screening criteria and is relocated to the TRM. This change is consistent with the guidance of NUREG-1431.

NSHD category	Change number 3.7-	Discussion Of Change
LR	068	CTS 3.8.B.1.b. The requirement to test fuel handling cranes prior to fuel handling is not included in the PI ITS. No screening criteria apply for this requirement because the fuel handling crane limit switches, interlocks and alarms are not installed instrumentation that is used to detect and indicate in the control room, a significant abnormal degradation of the RCS. The crane testing requirements are not related to an initial condition of a Design Basis Accident or Transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. The equipment which is the subject of this specification requirement is not a part of the primary success path for mitigation of a DBA or Transient. If a fuel handling accident occurs, other plant features such as the SFP water and SFPSVS are the primary success paths. Therefore, this specification does not satisfy any of the NRC TS screening criteria and is relocated to the TRM. This change is consistent with WCAP-11618 and the guidance of NUREG-1431.
R	069	CTS 3.8.C. The CTS requirement to limit the number of recently discharged fuel assemblies stored in the small pool (Pool 1) is not included in the PI ITS. This specification does not contain requirements for installed instrumentation. This specification does not address an operating restriction that is an initial condition of a DBA or Transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. This operating restriction on fuel storage is not a structure, system or component. Therefore, this specification does not satisfy any of the NRC Final Policy Statement TS screening criteria and is relocated to the TRM.

NSHD category	Change number 3.7-	Discussion Of Change
	070	Not used.
	071	Not used.
L	072	CTS 3.8.D.2. This proposed change will delete the requirement to demonstrate operability of the redundant SFPSVS train when one train is inoperable. This change is acceptable because there is a low probability of a fuel handling accident in the 7 days that fuel movements are allowed to continue and the redundant train is required by ITS to be tested on a 31 day schedule. Further testing when one train fails is not necessary. This change is consistent with the guidance of NUREG-1431. Since this change may require less testing, it is a less restrictive change.
M	073	CTS 3.8.D.3. The CTS requirement to suspend movement of irradiated fuel is modified to require suspension "immediately". No time frame is specified in the CTS. Since a time frame is specified in the ITS, this change is more restrictive. This change is acceptable since under the CTS requirements, fuel movement would be stopped as soon as practical, which is equivalent to this new required time frame. This change is consistent with the guidance of NUREG-1431.

NSHD category	Change number 3.7-	Discussion Of Change
A	074	CTS 3.8.D.4. and 3.8.E.1.c. CTS LCO 3.0.C is equivalent to ITS LCO 3.0.3 which is referenced for clarity. Since no substantive changes are involved, this is an administrative change.
M	075	A new specification, 3.7.15, is included which requires the fuel storage pool water level to exceed 23 feet over the top of irradiated fuel seated in the storage racks during irradiated fuel movement. This change is consistent with the guidance of NUREG-1431. This new specification is acceptable since the pool level is normally kept at or above this required level during fuel movement. Since this is a formal TS requirement this change is considered more restrictive.
M	076	A new SR, 3.7.15.1, is included which requires verification of the fuel pool level during movement of irradiated fuel. Since this is a new formal TS requirement, this change is considered more restrictive. This more restrictive change is included to make the PI ITS complete. This change is consistent with the guidance of NUREG-1431. This change is acceptable since more frequent verification of the specified level as a formal requirement may increase plant safety.
A	077	CTS 3.8.E.1. The title of this specification has been changed to be consistent with the title of ITS 3.7.17. Since no substantive changes are involved, this is an administrative change.

NSHD category	Change number 3.7-	Discussion Of Change
A	078	CTS 3.8.E.2. The title and terminology within this specification are revised to be consistent with the title and terminology in ITS 3.7.16. Since no substantive changes are involved, this is an administrative change.
R	079	CTS 3.12, 4.13 and Table 4.13-1. The snubber requirements in CTS 3.12 and 4.13 are relocated to the TRM. The CTS inspection and testing requirements do demonstrate the snubbers are OPERABLE. However, the ISI program, required by 10CFR50.55a, provides requirements for testing of snubbers. Prairie Island is required to comply with the provisions of 10CFR50.55a and therefore has an ISI program. This ISI program is reviewed, approved and inspected by the NRC. These controls are adequate to the required inspection and testing to demonstrate snubber operability. Therefore, PI programs and NRC regulations contain adequate requirements for snubbers without repeating them in the TS. Since the snubber requirements will be relocated to the TRM, changes will be under the controls of 10CFR50.59. This change is consistent with the guidance of NUREG-1431.
	080	Not used.

NSHD category	Change number 3.7-	Discussion Of Change
LR	081	CTS Table 4.1-2A, Function 11. CTS requires periodic testing of the turbine stop valves, governor valves and intercept valves. These valve testing requirements have been relocated to the TRM. These valves are not leak detection equipment, they are not process variables, they are not a part of the primary success path for mitigation of an accident and these valves have not been found to be significant to the public health and safety. Therefore these valves do not meet the criteria of 10 CFR 50.36 for inclusion in the TS. Thus the SR for testing these valves has been relocated to the TRM. This change is consistent with the guidance of NUREG-1431. Since the SR for these valves is not in TS, this is a less restrictive change. However, this change is acceptable since the TRM is under the regulatory controls of 10 CFR 50.59.
LR	082	CTS Table 4.1-1B, Functional Unit 5a and 4.7. Specific requirements for the surveillance interval for this test have been relocated to the Inservice Testing Program in accordance with the requirements of ITS Section 5.5, Inservice Testing Program. Since this test program is required by the TS, these requirements remain under regulatory controls. This change is consistent with the options given in NUREG-1431. Since this change removes specific requirements from the TS, it is a less restrictive change.

NSHD category	Change number 3.7-	Discussion Of Change
A	083	CTS 4.7. CTS requirements for testing MSIV closure time upon receipt of an actuation signal is divided into two ITS SRs as discussed in the Justification for Differences for ITS 3.7.2. Therefore another statement for this SR is included here. Since the same test is still performed that is currently required, this is an administrative change.
LR	084	CTS 4.8.A.1. In accordance with approved TSTF-101, the schedule for performing the AFW pump test is relocated to the IST program. Since the schedule is not in the TS, this is change is less restrictive. This change is acceptable since the IST program is reviewed and approved by the NRC and a test schedule which assures the operability of the AFW pumps will be specified.

NSHD category	Change number 3.7-	Discussion Of Change
L	085	CTS 4.8.A.1. The CTS requirement to demonstrate full flow to the SG each refueling shutdown is not included in the ITS. This change is acceptable because the other AFW system SRs assure that full flow will reach the SGs. ITS SRs which implement CTS requirements include verification that each AFW pump develops the required head at the test flow point, verification that automatic valves actuate to the correct position on an actual or simulated signal, and verification of the flow path from the CSTs to each SG after each shutdown extending beyond 30 days. Also a new SR is included, SR 3.7.5.1, which requires verification that each valve in the AFW flow path that is not locked, sealed, or otherwise secured in position, is in the correct position. The combination of these SRs provide the necessary assurances that full AFW flow will reach the SGs. Furthermore this system is used as an operational system to feed the SGs during plant startup until the main feedwater pumps can be started (approximately 2% power); thus if AFW flow was not provided to the SGs, plant startup would not be able to proceed. Therefore this requirement is not included in the ITS. This change is consistent with the guidance of NUREG-1431.

NSHD category	Change number 3.7-	Discussion Of Change
LR	086	CTS 4.8.A.3 and 4. The detailed Specification that the AFW system valves will be tested in accordance with CTS 4.2 (IST program) has not been included. ITS Section 5.5, Programs and Manuals, requires that plant components be tested in accordance with an IST program. Thus these requirements have been relocated to the IST program. This change is acceptable since the IST program is reviewed and approved by the NRC. Since these CTS requirements are not explicitly stated in the ITS, this change is less restrictive. This change is consistent with the guidance of NUREG-1431.
LR	087	CTS 4.8.A.5. The details of SR performance have been relocated to the Bases. Since the ITS requires system operability and performance of tests to demonstrate operability, the details of how the test is performed are unnecessary in the TS. This change is consistent with the format and philosophy of NUREG-1431. Since the ITS Bases (under the Bases Control Program in Section 5.5 of the ITS) are licensee controlled, this change is less restrictive.

NSHD category	Change number 3.7-	Discussion Of Change
L	088	CTS 4.8.A.6. The CTS requirement to verify the position of valves which are locked in position is not included. Some valves in the AFW system are locked, sealed, or otherwise secured in position under administrative controls to assure that AFW flow will not be obstructed or altogether stopped. Since these locks, seals or other secure means are under administrative control, it is unnecessary to verify these valves are secured in the proper position on a regular monthly schedule. Therefore this requirement is not included. Since this change places less requirements on plant operations, it is a less restrictive change. This change is consistent with the guidance of NUREG-1431.
L	089	CTS 4.8.A.7. The CTS requirement to verify the normal AFW flow path to the SGs after each cold shutdown is not included in the PI ITS. At PI the AFW system is used for each normal unit startup and shutdown. Therefore, further documented verification is not necessary. This change is consistent with the guidance of NUREG-1431 which states, "This SR is not required by those units that use AFW for normal startup and shutdown." Since this change requires less plant testing, it is a less restrictive change.
	090	Not used.

NSHD category	Change number 3.7-	Discussion Of Change
L	091	CTS 4.8.A.8. The surveillance interval for verification of AFW system automatic actuation is increased from 18 months to 24 months to accommodate extended refueling cycles. In accordance with SR 3.0.2 this surveillance interval is fixed at this maximum and is not allowed to be extended beyond 24 months. A review of the six year period from January 1990 to the end of 1995 showed that no problems were encountered during the performance of these tests. Therefore extension of this interval up to 24 months is acceptable. This change is consistent with the guidance of GL-91-04. Since this change will allow less frequent performance of this test, this change is less restrictive. For the turbine driven pump, this SR is also allowed to be performed within 24 hours of entering MODE 1 in accordance with the CTS note. This change is consistent with the guidance of NUREG-1431.
L	092	CTS 4.8.A.8, 4.5.A.4 and 4.5.A.5. The phrase "that is not locked, sealed, or otherwise secured in position" is included to make this SR consistent with the guidance of NUREG-1431. This is acceptable, since valves that are physically and administratively secured in position will very likely be in the correct position when system performance is required. Since this may require less verification of plant equipment, this change is less restrictive.

NSHD category	Change number 3.7-	Discussion Of Change
L	093	CTS 4.7, 4.8.A.8, 4.5.A.4, 4.5.A.5, 4.14.A.2, 4.4.B.3.c, 4.4.E and 4.15.A.2. The CTS requirement to perform this SR using a test signal has been broadened to include use of an actual signal. If the system starts due to receipt of an actual signal, this is adequate verification of system operability. Further testing within that test interval should not be required using a test signal. Therefore this change is acceptable. This change is consistent with the guidance of NUREG-1431. Since this change may require less testing, it is a less restrictive change. The CTS requirements have also been split into two SRs for clarity. Currently, the check damper operability is verified monthly under the provisions of the CTS. Since this verification does not involve an actuation signal, this test is specified as a separate SR.
A	094	CTS 4.8.A.1, Footnote. CTS states that test shall be performed within 24 hours of entering power operation. POWER OPERATION in this context has been defined as MODE 1 in accordance with the CTS and ITS definitions. Since no substantive changes are involved, this is an administrative change.

NSHD category	Change number 3.7-	Discussion Of Change
L	095	CTS 4.8.B. The CTS requirement for testing of these valves is relocated to the IST program. The IST program requires testing these valves quarterly in accordance with ASME Section XI requirements. This is acceptable since plant experience has shown that these valves usually pass their surveillance when performed in accordance with the CTS. Thus extension of the test interval to IST requirements is justified. The testing interval for these valves remains under NRC control through NRC review and approval of the IST program. Since this change will require less testing, it is a less restrictive change.
	096	Not used.
A	097	CTS 4.5.A.4. This change includes an explicit requirement to verify that each pump starts. While this can be inferred from the CTS requirements, it is included for clarity. Since no substantive changes are involved, this is an administrative change.

NSHD category	Change number 3.7-	Discussion Of Change
LR	098	CTS 4.5.A.4.b, 4.5.A.5.a, 4.5.B.1.b, 4.5.B.1.c, 4.5.B.3.e, 4.4.B.2 and 4.4.B.3.c. The details of SR performance have been relocated to the Bases. Since the ITS requires system operability and performance of tests to demonstrate operability, the details of how the test is performed are unnecessary in the TS. This change is consistent with the format and philosophy of NUREG-1431. Since the ITS Bases (under the Bases Control Program in Section 5.5 of the ITS) are licensee controlled, this change is less restrictive.
LR	099	CTS 4.5.A.5.b. The requirements for diesel engine inspections will be relocated to the TRM and have not been included in the PI ITS. ITS 3.7.8 requires the necessary CL trains, which includes applicable pumps, to be OPERABLE. The ITS definition of OPERABILITY states, "A system, subsystem, train, component, or device shall be OPERABLE . . . when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system . . . to perform its specified safety function(s) are also capable of performing their related support functions(s)." The definition of OPERABILITY and the requirements of ITS LCO 3.7.8 are adequate for ensuring the diesel driven CL (DDCL) pump is OPERABLE. Therefore the LCO requirement for the DDCL pump to be OPERABLE mandates performance of inspections to the extent that they are required to assure operability of the pump. Thus, these requirements are relocated to the TRM. Relocating these requirements to the TRM maintains consistency with NUREG-1431.

NSHD category	Change number 3.7-	Discussion Of Change
LR	100	CTS 4.4.B.3.c. CTS requires verification that the ABSVS actuates on a high radiation signal in addition to an SI signal. Following an accident, the ABSV system will be actuated by an SI signal, and therefore, actuation by the high radiation signal is not required for accident mitigation. The high radiation signal is not part of RCS leakage detection instrumentation; it is not a variable, design feature or operating restriction that is an initial condition of an accident; it is not a system, structure or component that is part of the primary success path for mitigating an accident; and it is not a structure, system or component which has been shown to be significant to the public health and safety. Thus this signal does not meet the TS Selection Criteria of 10CFR50.36 and is not included in the ITS. This requirement is relocated to the Offsite Dose Calculation Manual (ODCM). Since the ODCM is under licensee control this is a less restrictive requirement. However, this change is acceptable because the ODCM is a program required by ITS Section 5.5 and is under the regulatory controls of 10CFR50.59.
L	101	CTS 4.14.A and 4.15.A. The CTS requirement to test automatic initiation of this system at least every 18 months is not included. The ITS will require this system test every 24 months which will allow extension of the PI refueling outage cycle. A review of past test results for this system test showed that no problems were encountered during the performance of the test. Therefore, extension of the test to the refueling shutdown interval (up to 24 months) is acceptable.

NSHD category	Change number 3.7-	Discussion Of Change
LR	102	CTS 4.14.A.1, 4.14.B, 4.4.B.3, 4.4.B.4, 4.4.B.5, 4.15.A.1, 4.15.B.1, 4.15.B.2 and 4.15.B.3. Specific details for conduct of ventilation filter tests have been relocated to the Ventilation Filter Test Program in accordance with the requirements of PI ITS Section 5.5, Ventilation Filter Test Program. Since this test program is required by the TS, these requirements remain under regulatory controls. This change is consistent with the guidance of NUREG-1431. Since this change removes specific requirements from the TS, it is a less restrictive change.
L	103	CTS 4.14.B.1.c and 4.15.B.1.c. The test interval for verification of fan performance has been extended to once per operating cycle on a STAGGERED TEST BASIS (STB). Past experience has shown that this system usually passes the fan flow test. Fan performance usually changes slowly over long periods of time which would allow prediction of unacceptable performance before a test is actually failed. Other system tests verify that the fans move air. This test verifies that the air movement is within the specified limits. If the fan fails the test, it may still move air and continue to perform most of its safety function. Therefore, extension of the interval to 24 months on an STB is acceptable. The change to 24 months is consistent with the guidance of Generic Letter 91-04. The change to an STB is consistent with the guidance of NUREG-1431. Since this change will require less testing, it is less restrictive.

NSHD category	Change number 3.7-	Discussion Of Change
M	104	CTS 4.14.B.4, 4.4.B.4.d and 4.15.B.4. "Circuit" has been replaced with "train" to be consistent with the terminology used in the ISTS. Since a train may include more equipment than a circuit, this is considered a more restrictive requirement. This change is consistent with the guidance of NUREG-1431. This change is incorporated to conform the PI ITS to the philosophy of the ISTS and make it complete.
A	105	CTS 4.4.E. The CTS requirement to test the auxiliary building normal ventilation system isolation valves is included in the requirements of SR 3.7.12.4. Since no substantive changes have been made in this clarification, this is an administrative change.

NSHD category	Change number 3.7-	Discussion Of Change
R	106	CTS 4.19. The requirements to inspect AB crane lifting devices prior to handling heavy loads is not included in the PI ITS. No screening criteria apply for this requirement because the AB crane lifting devices are not installed instrumentation that is used to detect and indicate in the control room a significant abnormal degradation of the RCS. The AB crane lifting device inspection requirements are not related to an initial condition of a Design Basis Accident or Transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. The equipment which is the subject of this specification requirement does not in any way mitigate the consequences of an accident and therefore is not a part of the primary success path for mitigation of a DBA or Transient. Therefore, this specification does not satisfy any of the NRC Final Policy Statement TS screening criteria and is relocated to the USAR (TRM). This change is consistent with WCAP-11618 and the guidance of NUREG-1431.
M	107	CTS 4.20. A new SR, 3.7.17.1 is included to require verification of each assembly prior to moving the assembly. This change is acceptable because this verification is currently performed in accordance with plant procedures. Since this is a new TS requirement, it is a more restrictive change. This change is consistent with the guidance of NUREG-1431.

NSHD category	Change number 3.7-	Discussion Of Change
M	108	CTS Table 4.1-2B, Item 15 and Note 5. CTS allows this surveillance to be performed every six months when the activity level is less than 10% of the limit. This change will conform this SR to NUREG-1431 SR 3.7.18.1 requirements which require the surveillance to be performed every 31 days regardless of activity level. This change is acceptable since it will not cause any unsafe plant operations or tests and the plant currently performs this testing within a 31 day frequency.
	109	Not used.
	110	Not used.
	111	Not used.

NSHD category	Change number 3.7-	Discussion Of Change
LR	112	CTS Table 4.1-2B, Items 14, 16 and Note 6. CTS requirements to sample the Secondary coolant gross Beta-Gamma activity (Item 14) and Secondary coolant chemistry (Item 16) have been relocated to the TRM. These sampling tests are not leak detection equipment, they are not process variables, they are not a part of the primary success path for mitigation of an accident and these tests have not been found to be significant to the public health and safety. Therefore these sampling tests do not meet the criteria of 10 CFR 50.36 for inclusion in the TS. Item 14 is not the subject of a TS in NUREG-1431, and since it does not meet the criteria of 10 CFR 50.36 (c)(2)(ii) it is not included in the ITS. Item 16 is related to the Secondary Water Chemistry Program in NUREG-1431 Section 5.5 and thus is not the subject of a TS in NUREG-1431. In accordance with the PI LAR dated December 14, 1995 (LA 141/132), PI does not propose to include a Secondary Water Chemistry Program in the ITS. Thus, Item 16 has been relocated to the TRM. Since the SR for these tests are not in ITS, this is a less restrictive change. However, this change is acceptable since the TRM is under the regulatory controls of 10 CFR 50.59.

PACKAGE 3.7

PLANT SYSTEMS

PART E

MARKUP OF NUREG-1431
IMPROVED STANDARD TECHNICAL SPECIFICATIONS AND BASES

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PRAIRIE ISLAND NUCLEAR GENERATING PLANT
UNITS 1 AND 2

Improved Technical Specifications
Conversion Submittal

3.7 PLANT SYSTEMS

3.7.1 Main Steam Safety Valves (MSSVs)

LCO 3.7.1 Five~~The~~ MSSVs per steam generator shall be OPERABLE~~ as specified in Table 3.7.1-1 and Table 3.7.1-2~~. CL3.7-111

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

~~NOTE~~
~~Separate Condition entry is allowed for each MSSV.~~ CL3.7-112

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ~~or more required~~ MSSV~~s~~ inoperable.	A.1 Restore inoperable MSSV to OPERABLE status~~Reduce power to less than or equal to the applicable % RTP listed in Table 3.7.1-1~~.	4 hours CL3.7-111
B. Required Action and associated Completion Time not met. ~~OR~~ ~~One or more steam generators with less than [two] MSSVs OPERABLE.~~	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours CL3.7-111

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.1.1 ----------NOTE---------- Only required to be performed in MODES 1 and 2. ---------- Verify each ~~required~~ MSSV lift setpoint per Table 3.7.1-1~~2~~ in accordance with the Inservice Testing Program. Following testing, lift setting shall be within ± 1%.	In accordance with the Inservice Testing Program CL3.7-111

~~Table 3.7.1-1 (page 1 of 1)~~
~~OPERABLE Main Steam Safety Valves versus~~
~~Applicable Power in Percent of RATED THERMAL POWER~~

~~MINIMUM NUMBER OF MSSVs PER STEAM GENERATOR REQUIRED OPERABLE~~	~~APPLICABLE POWER (% RTP)~~ CL3.7-111
~~5~~	~~# 100~~
~~4~~	~~# 80~~
~~3~~	~~# 60~~
~~2~~	~~# 40~~

Table 3.7.1-~~1~~2 (page 1 of 1)
Main Steam Safety Valve Lift Settings

VALVE NUMBER	LIFT SETTING (psig ± ~~[~~3~~]~~%)
~~STEAM GENERATOR~~	
Unit 1 Unit 2	
Steam Generator #1~~1~~ #~~1~~2 ~~[~~#2~~1~~3~~]~~ — ~~[~~#2~~2~~4~~]~~	
RS-21-1 RS-21-6 RS-21-11 RS-21-16	1077
RS-21-2 RS-21-7 RS-21-12 RS-21-17	1093
RS-21-3 RS-21-8 RS-21-13 RS-21-18	1110
RS-21-4 RS-21-9 RS-21-14 RS-21-19	1120
RS-21-5 RS-21-10 RS-21-15 RS-21-20	1131

3.7 PLANT SYSTEMS

3.7.2 Main Steam Isolation Valves (MSIVs)

LCO 3.7.2 [Two~~[Four]~~ MSIVs shall be OPERABLE. PA3.7-114

APPLICABILITY: MODE 1,
MODES 2 and 3 except when both~~all~~ MSIVs are closed~~and [de-activated]~~. PA3.7-114 CL3.7-115

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One MSIV inoperable in MODE 1.	A.1 Restore MSIV to OPERABLE status.	~~[8]~~ hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 2.	6 hours
C. ~~NOTE Separate Condition entry is allowed for each MSIV.~~ --- One ~~or more~~ MSIV~~s~~ inoperable in MODE 2 or 3.	C.1 Close MSIV. AND C.2 Verify MSIV is closed.	~~[8]~~ hours Once per 7 days PA3.7-114

D. Required Action and associated Completion Time of Condition C not met.	D.1	Be in MODE 3.	6 hours
	AND		
	D.2	Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	----------NOTE---------- Only required to be performed in MODES 1 and 2. ---------- Verify the isolation ~~closure~~ time of each MSIV is ≤ 5.0~~[4.6]~~ seconds ~~on an actual or simulated actuation signal~~.	In accordance with the ~~[~~Inservice Testing Program ~~or [18] months]~~ TA3.7-117
SR 3.7.2.2	----------NOTE---------- Only required to be performed in MODES 1 and 2. ---------- Verify each MSIV actuates to the isolation position on an actual or simulated actuation signal.	24 months TA3.7-117 X3.7-137

3.7 PLANT SYSTEMS

3.7.3 ~~Main Feedwater Isolation Valves (MFIVs) and~~ Main Feedwater Regulation Valves (MFRVs) ~~[~~and MFRV~~Associated~~ Bypass Valves~~]~~

PA3.7-118

LCO 3.7.3 ~~[Four] MFIVs, TWO[four]~~ MFRVs~~,~~ ~~[~~and TWO MFRV~~associated~~ bypass valves~~]~~ shall be OPERABLE.

PA3.7-119

APPLICABILITY: MODES 1, 2, ~~[~~and 3~~] except when MFIV, MFRV, [or associated bypass valve] is closed and [de-activated] [or isolated by a closed manual valve]~~.

PA3.7-121

ACTIONS

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

1. Separate Condition entry is allowed for each valve.

2. LCO 3.0.4 is not applicable.

PA3.7-122

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A. One or more MFIVs inoperable.~~	~~A.1 Close or isolate MFIV.~~	~~[72] hours~~
	~~AND~~	
	~~A.2 Verify MFIV is closed or isolated.~~	~~Once per 7 days~~

PA3.7-118

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A~~B. One or both~~more~~ MFRVs inoperable.	~~A~~B.1 Close and place in manual or isolate flow through MFRV(s).	~~[~~72~~]~~ hours
	AND	
	~~A~~B.2 Verify MFRV(s) ~~is~~ closed and in manual or flow through MFRV(s) isolated.	Once per 7 days PA3.7-119 PA3.7-121

(continued)

~~B~~C. One or both~~more~~ ~~[~~MFRV ~~or preheater]~~ bypass valves inoperable.	~~B~~C.1 Close and place in manual or isolate flow through bypass valve(s).	~~[~~72~~]~~ hours PA3.7-119 PA3.7-121
	AND	
	~~B~~C.2 Verify bypass valve(s) ~~is~~ closed and in manual or flow through valve(s) isolated.	Once per 7 days
~~D. Two valves in the same flow path inoperable.~~	~~D.1 Isolate affected flow path.~~	~~8 hours~~ CL3.7-123

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C~~E~~. Required Action and associated Completion Time not met.	C~~E~~.1 Be in MODE 3.	6 hours
	AND	
	C~~E~~.2 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Verify the isolation ~~closure~~ time of each ~~MFIV,~~ MFRV [~~,~~ and MFRV ~~associated~~ bypass valve] is within limits~~s [7] seconds on an actual or simulated actuation signal~~.	In accordance with the [Inservice Testing Program ~~or [18] months~~] TA3.7-117 PA3.7-120
SR 3.7.3.2	Verify each MFRV and MFRV bypass valve actuates to the isolation position on an actual or simulated actuation signal.	24 months TA3.7-117 X3.7-137

3.7 PLANT SYSTEMS

3.7.4 Steam Generator (SG) Power Operated Relief Valves (PORVs)~~Atmospheric Dump Valves (ADVs)~~ CL3.7-124

LCO 3.7.4 Two SG PORVs~~[Three] ADV lines~~ shall be OPERABLE. CL3.7-124

APPLICABILITY: MODES 1, 2, and 3~~,~~ CL3.7-125
~~MODE 4 when steam generator is relied upon for heat removal~~.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SG PORV~~required ADV line~~ inoperable.	A.1 --------NOTE--------- LCO 3.0.4 is not applicable. ---------- Restore SG PORV ~~required ADV line~~ to OPERABLE status.	7 days CL3.7-124
B. Two SG PORVs~~or more required ADV lines~~ inoperable.	B.1 Restore one SG PORV~~ADV line~~ to OPERABLE status.	24 hours CL3.7-124

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours
	AND	CL3.7-125
	C.2 Be in MODE 4~~ without reliance upon steam generator for heat removal~~.	12~~[18]~~ hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify one complete cycle of each SG PORV~~ADV~~.	In accordance with the Inservice Testing Program~~[18] months~~ CL3.7-124 X3.7-130
~~SR 3.7.4.2~~	~~Verify one complete cycle of each ADV block valve.~~	~~[18] months~~ CL3.7-126

3.7 PLANT SYSTEMS

3.7.5 Auxiliary Feedwater (AFW) System

PA3.7-127

CL3.7-128

LCO 3.7.5 [Two~~[Three]~~ AFW trains shall be OPERABLE.

NOTE

AFW train(s) may be considered OPERABLE during alignment and operation for steam generator level control, if it is capable of being manually realigned to the AFW mode of operation. ~~Only one AFW train, which includes a motor-driven pump, is required to be OPERABLE in MODE 4.~~

CL3.7-129

APPLICABILITY: MODES 1, 2, and 3~~,~~
~~MODE 4 when steam generator is relied upon for heat removal~~.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One steam supply to turbine driven AFW pump inoperable. OR NOTE Only applicable if MODE 2 has not been entered following refueling. One turbine driven AFW pump inoperable in MODE 3 following refueling.	A.1 Restore affected equipment~~steam supply~~ to OPERABLE status.	7 days ~~AND~~ ~~10 days from discovery of failure to meet the LCO~~ CL3.7-131 TA3.7-150
B. One AFW train inoperable ~~in MODE 1, 2 or 3 [~~for reasons other than Condition A~~]~~.	B.1 Restore AFW train to OPERABLE status.	72 hours ~~AND~~ ~~10 days from discovery of failure to meet the LCO~~ CL3.7-129 CL3.7-131

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time for Condition A [or B] not met. ~~OR~~ ~~Two AFW trains inoperable in MODE 1, 2, or 3.~~	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	6 hours [12[~~18~~] hours CL3.7-132 CL3.7-133
D. [Two[~~Three~~] AFW trains inoperable ~~in MODE 1, 2, or 3~~.	D.1 ---------NOTE-------- LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status. ---------- Initiate action to restore one AFW train to OPERABLE status.	Immediately CL3.7-133
~~E. Required AFW train inoperable in MODE 4.~~	~~E.1 Initiate action to restore AFW train to OPERABLE status.~~	~~Immediately~~ CL3.7-129

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	----------NOTE---------- AFW train(s) may be considered OPERABLE during alignment and operation for steam generator level control if it is capable of being manually realigned to the AFW mode of operation. ---------- Verify each AFW manual, power operated, and automatic valve in each water flow path, ~~[~~and in both steam supply flow paths to the steam turbine driven pump,~~]~~ that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days TA3.7-136
SR 3.7.5.2	~~[~~----------NOTE---------- Not required to be performed for the turbine driven AFW pump until prior to exceeding 10 % RTP or within ~~[~~724 hours~~]~~ after RCS temperature > 350 °F~~, [1000] psig in the steam generator~~. ----------~~]~~ Verify the developed head of each AFW pump at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program~~[31] days on a STAGGERED TEST BASIS~~ CL3.7-134 TA3.7-135

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.5.3	----------NOTE---------- AFW train(s) may be considered OPERABLE during alignment and operation for steam generator level control, if it is capable of being manually realigned to the AFW mode of operation. ~~Not applicable in MODE 4 when steam generator is relied upon for heat removal.~~ ---------- Verify each AFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	24~~[18]~~ months TA3.7-136 CL3.7-129 X3.7-137

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.5.4	----------NOTES----------	
	~~1. Not required to be performed for the turbine driven AFW pump until [24 hours] after ≥ [1000] psig in the steam generator.~~	TA3.7-136
	2. AFW train(s) may be considered OPERABLE during alignment and operation for steam generator level control, if it is capable of being manually realigned to the AFW mode of operation. ~~Not applicable in MODE 4 when steam generator is relied upon for heat removal.~~	CL3.7-138 X3.7-137

	Verify each AFW pump starts automatically on an actual or simulated actuation signal.	24~~[18]~~months
~~SR 3.7.5.5~~	~~Verify proper alignment of the required AFW flow paths by verifying flow from the condensate storage tank to each steam generator.~~	~~Prior to entering MODE 2, whenever unit has been in MODE 5 or 6 for > 30 days~~ PA3.7-139

3.7 PLANT SYSTEMS

3.7.6 Condensate Storage Tanks (CSTs) CL3.7-141

LCO 3.7.6 The CSTs ~~level~~ shall be OPERABLE~~ ≥ [110,000 gal]~~. TA3.7-142

APPLICABILITY: MODES 1, 2, and 3~~,~~ CL3.7-143
~~MODE 4 when steam generator is relied upon for heat removal~~.

ACTIONS

NOTE
Conditions and Required Actions applicable to both units. CL3.7-141

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CSTs inoperable~~level not within limit~~.	A.1 Verify by administrative means OPERABILITY of backup water supply.	4 hours TA3.7-142 AND Once per 12 hours thereafter
	AND	
	A.2 Restore CSTs ~~level~~ to OPERABLE status ~~within limit~~.	7 days

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	AND	
	B.2 Be in MODE 4~~, without reliance on steam generator for heat removal~~.	[12~~[18]~~ hours CL3.7-143 CL3.7-144

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify ~~the~~ CSTs contents ~~level is~~ ≥ ~~[~~10~~1~~0,000 gal~~]~~ per operating unit.	12 hours CL3.7-141

3.7 PLANT SYSTEMS

3.7.7 Component Cooling Water (CCW) System

PA3.7-145

LCO 3.7.7 Two CCW trains shall be OPERABLE.

PA3.7-145

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

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CCW train inoperable.	A.1	--------NOTE--------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4," for residual heat removal loops made inoperable by CCW. ----------	PA3.7-145
		Restore CCW train to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	----------NOTE---------- Isolation of CCW flow to individual components does not render the CCW System inoperable. ---------- Verify each CCW 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 PA3.7-145
SR 3.7.7.2	----------NOTE---------- This SR only applies to those valves required to align CC System to support the safety injection or recirculation phase of emergency core cooling. ---------- Verify each CCW 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.	CL3.7-140 24~~[18]~~ months PA3.7-145 X3.7-137
SR 3.7.7.3	Verify each CCW pump starts automatically on an actual or simulated actuation signal.	24~~[18]~~ months PA3.7-145 X3.7-137

3.7 PLANT SYSTEMS

3.7.8 Cooling~~Service~~ Water (CL) System ~~(SWS)~~

PA3.7-146

LCO 3.7.8 Two CL~~SWS~~ trains shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. No safeguards CL pumps OPERABLE for one train.	A.1 ----------NOTES---------- 1. Unit 1 enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources—MODES 1, 2, 3, and 4," for emergency diesel generator made inoperable by CL System. 2. Both units enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops—MODE 4," for residual heat removal loops made inoperable by CL System.	CL3.7-147

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B. This Condition may not exist > 7 days in any consecutive 30 day period. ---------- A.1 Restore one safeguards CL pump to OPERABLE status.	CL3.7-147 7 days
BA. One CL supply headerSWS train inoperable.	A.1 --------NOTES------- 1. Unit 1 eEnter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources—MODES 1, 2, 3, and 4 Operating," for emergency diesel generator made inoperable by CL SystemSWS. 2. Both units eEnter applicable Conditions and Required Actions of LCO 3.4.6,"RCS Loops—MODE 4," for residual heat removal loops made inoperable by CL SystemSWS.	CL3.7-148

CONDITION	REQUIRED ACTION	COMPLETION TIME
	B.1 Verify vertical motor driven CL pump OPERABLE.	4 hours CL3.7-148
	AND	
	B.2 Restore CL supply header~~SWS train~~ to OPERABLE status.	72 hours PA3.7-146
~~C~~B. Required Action and associated Completion Time~~ of Condition A~~ not met.	----------NOTE---------- Applicable to both units. ----------	CL3.7-149
	~~C~~B.1 Be in MODE 3.	6 hours
	AND	
	~~C~~B.2 Be in MODE 5.	36 hours
D. Diesel driven CL pumps stored fuel oil supply < 19,500 gal and > 17,000 gal.	D.1 Restore fuel oil supply to within limits.	PA3.7-159 48 hours

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTIONS (continued)		
E. Diesel driven CL pumps stored fuel oil supply < 17,000 gal. OR Required Action and associated Completion Time of Condition D not met.	E.1 Declare diesel driven CL pumps inoperable.	PA3.7-159 Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	----------NOTE---------- Isolation of CLSWS flow to individual components does not render the CL SystemSWS inoperable. ---------- Verify each CL SystemSWS 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.	PA3.7-146 31 days
SR 3.7.8.2	Verify each diesel driven CL pump starts and assumes load within one minute.	CL3.7-151 31 days

SURVEILLANCE		FREQUENCY
SR 3.7.8.3	Verify stored diesel driven CL pumps fuel oil supply ≥ 19,500 gal.	PA3.7-159 31 days
SR 3.7.8.4	Verify OPERABILITY of vertical motor driven CL pump.	CL3.7-151 92 days
SR 3.7.8.52	Verify each CL SystemSWS automatic valve required to mitigate accidents ~~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.	24[~~18~~] months CL3.7-146 CL3.7-152 X3.7-137
SR 3.7.8.63	Verify ~~each~~ the diesel driven and vertical motor driven CLSWS pumps starts automatically on an actual or simulated actuation signal.	24[~~18~~] months PA3.7-146 CL3.7-153 X3.7-137

3.7 PLANT SYSTEMS

3.7.9 Emergency Cooling Water (CL) Supply~~Ultimate Heat Sink (UHS)~~ CL3.7-154

LCO 3.7.9 The Emergency CL Supply~~UHS~~ shall be OPERABLE. CL3.7-154

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

ACTIONS

----------NOTE----------
Conditions and Required Actions applicable to both units.
---------- CL3.7-155

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One safeguards traveling screen inoperable.	A.1 ----------NOTE---------- Not applicable during periods of testing for < 24 hours. ---------- Verify one emergency bay sluice gate open. CL3.7-156	4 hours
	AND	
	A.2 Restore safeguards traveling screen to OPERABLE status.	90 days

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Both safeguards traveling screens inoperable.	B.1 Verify one emergency bay sluice gate open.	1 hour CL3.7-156
	AND	
	B.2 Restore one safeguards traveling screen to OPERABLE status.	7 days
~~C~~A. Emergency CL Line inoperable~~One or more cooling towers with one cooling tower fan inoperable~~.	~~C~~A.1 Verify one emergency bay sluice gate open~~Restore cooling tower fan(s) to OPERABLE status~~.	1 hour CL3.7-154 CL3.7-157
	AND	
	~~C~~A.2 Restore Emergency CL Line to OPERABLE status.	7 days

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~D~~B. Required Action and associated Completion Time ~~of Condition A~~ not met. ~~OR~~ ~~UHS inoperable [for reasons other than Condition A].~~	~~D~~B.1 Be in MODE 3. AND ~~D~~B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
~~SR 3.7.9.1~~ Verify safeguards traveling screens OPERABLE ~~water level of UHS is ≥ [562] ft [mean sea level]~~.	92 days ~~[24] hours~~ PA3.7-158
~~SR 3.7.9.2 Verify average water temperature of UHS is ≤ [90]°F.~~	~~24 hours~~ CL3.7-161
~~SR 3.7.9.3 Operate each cooling tower fan for ≥ [15] minutes.~~	~~31 days~~ CL3.7-161

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
~~SR 3.7.9.4 Verify each cooling tower fan starts automatically on an actual or simulated actuation signal.~~	~~[18] months~~ CL3.7-161

3.7 PLANT SYSTEMS

3.7.10 Control Room Special Ventilation~~Emergency Filtration~~ System (CRSVEFS)

PA3.7-162

LCO 3.7.10 Two CRSVEFS trains shall be OPERABLE.

PA3.7-162

APPLICABILITY: MODES 1, 2, 3, and 4. ~~[5, and 6.]~~
During movement of irradiated fuel assemblies~~,~~
~~[During CORE ALTERATIONS]~~.

CL3.7-164
TA3.7-165

ACTIONS

NOTE
Conditions and Required Actions applicable to both units.

PA3.7-163

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CRSVEFS train inoperable.	A.1 Restore CRSVEFS train to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

PA3.7-162

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A not met ~~[in MODE 5 or 6, or]~~ during movement of irradiated fuel assemblies ~~[, or during CORE ALTERATIONS]~~.	C.1 ~~NOTE Place in toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable.~~ Place OPERABLE CRSVEFS train in emergency mode.	Immediately CL3.7-166 CL3.7-164 PA3.7-162 TA3.7-165
	OR	
	~~C.2.1 Suspend CORE ALTERATIONS.~~ ~~AND~~	~~Immediately~~ TA3.7-165
	C.2 ~~[2]~~ Suspend movement of irradiated fuel assemblies.	Immediately
D. Two CRSVEFS trains inoperable ~~[in MODE 5 or 6, or]~~ during movement of irradiated fuel assemblies ~~[, or during CORE ALTERATIONS]~~.	~~D.1 Suspend CORE ALTERATIONS.~~ ~~AND~~	~~Immediately~~ PA3.7-162 TA3.7-165
	D. ~~[2]~~ Suspend movement of irradiated fuel assemblies.	Immediately

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two CRSVEFS trains inoperable in MODE 1, 2, 3, or 4.	E.1 Enter LCO 3.0.3.	Immediately PA3.7-162

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.10.1	Operate each CRSVEFS train ~~for [≥ 10 continuous hours with the heaters operating or (for systems without heaters)~~ ≥ 15 minutes].	31 days PA3.7-162 CL3.7-167
SR 3.7.10.2	Perform required CRSVEFS filter testing in accordance with the ~~[~~Ventilation Filter Testing Program (VFTP)~~]~~.	In accordance with ~~[~~VFTP~~]~~ PA3.7-162
SR 3.7.10.3	Verify each CRSVEFS train actuates on an actual or simulated actuation signal.	24~~[18]~~ months PA3.7-162 X3.7-137
SR 3.7.10.4	Verify the~~one~~ CRSVEFS fan in each train delivers 3600 to 4400 cfm~~can maintain a positive pressure of ≥ [0.125] inches water gauge, relative to the adjacent [turbine building] during the pressurization mode of operation at a makeup flow rate of ≤ [3000] cfm~~.	24~~[18]~~ months on a STAGGERED TEST BASIS CL3.7-168 X3.7-137

3.7 PLANT SYSTEMS

3.7.11 Safeguards Chilled Water System (SCWS)~~Control Room Emergency Air Temperature Control System (CREATCS)~~ PA3.7-169

LCO 3.7.11 Two SCWS~~CREATCS~~ loops~~trains~~ shall be OPERABLE. PA3.7-169

APPLICABILITY: MODES 1, 2, 3, and 4, ~~[5, and 6,]~~
During movement of irradiated fuel assemblies~~,~~
~~[During CORE ALTERATIONS]~~. PA3.7-171 TA3.7-165

ACTIONS

NOTE
Conditions and Required Actions applicable to both units. PA3.7-171

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SCWS~~CREATCS~~ loop~~train~~ inoperable.	A.1 Restore SCWS~~CREATCS~~ loop~~train~~ to OPERABLE status.	30 days PA3.7-169
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A not met ~~[in MODE 5 or 6, or]~~ during movement of irradiated fuel assemblies ~~[, or during CORE ALTERATIONS]~~.	C.1 Place OPERABLE SCWS~~CREATCS~~ loop~~train~~ in operation.	Immediately PA3.7-169 PA3.7-171
	OR	
	~~C.2.1 Suspend CORE ALTERATIONS.~~	~~Immediately~~ TA3.7-165
	~~AND~~	
	C.2.~~[2]~~ Suspend movement of irradiated fuel assemblies.	Immediately
D. Two SCWS~~CREATCS~~ loops~~trains~~ inoperable ~~[in MODE 5 or 6, or]~~ during movement of irradiated fuel assemblies ~~[, or during CORE ALTERATIONS]~~.	~~D.1 Suspend CORE ALTERATIONS.~~	~~Immediately~~ PA3.7-169 TA3.7-165 PA3.7-171
	~~AND~~	
	D.1~~[2]~~ Suspend movement of irradiated fuel assemblies.	Immediately
E. Two SCWS~~CREATCS~~ loops ~~trains~~ inoperable in MODE 1, 2, 3, or 4.	E.1 Enter LCO 3.0.3.	Immediately PA3.7-169

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Verify each SCWS loop actuates on an actual or simulated actuation signal~~CREATCS train has the capability to remove the assumed heat load~~.	24~~[18]~~ months on a STAGGERED TEST BASIS PA3.7-170
SR 3.7.11.2	Verify SCWS components OPERABLE in accordance with the Inservice Testing Program.	In accordance with the Inservice Testing Program PA3.7-170

3.7 PLANT SYSTEMS

3.7.12 Auxiliary Building Special Ventilation~~Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup~~System (ABSVS~~PREACS~~)

PA3.7-172

LCO 3.7.12 Two ABSVS~~ECCS PREACS~~ trains shall be OPERABLE.

PA3.7-172

NOTE
The ABSV boundary may be opened under administrative control.

CL3.7-174

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

ACTIONS

NOTE
Conditions and Required Actions applicable to both units.

CL3.7-173

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ABSVS~~ECCS PREACS~~ train inoperable.	A.1 Restore ABSVS~~ECCS PREACS~~ train to OPERABLE status.	7 days PA3.7-172
B. Two ABSVS trains inoperable due to inoperable ABSVS boundary.	B.1 Restore ABSVS boundary to OPERABLE status.	CL3.7-174 24 hours

CONDITION	REQUIRED ACTION	COMPLETION TIME
C~~B~~ Required Action and associated Completion Time not met.	C~~B~~.1 Be in MODE 3. AND C~~B~~.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.12.1	Operate each ABSVS~~ECCS PREACS~~ train for ~~[~~≥ 10 ~~continuous~~ hours with the heaters operating ~~or (for systems without heaters) ≥ 15 minutes]~~.	31 days PA3.7-172 CL3.7-175
SR 3.7.12.2	Perform required ABSVS~~ECCS PREACS~~ filter testing in accordance with the ~~[~~Ventilation Filter Testing Program (VFTP)~~]~~.	In accordance with the ~~[~~VFTP~~]~~ PA3.7-172
SR 3.7.12.~~4~~3	Verify each ABSVS~~ECCS PREACS~~ train actuates on an actual or simulated actuation signal.	24~~[18]~~ months PA3.7-172 X3.7-137
SR 3.7.12.~~3~~4	Verify each~~one~~ ABSVS~~ECCS PREACS~~ train can produce~~maintain~~ a negative pressure within 6 minutes after initiation~~≤ [-0.125] inches water gauge relative to atmospheric pressure during the [post accident] mode of operation at a flow rate of ≤ [3000] cfm~~.	92 days~~[18] months on a STAGGERED TEST BASIS~~ PA3.7-172 CL3.7-176

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
~~SR 3.7.12.5 Verify each ECCS PREACS filter bypass damper can be closed.~~	~~[18] months~~ CL3.7-177

3.7 PLANT SYSTEMS

3.7.13 Spent Fuel Pool Special Ventilation~~Building Air Cleanup~~ System (SFPSVS)~~(FBACS)~~

PA3.7-178

LCO 3.7.13 Two SFPSVS~~FBACS~~ trains shall be OPERABLE.

PA3.7-178

APPLICABILITY: ~~[MODES 1, 2, 3, and 4.]~~
During movement of irradiated fuel assemblies in the spent fuel pool enclosure~~building~~.

CL3.7-181
CL3.7-182

ACTIONS

NOTE
LCO 3.0.3 is not applicable.

TA3.7-183

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SFPSVS~~FBACS~~ train inoperable.	A.1 Restore SFPSVS~~FBACS~~ train to OPERABLE status.	7 days

PA3.7-178

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.~~ ~~OR~~ ~~Two FBACS trains inoperable in MODE 1, 2, 3, or 4.~~	~~B.1 Be in MODE 3.~~ ~~AND~~ ~~B.2 Be in MODE 5.~~	~~6 hours~~ ~~36 hours~~
B~~C~~. Required Action and associated Completion Time ~~[~~of Condition A~~]~~ not met~~during movement of irradiated fuel assemblies in the fuel building~~.	B~~C~~.1 Place OPERABLE SFPSVS~~FBACS~~ train in operation. OR B~~C~~.2 Suspend movement of irradiated fuel assemblies in the spent fuel pool enclosure~~building~~.	Immediately Immediately
C~~D~~. Both~~Two~~ SFPSVS~~FBACS~~ trains inoperable~~during movement of irradiated fuel assemblies in the fuel building~~.	C~~D~~.1 Suspend movement of irradiated fuel assemblies in the spent fuel pool enclosure~~building~~.	Immediately

CL3.7-181

PA3.7-178
CL3.7-181

PA3.7-178
CL3.7-181

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.13.1	Operate each SFPSVS~~FBACS~~ train for [≥ 10 ~~continuous~~ hours with the heaters operating ~~or (for systems without heaters) ≥ 15 minutes~~].	31 days PA3.7-178 CL3.7-184
SR 3.7.13.2	Perform required SFPSVS~~FBACS~~ filter testing in accordance with the [Ventilation Filter Testing Program (VFTP)].	In accordance with the [VFTP] PA3.7-178
[SR 3.7.13.3	Verify each SFPSVS~~FBACS~~ train actuates on an actual or simulated actuation signal.	24[~~18~~] months] PA3.7-178 X3.7-137
SR 3.7.13.4	Verify the~~one~~ SFPSVS~~FBACS~~ fan in each train delivers 4680 to 5720 cfm~~can maintain a pressure ≤ [-0.125] inches water gauge with respect to atmospheric pressure during the [post accident] mode of operation at a flow rate ≤ [20,000] cfm~~.	24[~~18~~] months on a STAGGERED TEST BASIS PA3.7-178 CL3.7-185 X3.7-137
[~~SR 3.7.13.5~~	~~Verify each FBACS filter bypass damper can be closed.~~	~~[18] months~~] CL3.7-177

~~3.7 PLANT SYSTEMS~~

CL3.7-186

~~3.7.14 Penetration Room Exhaust Air Cleanup System (PREACS)~~

~~LCO 3.7.14 Two PREACS trains shall be OPERABLE.~~

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

~~ACTIONS~~

~~CONDITION~~	~~REQUIRED ACTION~~	~~COMPLETION TIME~~
~~A. One PREACS train inoperable.~~	~~A.1 Restore PREACS train to OPERABLE status.~~	~~7 days~~
~~B. Required Action and associated Completion Time not met.~~	~~B.1 Be in MODE 3.~~ ~~AND~~ ~~B.2 Be in MODE 5.~~	~~6 hours~~ ~~36 hours~~

~~SURVEILLANCE REQUIREMENTS~~

~~SURVEILLANCE~~	~~FREQUENCY~~
~~SR 3.7.14.1 Operate each PREACS train for [≥ 10 continuous hours with heaters operating or (for systems without heaters) ≥ 15 minutes].~~	~~31 days~~

SURVEILLANCE REQUIREMENTS (continued)

~~SURVEILLANCE~~		~~FREQUENCY~~
~~SR 3.7.14.2~~	~~Perform required PREACS filter testing in accordance with the [Ventilation Filter Testing Program (VFTP)].~~	~~In accordance with the [VFTP]~~
~~SR 3.7.14.3~~	~~Verify each PREACS train actuates on an actual or simulated actuation signal.~~	~~[18] months~~
~~SR 3.7.14.4~~	~~Verify one PREACS train can maintain a pressure ≤ [-0.125] inches water gauge relative to atmospheric pressure during the [post accident] mode of operation at a flow rate of ≤ [3000] cfm.~~	~~[18] months on a STAGGERED TEST BASIS~~
~~SR 3.7.14.5~~	~~Verify each PREACS filter bypass damper can be closed.~~	~~[18] months~~

3.7 PLANT SYSTEMS

CL3.7-187

3.7.14~~8~~ Secondary Specific Activity

LCO 3.7.14~~8~~ The specific activity of the secondary coolant shall be ≤ ~~[~~0.10~~]~~ μCi/gm DOSE EQUIVALENT I-131.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Specific activity not within limit.	A.1 Be in MODE 3.	6 hours
	AND	
	A.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.14~~8~~.1	Verify the specific activity of the secondary coolant is ≤ ~~[~~0.10~~]~~ μCi/gm DOSE EQUIVALENT I-131.	31 days

3.7 PLANT SYSTEMS

3.7.15 Spent Fuel Storage Pool Water Level

PA3.7-178

LCO 3.7.15 The spent fuel storage pool water level shall be ≥ 23 ft over the top of irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: During movement of irradiated fuel assemblies in the spent fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Spent fuel storage pool water level not within limit.	A.1 --------NOTE--------- LCO 3.0.3 is not applicable. ---------- Suspend movement of irradiated fuel assemblies in the spent fuel storage pool.	Immediately

PA3.7-178

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.15.1	Verify the spent fuel storage pool water level is ≥ 23 ft above the top of the irradiated fuel assemblies seated in the storage racks.	7 days PA3.7-178

3.7 PLANT SYSTEMS

3.7.16 Spent Fuel Storage Pool Boron Concentration

PA3.7-178

LCO 3.7.16 The spent fuel storage pool boron concentration shall be ≥ 1800~~[2300]~~ ppm. PA3.7-188

APPLICABILITY: When fuel assemblies are stored in the spent fuel storage pool ~~and a fuel storage pool verification has not been performed since the last movement of fuel assemblies in the fuel storage pool~~. CL3.7-189

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Spent ~~f~~Fuel storage pool boron concentration not within limit.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- PA3.7-178	
	A.1 Suspend movement of fuel assemblies in the spent fuel storage pool.	Immediately
	AND	
	A.2~~.1~~ Initiate action to restore spent fuel storage pool boron concentration to within limit. CL3.7-189	Immediately
	~~OR~~	
	~~A.2.2 Verify by administrative means [Region 2] fuel storage pool verification has been performed since the last movement of fuel assemblies in the fuel storage pool.~~	~~Immediately~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify the spent fuel storage pool boron concentration is within limit.	7 days

PA3.7-178

3.7 PLANT SYSTEMS

3.7.17 Spent Fuel Pool~~Assembly~~ Storage

TA3.7-194

LCO 3.7.17 The combination of initial enrichment, ~~and~~ burnup and decay time of each ~~spent~~ fuel assembly stored in the spent fuel pool~~[Region 2]~~ shall be within the Unrestricted Region~~Acceptable [Burnup Domain]~~ of Figure 3.7.17-1 or Figure 3.7.17-2, as applicable, or in accordance with Specification 4.3.1.1.

CL3.7-191
TA3.7-194

APPLICABILITY: Whenever any fuel assembly is stored in ~~[Region 2] of~~ the spent fuel storage pool.

CL3.7-191

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of the LCO not met.	A.1 --------NOTE--------- LCO 3.0.3 is not applicable. ---------- Initiate action to move the noncomplying fuel assembly to an acceptable location~~from [Region 2]~~.	Immediately

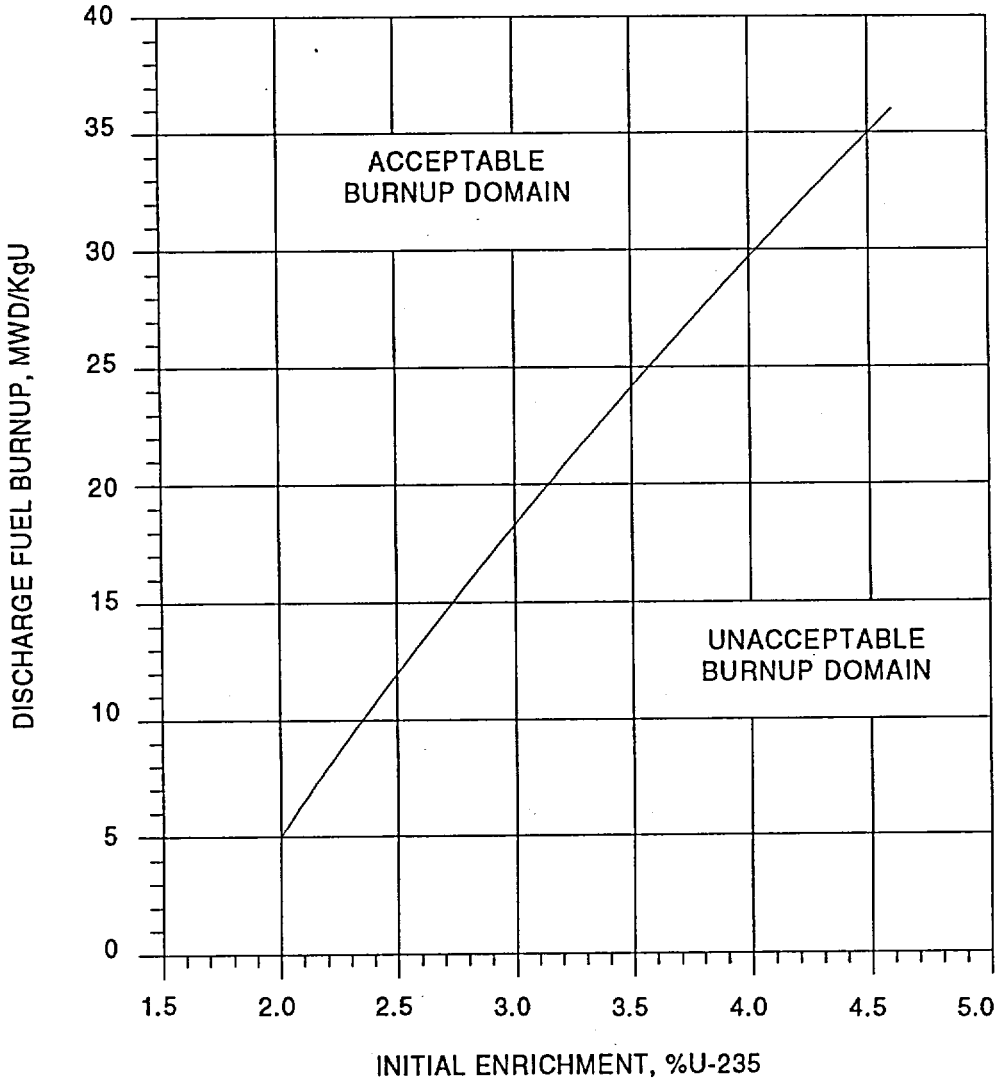
CL3.7-191

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.17.1	Verify by administrative means the initial enrichment, ~~and~~ burnup and decay time of the fuel assembly is in accordance with Figure 3.7.17-1 or Figure 3.7.17-2, as applicable, or Specification 4.3.1.1.	Prior to storing or moving the fuel assembly ~~in [Region 2]~~ CL3.7-191
SR 3.7.17.2	Verify spent fuel pool inventory	Within 7 days after completion of a spent fuel pool fuel handling campaign CL3.7-190

~~This Figure is Deleted~~

CL3.7-192



Not to be used for Operation.
For illustration purposes only.

Figure 3.7.17-1 (page 1 of 1)
Fuel Assembly Burnup Limits in Region 2

CL3.7-192

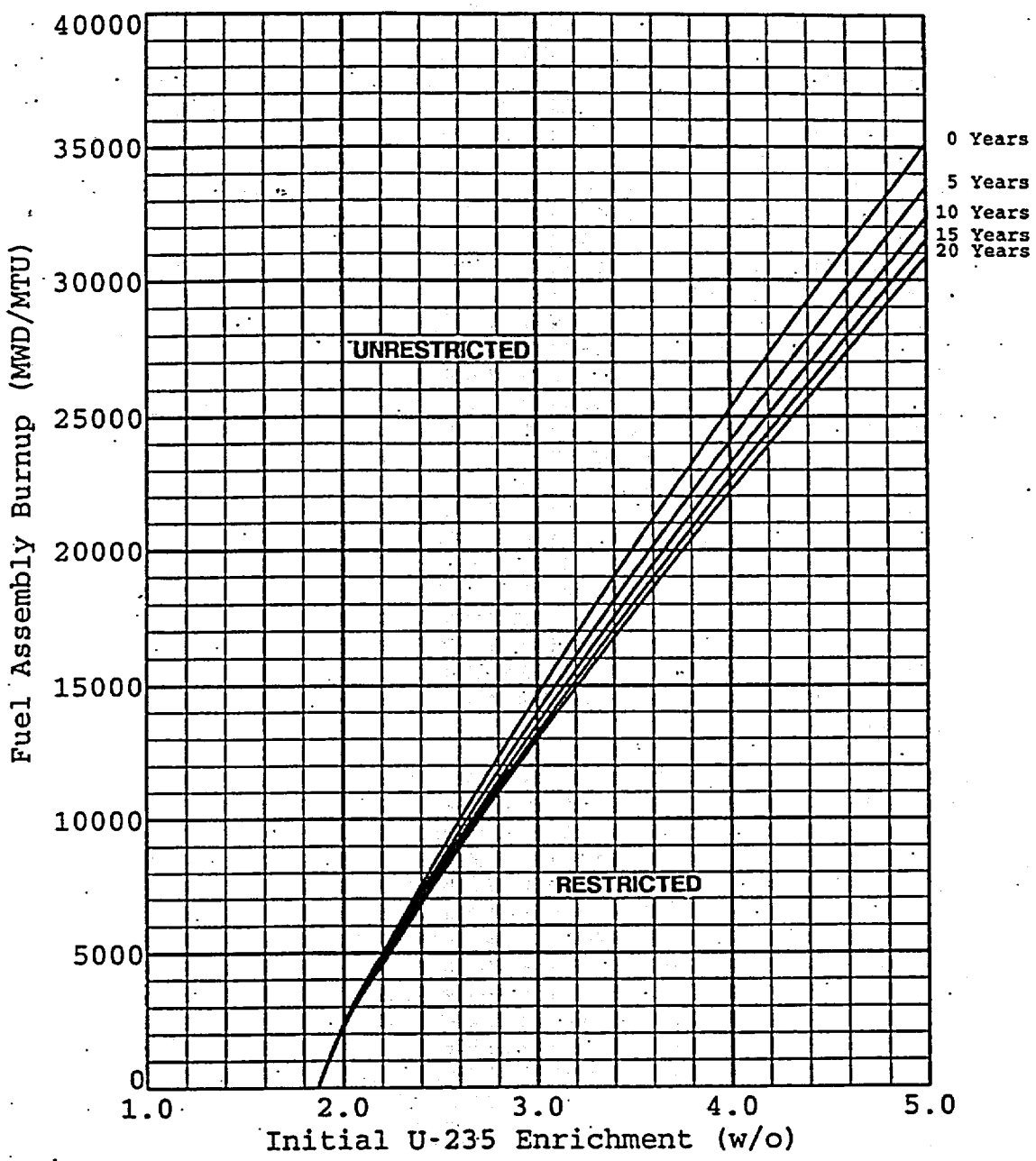


Figure 3.7.17-1
Spent Fuel Pool Unrestricted Region Burnup and Decay Time Requirements-OFA Fuel

CL3.7-192

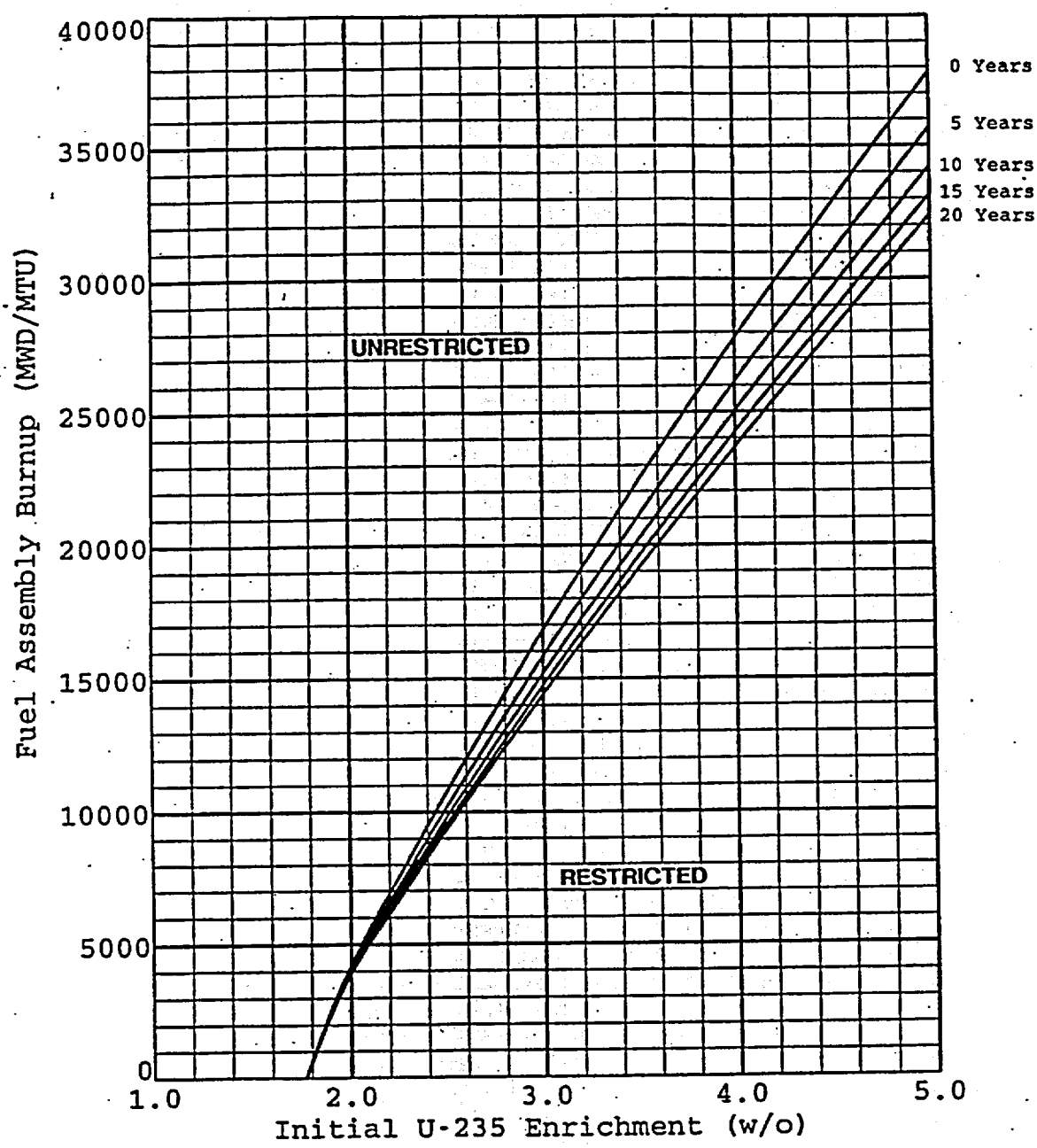


Figure 3.7.17-2

Spent Fuel Pool Unrestricted Region Burnup and Decay Time Requirements-STD Fuel

B 3.7 PLANT SYSTEMS

B 3.7.1 Main Steam Safety Valves (MSSVs)

PA3.7-201

BASES

BACKGROUND

The primary purpose of the MSSVs is to provide overpressure protection for the secondary system. The MSSVs also provide protection against overpressurizing the reactor coolant pressure boundary (RCPB) by providing a heat sink for the removal of energy from the Reactor Coolant System (RCS) if the preferred heat sink, provided by the Condenser and Circulating Water System, is not available.

Five MSSVs are located on each main steam header, outside containment, upstream of the main steam isolation valves, as described in the UFSAR~~, Section [10.3.1]~~ (Ref. 1). The MSSVs must have sufficient capacity to limit the secondary system pressure to ≤ ~~criteria is 110% of rated steam flow at~~ 110% of the steam generator design pressure in order to~~. This~~ meet the requirements of the ASME Code, Section III (Ref. 2). The MSSV design includes staggered setpoints, according to Table 3.7.1-1~~2~~ in the accompanying LCO, so that only the needed valves will actuate. Staggered setpoints reduce the potential for valve chattering that is due to steam pressure insufficient to fully open all valves following a turbine reactor trip.

TA3.7-202

Normal functioning of a MSSV is expected to involve some "simmering" which does not make the valve inoperable.

PA3.7-203

APPLICABLE SAFETY ANALYSES

The design basis for the MSSVs comes from Reference 2 and its purpose is to limit the secondary system pressure to ≤ 110% of design pressure ~~when passing 100% of design steam flow. This design basis is sufficient to cope with~~ for any anticipated operational occurrence (AOO) or accident considered in the Design Basis Accident (DBA) and

TA3.7-202

PA3.7-201

BASES

APPLICABLE SAFETY ANALYSES (continued)

transient analysis. The accident analysis requires five MSSVs per steam generator to provide overpressure protection for design basis transients occurring at 102% RTP. PA3.7-204

By relieving steam, the MSSVs prevent RCS overpressurization. The limiting events, described in the USAR (Ref. 3), that challenge the relieving capacity of the MSSVs, and thus RCS pressure, are those characterized as decreased heat removal events, ~~which are presented in the FSAR, Section[15.2] (Ref. 3). Of these,~~ such as the full power turbine trip without steam dump ~~is the limiting AOO. This event also terminates normal feedwater flow to the steam generators.~~, and increasing core heat flux events, such as the rod cluster control assembly (RCCA) withdrawal at power. CL3.7-206

The safety analyses demonstrate that the transient response for turbine trip occurring from full power without a direct reactor trip presents no hazard to the integrity of the RCS or the Main Steam System. If a minimum (least negative or most positive) reactivity feedback is assumed, the reactor is tripped on high pressurizer pressure. In this case, the pressurizer safety valves open, and RCS pressure remains below 110% of the design value. The MSSVs also open to limit the secondary steam pressure. TA3.7-202 CL3.7-206

The transient response for the slow and fast RCCA withdrawal at power events also present no hazard to the integrity of the RCS or the Main Steam System. Diverse reactor trip inputs from nuclear instrumentation and pressurizer level and pressure are assumed to shut down the reactor when the associated trip setpoint is reached. In this analysis, the pressurizer safety valves open and RCS pressure remains below 110% of the design value. The MSSVs also open to limit the secondary steam pressure. CL3.7-206

PA3.7-201

BASES

~~ACTIONS (continued)~~

~~B.1 and B.2~~

~~If maximum reactivity feedback is assumed, the reactor is tripped on overtemperature ΔT. The departure from nucleate boiling ratio increases throughout the transient, and never drops below its initial value. Pressurizer relief valves and MSSVs are activated and prevent overpressurization in the primary and secondary systems. The MSSVs are assumed to have two active and one passive failure modes. The active failure modes are spurious opening, and failure to reclose once opened. The passive failure mode is failure to open upon demand.~~

The MSSVs satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii) ~~the NRC Policy Statement~~.

LCO

~~The accident analysis requires four MSSVs per steam generator to provide overpressure protection for design basis transients occurring at 102% RTP. An MSSV will be considered inoperable if it fails to open on demand.~~ PA3.7-204

The LCO requires that five MSSVs per steam generator be OPERABLE in compliance with Reference 2~~, even though this is not a requirement of the DBA analysis. This is because operation with less than the full number of MSSVs requires limitations on allowable THERMAL POWER (to meet ASME Code requirements). These limitations are according to Table 3.7.1-1 in the accompanying LCO, and Required Action A.2.~~ TA3.7-202 TA3.7-202

The OPERABILITY of the MSSVs is defined as the ability to open upon demand within the setpoint tolerances, relieve steam generator overpressure, and ~~reseat~~ close when pressure has been reduced. The OPERABILITY of the MSSVs is determined by periodic surveillance testing in accordance with the Inservice Testing Program.

~~The lift settings, according to Table 3.7.1-2 in the accompanying LCO, correspond to ambient~~ TA3.7-202

PA3.7-201

BASES

~~ACTIONS (continued)~~

~~B.1 and B.2~~

~~conditions of the valve at nominal operating temperature and pressure.~~

LCO (continued)

This LCO provides assurance that the MSSVs will perform their designed safety functions to mitigate the consequences of accidents that could result in a challenge to the RCPB or Main Steam System integrity. TA3.7-202

APPLICABILITY

In MODES 1, 2, and 3 ~~above 40% RTP~~, ~~the number of~~ five MSSVs per steam generator are required to be OPERABLE to prevent Main Steam System overpressurization; ~~must be according to Table 3.7.1-1 in the accompanying LCO. Below 40% RTP in MODES 1, 2, and 3, only two MSSVs per steam generator are required to be OPERABLE.~~ TA3.7-202

In MODES 4, ~~and~~ 5, and 6, there are no credible transients requiring the MSSVs. PA3.7-207

The energy content in the steam generators is sufficiently low ~~are not normally used for heat removal~~ in MODES 5 and 6~~, and thus~~ that they cannot be overpressurized; there is no requirement for the MSSVs to be OPERABLE in these MODES.

ACTIONS

~~The ACTIONS table is modified by a Note indicating that separate Condition entry is allowed for each MSSV.~~ CL3.7-112

A.1

With one ~~or more~~ MSSV~~s~~ inoperable, ~~reduce power~~ restore OPERABILITY of the inoperable MSSV within 4 hours ~~so that the available MSSV relieving capacity meets Reference 2 requirements for the applicable THERMAL POWER~~. CL3.7-111

PA3.7-201

BASES

~~ACTIONS (continued)~~

~~B.1 and B.2~~

Continued oOperation with less than all five MSSVs OPERABLE for each steam generator is not permitted since safety analyses supporting such operation have not been performed. ~~permissible, if THERMAL POWER is proportionally limited to the relief capacity of the remaining MSSVs. This is accomplished by restricting THERMAL POWER so that the energy transfer to the most limiting steam generator is not greater than the available relief capacity in that steam generator. For example, if one MSSV is inoperable in one steam generator, the relief capacity of that steam generator is reduced by approximately 20%. To offset this reduction in relief capacity, energy transfer to that steam generator must be similarly reduced by at least 20%. This is accomplished by reducing THERMAL POWER by at least 20%, which conservatively limits the energy transfer to all steam generators to approximately 80% of total capacity, consistent with the relief capacity of the most limiting steam generator. For each steam generator, at a specified pressure, the fractional relief capacity (FRC) of each MSSV is determined as follows:~~ CL3.7-111

~~where:~~

~~A = the relief capacity of the MSSV; and~~

~~B = the total relief capacity of all the MSSVs of the steam generator.~~

~~The FRC is the relief capacity necessary to address operation with reduced THERMAL POWER.~~

~~The reduced THERMAL POWER levels in the LCO prevent operation at power levels greater than the relief capacity of the remaining MSSVs. The reduced THERMAL POWER is determined as follows:~~ CL3.7-111

PA3.7-201

BASES

~~ACTIONS (continued)~~

~~B.1 and B.2~~

~~where:~~

~~RP = Reduced THERMAL POWER for the most limiting steam generator expressed as a percent of RTP;~~

~~N_1, N_2, ..., N_5 represent the status of the MSSV 1, 2, ..., 5, respectively,~~

~~= 0 if the MSSV is OPERABLE,~~
~~= 1 if the MSSV is inoperable;~~

~~FRC_1, FRC_2, ..., FRC_5 = the relief capacity of the MSSV 1, 2, ..., 5, respectively, as defined above.~~

B.1 and B.2

If the MSSV~~s~~ cannot be restored to OPERABLE status within the associated Completion Time, ~~or if one or more generators have less than two MSSVs OPERABLE,~~ the ~~steam~~ 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 4 within 12 hours. CL3.7-111

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 3.7.1.1

This SR verifies the OPERABILITY of the MSSVs by the verification of each MSSV lift setpoint in accordance with the Inservice Testing Program. The ASME Code, Section XI (Ref. 4), requires that safety and relief valve tests be

PA3.7-201

BASES

~~ACTIONS (continued)~~

~~B.1 and B.2~~

performed in accordance with ANSI/ASME OM-1-1987 (Ref. 5). According to Reference 5, the following tests are required:

a. Visual examination;

b. Seat tightness determination;

c. Setpoint pressure determination (lift setting); and

d. Compliance with owner's seat tightness criteria~~; and~~

~~e. Verification of the balancing device integrity on balanced valves~~. CL3.7-211

The ANSI/ASME Standard requires that all valves be tested every 5 years, and a minimum of 20% of the valves be tested every 24 months. The ASME Code specifies the activities and frequencies necessary to satisfy the requirements. Table 3.7.1-1~~2~~ allows a ± ~~[~~3~~]~~% setpoint tolerance for OPERABILITY; however, the valves are reset to within a nominal ± 1% of their setpoint during the Surveillance~~ to allow for drift~~. The lift settings, according to Table 3.7.1-1, correspond to ambient conditions of the valve at nominal operating temperature and pressure. PA3.7-212 TA3.7-202

This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. The MSSVs may be either bench tested or tested in situ at hot conditions using an assist device to simulate lift pressure. If the MSSVs are not tested at hot conditions, the lift setting pressure shall be corrected to ambient conditions of the valve at operating temperature and pressure.

REFERENCES

1. UFSAR, Section 11.4~~ [10.3.1]~~.

PA3.7-201

BASES

~~ACTIONS (continued)~~

~~B.1 and B.2~~

2. ASME, Boiler and Pressure Vessel Code, Section III, Article NC-7000, Class 2 Components.

3. UFSAR, Section 14.4~~[15.2]~~.

4. ASME, Boiler and Pressure Vessel Code, Section XI.

5. ANSI/ASME OM-1-1987.

B 3.7 PLANT SYSTEMS

B 3.7.2 Main Steam Isolation Valves (MSIVs) PA3.7-201

BASES

BACKGROUND

The MSIVs isolate steam flow from the secondary side of the steam generators following a main steam line break (MSLB) ~~high energy line break (HELB)~~. MSIV closure terminates flow from the unaffected (intact) steam generators. PA3.7-213

One MSIV is located in each main steam line outside, but close to, containment. The MSIVs are downstream from the main steam safety valves (MSSVs) and auxiliary feedwater (AFW) pump turbine steam supply, to prevent MSSV and AFW isolation from the steam generators by MSIV closure. Closing the MSIVs isolates each steam generator from the other~~s~~, and isolates the turbine, Steam Dump~~Bypass~~ System, and other auxiliary steam supplies from the steam generators.

The MSIVs close on a main steam isolation signal generated by any of the following signals:

a. High-High Containment Pressure;
b. High Steam Flow and Low-Low T_{avg} with Safety Injection; and
c. High-High Steam Flow with Safety Injection.

CL3.7-214

~~either low steam generator pressure or high containment pressure.~~

The MSIVs fail closed on loss of ~~control or actuation power~~air.

Each MSIV has a~~n~~ MSIV bypass valve. These valves are normally used for warming steam lines and CL3.7-216

(continued)

PA3.7-201

BASES

equalizing pressure across the MSIVs. ~~Although t~~These bypass valves are normally closed at power~~, they receive the same emergency closure signal as do their associated MSIVs~~. – CL3.7-216

The MSIVs and MSIV bypass valves may ~~also~~ be operated ~~actuated~~ manually. PA3.7-217

In addition to the fast-closing stop valve, each steam line has a downstream non-return check valve (NRCV). The four valves (one MSIV and one NRCV in each of two lines) prevent blowdown of more than one steam generator for any break location even if one valve fails to close. A description of the MSIVs and NRCVs is found in the UFSAR~~, Section [10.3]~~ (Ref. 1). CL3.7-221

APPLICABLE SAFETY ANALYSES

The design basis of the MSIVs is established by the containment analysis for the large steam line break (SLB) inside containment, discussed in the UFSAR~~, Section [6.2]~~ (Ref. 2). ~~It is also affected by the accident analysis of the SLB events presented in the FSAR, Section [15.1.5] (Ref. 3).~~ The design precludes the blowdown of more than one steam generator, assuming a single active component failure (e.g., the failure of one MSIV or NRCV to close ~~on demand~~). CL3.7-222

The limiting case for the containment analysis is the main steam line break (MSLB) inside containment, with ~~a loss of~~ offsite power available following turbine trip, and failure of a safeguards train~~the MSIV on the affected steam generator to close~~. At lower power~~s~~, the steam generator inventory and temperature are at their maximum, maximizing the analyzed mass and energy release to the containment. ~~Due to reverse flow and failure of the MSIV to close, the additional mass and energy in the steam headers downstream from the other MSIV contributes to~~ CL3.7-222

(continued)

PA3.7-201

BASES

~~the total release.~~ With the most reactive rod cluster control assembly assumed stuck in the fully withdrawn position, there is an increased possibility that the core will become critical and return to power. The core is ultimately shut down by the boric acid injection delivered by the Emergency Core Cooling System.

~~The accident analysis compares several different SLB events against different acceptance criteria.~~

The analysis of several different SLB events are performed to demonstrate that the acceptance criteria listed in the USAR are satisfied. CL3.7-222

Events evaluated include:

a. Containment response due to a large SLB inside of containment;

b. Core response due to a large SLB inside of containment;

c. Small SLB; and

d. Core response due to a SLB outside of containment to support the voltage based steam generator tube repair criteria (Ref. 3).

~~MSIV is this short~~

~~The large SLB outside containment upstream of the limiting for offsite dose, although a break in section of main steam header has a very low probability. The large SLB inside containment at hot zero power is the limiting case for a post trip return to power. The analysis includes scenarios with offsite power available, and with a loss of offsite power following turbine trip. With offsite power available, the reactor coolant pumps continue to circulate coolant through the steam generators, maximizing~~ CL3.7-222

(continued)

PA3.7-201

BASES

~~the Reactor Coolant System cooldown. With a loss of offsite power, the response of mitigating systems is delayed. Significant single failures considered include failure of an MSIV to close.~~

The MSIVs serve only a safety function and remain open during power operation. These valves operate under the following situations:

a. ~~An~~ ~~HELB~~MSLB inside containment. ~~In order to maximize the mass and energy release into containment, the analysis assumes that the MSIV in the affected steam generator remains open.~~ For this accident scenario, steam is discharged into containment from ~~all~~both steam generators until the NRCV on the broken line (or MSIV on the intact line) ~~remaining MSIVs~~ closes. After ~~MSIV closure~~the valve closes, steam is discharged into containment only from the affected steam generator and from the residual steam in the main steam header between ~~downstream of~~ the closed ~~MSIVs~~valve and the affected steam generator. ~~in the unaffected loops.~~ Closure of the ~~MSIVs~~NRCV in the affected line (or the MSIV in the intact line) isolates the break from the unaffected steam generator~~s~~. CL3.7-222

b. A break outside of containment and upstream from the MSIVs is not a containment pressurization concern. The uncontrolled blowdown of more than one steam generator must be prevented to limit the potential for uncontrolled RCS cooldown and positive reactivity addition. Closure of the ~~MSIVs~~ NRCV in the affected line (or the MSIV in the intact line) isolates the break and limits the blowdown to a single steam generator. CL3.7-222

(continued)

PA3.7-201

BASES

c. A break downstream of the MSIVs will be isolated by the closure of the MSIVs.

d. Following a steam generator tube rupture, closure of the MSIV~~s~~ downstream of the ruptured steam generator isolates the ruptured steam generator from the intact steam generator~~s~~ to minimize radiological releases. CL3.7-222

~~e. The MSIVs are also utilized during other events such as a feedwater line break. This event is less limiting so far as MSIV OPERABILITY is concerned.~~ CL3.7-222

The MSIVs satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii) ~~the NRC Policy Statement~~.

LCO

This LCO requires that both ~~[four]~~ MSIVs ~~in the steam lines~~ be OPERABLE. The MSIVs are considered OPERABLE when the isolation times are within limits, and they close on a~~n~~ main steam isolation ~~actuation~~ signal. PA3.7-223

This LCO provides assurance that the MSIVs will perform their design safety function to mitigate the consequences of accidents that could result in offsite exposures comparable to the 10 CFR 100 (Ref. 4) limits ~~or the NRC staff approved licensing basis~~. PA3.7-224

APPLICABILITY

The MSIVs must be OPERABLE in MODE 1, and in MODES 2 and 3 except when closed ~~and de-activated, when there is significant mass and energy in the RCS and steam generators~~. When the MSIVs are closed, they are already performing the safety function. CL3.7-115

(continued)

PA3.7-201

BASES

APPLICABILITY (continued)

In MODE 4, normally ~~most of~~ the MSIVs are closed, and the steam generator energy is low. In MODE 5 or 6, the steam generators do not contain much energy because their temperature is below the boiling point of water; therefore, the MSIVs are not required for isolation of potential high energy secondary system pipe breaks in these MODES. PA3.7-114

ACTIONS

A.1

With one MSIV inoperable in MODE 1, action must be taken to restore OPERABLE status within [8] hours. Some repairs to the MSIV can be made with the unit hot. The [8] hour Completion Time is reasonable, considering the low probability of an accident occurring during this time period that would require a closure of the MSIVs and considering the redundancy of the NRCV. CL3.7-221

The [8] hour Completion Time is greater than that normally allowed for containment isolation valves because the MSIVs are valves that isolate a closed system penetrating containment. These valves differ from other containment isolation valves in that the closed system provides an additional passive means for containment isolation.

B.1

If the MSIV cannot be restored to OPERABLE status within [8] hours, 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 MODE 2 within 6 hours and Condition C would be entered unless both MSIVs are closed. The Completion Times are reasonable, based PA3.7-229 PA3.7-226

(continued)

PA3.7-201

BASES

on operating experience, to reach MODE 2 ~~and to close the MSIVs~~ in an orderly manner ~~and~~ without challenging unit systems.

C.1 and C.2

~~Condition C is modified by a Note indicating that separate Condition entry is allowed for each MSIV.~~ PA3.7-114

Since the MSIVs are required to be OPERABLE in MODES 2 and 3, the inoperable MSIV~~s~~ may either be restored to OPERABLE status or closed. When closed, the MSIVs are already in the position required by the assumptions in the safety analysis.

~~ACTIONS~~ ~~C.1 and C.2 (continued)~~

The ~~[8]~~ hour Completion Time is consistent with that allowed in Condition A for one MSIV inoperable.

For an inoperable MSIV~~s~~ that cannot be restored to OPERABLE status within the specified Completion Time, but is ~~are~~ closed, the inoperable MSIV~~s~~ must be verified on a periodic basis to be closed. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of MSIV status indications available in the control room, and other administrative controls, to ensure that these valves are in the closed position.

D.1 and D.2

If the MSIVs cannot be restored to OPERABLE status or are not closed within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed at least in

(continued)

PA3.7-201

BASES

MODE 3 within 6 hours, and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from MODE 2 conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1

This SR verifies that MSIV closure time is ≤ 5~~[4.6]~~ seconds ~~on an actual or simulated actuation signal~~. The MSIV isolation~~closure~~ time is assumed in the accident and containment analyses. This Surveillance is normally performed upon returning the unit to operation following a refueling outage. The MSIVs should not be tested at power, since even a part stroke exercise increases the risk of a valve closure when the unit is generating power. As the MSIVs are not tested at power, they are deferred~~exempt~~ from the ASME Code~~, Section XI~~ (Ref. 5)~~.~~ requirements during operation in MODE 1 or 2. Since this test is performed by manually closing the valve, this test also verifies that the MSIV manual switches are functional. TA3.7-117 CL3.7-228

The Frequency is in accordance with the ~~[~~Inservice Testing Program~~ or [18] months]~~. ~~The [18] month Frequency for valve closure time is based on the refueling cycle. 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.~~ TA3.7-117

This test is conducted in MODE 3 with the unit at operating temperature and pressure~~, as discussed in Reference 5 exercising requirements.~~ This SR is modified by a Note that allows entry into and operation in MODE 3 TA3.7-117

(continued)

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BASES

prior to performing the SR. This allows a delay of testing until MODE 3, to establish conditions consistent with those under which the acceptance criterion was generated.

~~SR 3.7.2.2~~

TA3.7-117

This SR verifies each MSIV can close on an actual or simulated main steam isolation signal. This Surveillance is normally performed upon returning the plant to operation following a refueling outage.

The Frequency of MSIV testing is every 24 months. The 24 month Frequency for testing is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed. Therefore, the Frequency is acceptable from a reliability standpoint.

REFERENCES

1. UFSAR, Section 11.7~~[10.3]~~.

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

~~2~~3. UFSAR, Section 14.5~~[15.1.5]~~.

3. License Amendment 133/125, issued November 18, 1997, "Voltage-based Steam Generator Tube Repair Criteria."

4. 10 CFR 100.11.

5. ASME, Boiler and Pressure Vessel Code, Section XI.

B 3.7 PLANT SYSTEMS

B 3.7.3 ~~Main Feedwater Isolation Valves (MFIVs) and~~ Main Feedwater Regulation Valves (MFRVs) ~~[~~and ~~Associated~~ MFRV Bypass Valves~~]~~ PA3.7-201 CL3.7-227

BASES

BACKGROUND

The MFR~~I~~Vs isolate main feedwater (MFW) flow to the secondary side of the steam generators following a steam or feedwater ~~high energy~~ line break ~~(HELB)~~. The key safety significant ~~related~~ functions of the MFRVs ~~is~~ are to prevent: PA3.7-213

a. Overfill of the steam generators; CL3.7-231
b. Excessive cooldown of the Reactor Coolant System; and
c. Overpressurization of the containment following a main feedwater line break (FWLB) or main steam line break (MSLB).

~~provide the second isolation of MFW flow to the secondary side of the steam generators following an HELB.~~

Closure of the ~~MFIVs and associated bypass valves or~~ MFRVs and associated bypass valves terminates flow to the steam generators, terminating the event for feedwater line breaks (FWLBs) occurring down~~up~~stream of the main feedwater isolation valves (MFIVs) or MFRVs. Credit is taken for only the MFRVs and the MFRV bypass valves since the closure times are shorter than those of the MFIVs. The MFIVs are treated solely as containment isolation valves in accordance with LCO 3.6.3, "Containment Isolation Valves." Check valves in the feedwater lines terminate FWLBs upstream of the MFIVs and MFRVs. The consequences of events occurring in the main steam lines or in the MFW lines downstream from the MFR~~I~~Vs will be mitigated by their closure. Closure of the ~~MFIVs and associated bypass valves, or~~ MFRVs and ~~associated~~MFRV bypass valves~~,~~ effectively terminates the addition of CL3.7-231

(continued)

PA3.7-201 CL3.7-227

BASES

feedwater to an affected steam generator, limiting the mass and energy release for steam line breaks (SLBs) or FWLBs inside containment, and reducing the cooldown effects for SLBs.

The ~~MFIVs and associated bypass valves, or~~ MFRVs~~,~~ ~~and associated~~MFRV bypass valves, and piping upstream of the MFIVs are ~~isolate the~~ nonsafety related ~~portions from the safety related portions of the system~~. In the event of a secondary side pipe rupture inside containment, the MFRVs, MFRV bypass valves, check valves and the main feedwater pump trip limit the quantity of high energy fluid that enters containment through the break, and provide a pressure boundary for the controlled addition of auxiliary feedwater (AFW) to the intact loops. CL3.7-231

One ~~MFIV and associated bypass valve, and one~~ MFRV and its ~~associated~~ MFRV bypass valve~~,~~ are located on each MFW line, outside but close to containment. The ~~MFIVs and~~ check valves ~~MFRVs~~ are located upstream of the AFW injection point so that AFW may be supplied to the steam generators following MFIV or MFRV closure. The piping volume from these valves to the steam generators must be accounted for in calculating mass and energy releases. This line must be~~,~~ ~~and~~ refilled prior to AFW reaching the steam generator following either an SLB or FWLB.

The ~~MFIVs and associated bypass valves, and~~ MFRVs and ~~associated~~MFRV bypass valves~~,~~ close due to the following automatic feedwater isolation (FWI) signals: CL3.7-214

a. ~~on receipt of a~~ Low T_{avg} ~~Low~~ coincident with reactor trip (P-4) (MFRV only); ~~or~~

(continued)

PA3.7-201 CL3.7-227

BASES

b. ~~S~~steam generator water level – high high signal; and
c. Safety injection.

CL3.7-214

They MFRVs and MFRV bypass valves may also be operated ~~actuated~~ manually.

In addition to the MFIVs~~ and associated bypass valves~~, ~~and~~ the MFRVs and MFRV~~associated~~ bypass valves, a check valve inside containment is available. The check valve isolates the feedwater line, penetrating containment, and ensures that the consequences of events do not exceed the capacity of the containment heat removal systems.

A description of the ~~MFIVs and~~ MFRVs is found in the UFSAR~~, Section [10.4.7]~~ (Ref. 1).

APPLICABLE SAFETY ANALYSES

The design basis of the ~~MFIVs and~~ MFRVs is established by the analyses for the large Main Steam Line Break (MSLB). ~~It is also influenced by the accident analysis for the large FWLB.~~ Closure of the ~~MFIVs and associated bypass valves, or~~ MFRVs and associated bypass valves, and trip of the main feedwater pumps may ~~also~~ be relied on to terminate feedwater flow during ~~an~~ MSLB for the core ~~response analysis~~ and containment response analyses~~excess feedwater event upon the receipt of a steam generator water level – high high signal or a feedwater isolation signal on high steam generator level~~.

CL3.7-232

The MSLB core and containment response analyses bound the accident analysis for the large FWLB. Some leakage through the MFRVs and associated bypass valves is anticipated when control board instrumentation indicates

CL3.7-232

(continued)

PA3.7-201 CL3.7-227

BASES

that the valves have closed. This leakage has been conservatively bounded by the MSLB analyses. CL3.7-232

Failure of a~~n MFIV,~~ MFRV~~,~~ or the ~~associated~~MFRV bypass valves to close following a~~n~~ MSLB ~~or FWLB~~ can result in additional mass and energy being delivered to the steam generators, contributing to cooldown. This failure also results in additional mass and energy releases following a~~n~~ MSLB or FWLB event.

The ~~MFIVs and~~ MFRVs satisfy Criterion 3 of 10 CFR 50.36 (c)(2)(ii)~~the NRC Policy Statement~~.

LCO

This LCO ensures that the ~~MFIVs,~~ MFRVs~~,~~ and the~~ir~~ ~~associated~~MFRV bypass valves will isolate MFW flow to the steam generators, following a~~n~~ FWLB or MSLB~~main steam line break~~. ~~These valves will also isolate the nonsafety related portions from the safety related portions of the system.~~ PA3.7-233

This LCO requires that ~~[four] MFIVs and associated bypass valves and~~ two~~[four]~~ MFRVs [and associated MFRV bypass valves] be OPERABLE. The ~~MFIVs and~~ MFRVs and the associated MFRV bypass valves are considered OPERABLE when feedwater isolation times are within limits and they close on a~~n~~ FWI~~isolation actuation~~ signal. When control board instrumentation indicates that these valves have fully closed, the valves are OPERABLE since leakage through the closed valves has been conservatively bounded by the MSLB analyses, and therefore, they are performing their safety function. PA3.7-234

LCO (continued)

Failure to meet the LCO requirements can result in additional mass and energy being released to containment following an SLB or FWLB inside containment. Since~~If~~ a

(continued)

PA3.7-201 CL3.7-227

BASES

feedwater isolation signal on high steam generator level is relied on to terminate an excess feedwater flow event, failure to meet the LCO may result in the introduction of water into the main steam lines.

APPLICABILITY

The ~~MFIVs and~~ MFRVs and the ~~associated~~MFRV bypass valves must be OPERABLE whenever there is significant mass and energy in the Reactor Coolant System and steam generators. ~~This ensures that, in the event of an HELB, a single failure cannot result in the blowdown of more than one steam generator.~~ In MODES 1, 2, [and 3], the ~~MFIVs and~~ MFRVs and the ~~associated~~MFRV bypass valves are required to be OPERABLE to limit the amount of available fluid that could be added to containment in the case of a secondary system pipe break inside containment. When the valves are closed ~~and/or de-activated or isolated by a closed manual valve~~, they are already performing their safety function. PA3.7-236 PA3.7-121

In MODES 4, 5, and 6, steam generator energy is low. In addition~~Therefore~~, the ~~MFIVs,~~ MFRVs~~,~~ and the ~~associated~~MFRV bypass valves are normally closed since MFW is not required.

ACTIONS

The ACTIONS table is modified by two Notes. ~~a~~ Note 1 specifies~~indicating that~~ separate Condition entry is allowed for each valve. Note 2 specifies LCO 3.0.4 does not apply. PA3.7-121

~~A.1 and A.2~~

~~With one MFIV in one or more flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close or isolate inoperable affected valves within [72] hours. When these valves are closed or isolated, they are performing their required safety function.~~ PA3.7-118

(continued)

PA3.7-201 CL3.7-227

BASES

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

~~The [72] hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valves and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The [72] hour Completion Time is reasonable, based on operating experience.~~ PA3.7-118

~~Inoperable MFIVs that are closed or isolated must be verified on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of valve status indications available in the control room, and other administrative controls, to ensure that these valves are closed or isolated.~~

~~B.1 and B.2~~A.1 and A.2

With one MFRV in one or both~~more~~ flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close and place in manual or to isolate flow through inoperable affected valves within [72] hours. When these valves are closed or isolated, they are performing their required safety function. Similarly, if the feedwater flow path to containment is isolated using, as an example, the MFIV, the required safety function is being met. PA3.7-237

The [72] hour Completion Time takes into account the redundancy afforded by the remaining ~~OPERABLE~~ valves in the feedwater line and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The [72] hour Completion Time is reasonable, based on operating experience.

(continued)

PA3.7-201 CL3.7-227

BASES

Inoperable MFRVs, that are closed and in manual or isolated, must be verified on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of valve status indications available in the control room, and other administrative controls to ensure that the valves are closed or isolated. PA3.7-237

ACTIONS ~~(continued)~~

~~C.1 and C.2~~B.1 and B.2

With one ~~associated~~MFRV bypass valve in one or both~~more~~ flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close and place in manual or to isolate flow through inoperable affected valves within [72] hours. When these valves are closed or isolated, they are performing their required safety function. Similarly, if the feedwater flow path to containment is isolated using, as an example, the MFIV, the required safety function is being met. PA3.7-237

The [72] hour Completion Time takes into account the redundancy afforded by the remaining ~~OPERABLE~~ valves in the feedwater line and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The [72] hour Completion Time is reasonable, based on operating experience.

Inoperable ~~associated~~MFRV bypass valves that are closed and placed in manual or isolated must be verified on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering PA3.7-237

(continued)

PA3.7-201 CL3.7-227

BASES

judgment, in view of valve status indications available in the control room, and other administrative controls, to ensure that these valves are closed or isolated.

~~D.1~~

~~With two inoperable valves in the same flow path, there may be no redundant system to operate automatically and perform the required safety function. Although the containment can be isolated with the failure of two valves in parallel in the same flow path, the double failure can be an indication of a common mode failure in the valves of this flow path, and as such, is treated the same as a loss of the isolation capability of this flow path. Under these conditions, affected valves in each flow path must be restored to OPERABLE status, or the affected flow path isolated within 8 hours. This action returns the system to the condition where at least one valve in each flow path is performing the required safety function. The 8 hour Completion Time is reasonable, based on operating experience, to complete the actions required to close the MFIV or MFRV, or otherwise isolate the affected flow path.~~ CL3.7-123

ACTIONS (continued)

~~C~~E.1 and ~~C~~E.2

If the ~~MFIV(s) and~~ MFRV(s) ~~and~~or the ~~associated~~MFRV bypass valve(s) cannot be restored to OPERABLE status, ~~or~~ closed, ~~or~~ isolated, or the flow path through the valve isolated within the associated Completion Time, 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 4 within 12 hours]. The allowed Completion Times are reasonable, based on operating PA3.7-237

(continued)

PA3.7-201 CL3.7-227

BASES

experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1

This SR verifies that the closure time of each ~~MFIV,~~ MFRV~~,~~ and ~~associated~~MFRV bypass valve~~s~~ is within limits set by the Inservice Testing Program~~≤ 7 seconds on an actual or simulated actuation signal~~. The ~~MFIV and~~ MFRV isolation ~~closure~~ times are assumed in the accident and containment analyses. This Surveillance is normally performed upon returning the unit to operation following a refueling outage. ~~These valves should not be tested at power since even a part stroke exercise increases the risk of a valve closure with the unit generating power.~~ This is consistent with the ASME Code~~,~~ ~~Section XI~~ (Ref. 2)~~,~~ ~~quarterly~~periodic stroke requirements during operation in MODES 1 and 2.

PA3.7-118 PA3.7-120 TA3.7-117 PA3.7-241

The Frequency for this SR is in accordance with the [Inservice Testing Program ~~or [18] months~~].

~~The [18] month Frequency for valve closure is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency~~.

TA3.7-117

SURVEILLANCE REQUIREMENTS

SR 3.7.3.2

This SR verifies that each MFRV and MFRV bypass valve can close on an actual or simulated FWI signal. This Surveillance is normally performed upon returning the plant to operation

TA3.7-117

PA3.7-201 CL3.7-227

BASES

following a refueling outage.

The Frequency for this SR is every 24 months. The 24 month Frequency for testing is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed. Therefore, this Frequency is acceptable from a reliability standpoint. TA3.7-117

REFERENCES

1. UFSAR, Section 11.9[~~10.4.7~~].
2. ASME, Boiler and Pressure Vessel Code, Section XI.

B 3.7 PLANT SYSTEMS

B 3.7.4 Steam Generator (SG) Power Operated Relief Valves (PORVs)~~Atmospheric Dump Valves (ADVs)~~

BASES

CL3.7-124

BACKGROUND

The SG PORVs~~ADVs~~ provide a method for cooling the unit to residual heat removal (RHR) entry conditions should the preferred heat sink via the Steam Dump~~Bypass~~ System to the condenser ~~not~~be unavailable, as discussed in the UFSAR, ~~Section [10.3]~~ (Ref. 1). Cooldown~~This~~ is performed~~done~~ in conjunction with the Auxiliary Feedwater System providing makeup water to the steam generators~~cooling water from the condensate storage tank (CST)~~. ~~The ADVs may also be required to meet the design cooldown rate during a normal cooldown when steam pressure drops too low for maintenance of a vacuum in the condenser to permit use of the Steam Dump System.~~ CL3.7-242

One SG PORV~~ADV line~~ is provided for each ~~of the [four]~~ steam generators~~ is provided~~. Each SG PORV~~ADV~~ line consists of one SG PORV~~ADV~~ and an associated block valve. CL3.7-242

The ~~ADVs are provided with~~ upstream manual block valves ~~to~~ permit ~~their being tested~~ SG PORV testing at power~~,~~ and ~~to~~ provide an alternate means of isolation. The SG PORVs~~ADVs~~ are equipped with pneumatic controllers to permit control of the cooldown rate. CL3.7-242

~~The ADVs are usually provided with a pressurized gas suppl of bottled nitrogen that, on a loss of pressure in the normal instrument air supply, automatically supplies nitrogen to operate the ADVs. The nitrogen supply is sized to provide the sufficient pressurized gas to~~ CL3.7-242

BASES

A description of the SG PORVs~~ADVs~~ is found in References 1 ~~and operate the ADVs for the time required for Reactor Coolant System cooldown to RHR entry conditions.~~ 2. ~~The ADVs are OPERABLE with only a DC power source available. In addition, handwheels are provided for local manual operation.~~

APPLICABLE SAFETY ANALYSES

~~The design basis of the ADVs is established by the capability to cool the unit to RHR entry conditions. The design rate of [75]°F per hour is applicable for two steam generators, each with one ADV. This rate is adequate to cool the unit to RHR entry conditions with only one steam generator and one ADV, utilizing the cooling water supply available in the CST.~~ CL3.7-243

Automatic operation of the SG PORVs is not credited in the safety analyses. Rather, the SG PORVs may provide mitigation for accidents involving use of main steam safety valves. CL3.7-243

In the steam generator tube rupture (SGTR) accident analysis presented in Reference ~~1~~2, the SG PORV~~ADVs~~ in the unaffected steam generator is~~are~~ assumed to be used by the operator to cool down the unit ~~to RHR entry conditions~~ for accidents accompanied by a loss of offsite power. Prior to operator actions to cool down the unit, the ~~ADVs and~~ main steam safety valves (MSSVs) are assumed to operate automatically to relieve steam and maintain the steam generator pressure below the design value. For the recovery from a ~~steam generator tube rupture (SGTR)~~ event, the operator is ~~also~~ required to perform a limited cooldown to establish adequate subcooling as a necessary step prior to terminate~~ing~~ the primary to secondary break flow into the ruptured steam generator. The time required to terminate the primary to secondary break flow for a~~n~~ SGTR is more critical than the time required to cool down ~~to RHR conditions~~ CL3.7-243

BASES

–for this event and also for other accidents. ~~Thus, the SGTR is the limiting event for the ADVs. The number of ADVs required to be OPERABLE to satisfy the SGTR accident analysis requirements depends upon the number of unit loops and consideration of any single failure assumptions regarding the failure of one ADV to open on demand.~~

The SG PORVs~~ADVs~~ are equipped with manual block valves in the event an SG PORV~~ADV~~ spuriously fails ~~to~~ open or fails to close during use.

The SG PORVs~~ADVs~~ satisfy Criterion 3 of 10 CFR 50.36 (c)(2)(ii)~~the NRC Policy Statement~~.

LCO

Two~~[Three]~~ SG PORVs~~ADV lines~~ are required to be OPERABLE~~. One ADV line is required from each of [three] steam generators~~ to ensure that at least one SG PORV~~ADV line~~ is available to conduct a unit cooldown following an SGTR~~, in which one steam generator becomes unavailable, accompanied by a single, active failure of a second ADV line on an unaffected steam generator. The block valves must be OPERABLE to isolate a failed open ADV line. A closed block valve does not render it or its ADV line inoperable if operator action time to open the block valve is supported in the accident analysis~~. CL3.7-244

Failure to meet the LCO can result in the inability to cool the unit to RHR entry conditions following an event in which

BASES

LCO (continued)

the condenser is unavailable for use with the Steam Dump~~Bypass~~ System.

An SG PORV~~ADV~~ is considered OPERABLE when it is capable of ~~providing controlled relief of the main steam flow and capable of fully opening and closing on demand.~~being remotely operated and when its associated block valve is open. CL3.7-244

APPLICABILITY

In MODES 1, 2, and 3~~, and in MODE 4, when a steam generator is being relied upon for heat removal~~, the SG PORVs~~ADVs~~ are required to be OPERABLE. CL3.7-125

In MODE 4, a steam generator and the SG PORV are not relied upon for heat removal.

In MODE 5 or 6, a~~n~~ SGTR is not a credible event.

ACTIONS

A.1

With one required SG PORV~~ADV line~~ inoperable, action must be taken to restore OPERABLE status within 7 days.

The 7 day Completion Time allows for the redundant capability afforded by the remaining OPERABLE SG PORV~~ADV lines~~, ~~a nonsafety grade backup in the~~ Steam Dump~~Bypass~~ System, and MSSVs.

Required Action A.1 is modified by a Note indicating that LCO 3.0.4 does not apply.

B.1

With two ~~or more~~ SG PORVs~~ADV lines~~ inoperable, action must be taken to restore~~all but~~ one SG PORV~~ADV line~~ to OPERABLE status. Since the block valve can be closed to isolate a~~n~~ SG PORV~~ADV~~, some repairs may be possible with the unit at power.

The 24 hour Completion Time is reasonable to repair an inoperable SG PORV~~ADV lines~~, based on the availability of the Steam Dump~~Bypass~~ System and MSSVs, and the low probability of an event occurring during this period that would require the SG PORV~~ADV lines~~.

BASES

C.1 and C.2

If the SG PORV~~ADV lines~~ cannot be restored to OPERABLE status within the associated Completion Time, 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

CL3.7-125

~~ACTIONS~~ ~~C.1 and C.2 (continued)~~
MODE 3 within 6 hours, and in MODE 4~~, without reliance upon steam generator for heat removal,~~ within 12~~[18]~~ 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.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.4.1

~~To perform a controlled cooldown of the RCS, the ADVs must be able to be opened either remotely or locally and throttled through their full range.~~ This SR ensures that the SG PORVs~~ADVs~~ are tested through a full control cycle in accordance with the Inservice Testing Program~~at least once per fuel cycle~~. The SG PORV is isolated by the block valve for this test. Performance of inservice testing or use of a~~n~~ SG PORV~~ADV~~ during a unit cooldown may satisfy this requirement.

X3.7-130

Operating experience has shown that these components usually pass the Surveillance when performed~~at the [18] month Frequency~~ in accordance with the Inservice Testing Program. The Frequency is acceptable from a reliability standpoint.

X3.7-130

~~Sr 3.7.4.2~~

~~The function of the block valve is to isolate a failed open ADV. Cycling the block valve both closed and open demonstrates its capability to perform this function. Performance of inservice testing or use of the block valve during unit cooldown may satisfy this requirement.~~ CL3.7-126

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

REFERENCES

1. UFSAR, Section 11.4~~[10.3]~~.
2. USAR, Section 14.

B 3.7 PLANT SYSTEMS

B 3.7.5 Auxiliary Feedwater (AFW) System

PA3.7-201

BASES

BACKGROUND

The AFW System automatically supplies feedwater to the steam generators to remove decay heat from the Reactor Coolant System upon the loss of normal feedwater supply.

The AFW system is configured into two redundant trains. One train has a turbine driven AFW pump; the other has a motor driven AFW pump. Each AFW pump feeds the designated unit's two steam generators. In addition, each motor driven pump has the capability to be realigned locally to feed the other unit's steam generators.

CL3.7-246

The AFW pumps take suction ~~through separate and independent suction lines~~ from:

a. ~~t~~the nonsafety-related condensate storage tank (CST) supply header (LCO 3.7.6); or

CL3.7-246

b. The safety-related Cooling Water System (LCO 3.7.8).

CL3.7-246

The AFW~~and~~ pumps supply water to the steam generator secondary side via ~~separate and independent~~ connections to the main feedwater (MFW) piping adjacent to the steam generators in~~out~~side containment.

The steam generators function as a heat sink for core decay heat. The heat load may be~~is~~ dissipated by releasing steam to the atmosphere from the steam generators via the main steam safety valves (MSSVs) (LCO 3.7.1); ~~or~~ steam generator power operated relief ~~atmospheric dump~~ valves (SG PORVs) (LCO 3.7.4), or steam dump valve.

PA3.7-247

If the main condenser is available, steam may be released via the steam ~~bypass~~dump valves~~ and recirculated to the CST~~. ~~The~~Each unit's AFW System consists of:

a. One ~~[two]~~ motor driven AFW pumps~~; and~~
b. ~~O~~one ~~steam~~ turbine driven AFW pump;
c. Steam generator AFW motor-operated supply valves; and
d. Steam generator AFW motor-operated throttle valves.

CL3.7-246

PA3.7-201

BASES

These components are configured ~~into~~ provide a flow path from each pump to both steam generators for the specific unit. ~~[three]trains.~~

Each motor driven or turbine driven AFW pump can provides ~~[~~100~~]~~% of the required AFW flow capacity~~, and the turbine driven pump provides [200]% of the required capacity~~ to the steam generators, as assumed in the accident analysis. The pumps are equipped with independent recirculation lines to prevent pump operation against a closed system.

~~Each motor-driven AFW pump is powered from an independent Class 1E power supply and feeds [two] steam generators, although each pump has the capability to be realigned from the control room to feed other steam generators.~~

The ~~steam~~ turbine driven AFW pump receives steam from both~~two~~ main steam lines upstream of the main steam isolation valves. Each ~~of the~~ steam feed line~~s~~ will supply 100% of the requirements of the turbine driven AFW pump. An air operated valve downstream of the motor operated valves from each loop allows passage of steam to the turbine driven AFW pump when required. The air supply to the valve is controlled by a normally open DC solenoid valve designed such that failure of either the air supply or control power would cause the respective valve to open, starting the turbine driven AFW pump.

CL3.7-246

PA3.7-201

BASES

The AFW System is capable of supplying feedwater to the steam generators during normal unit operation in MODES 2 and ~~3 startup, shutdown, and hot standby conditions~~. ~~The turbine driven AFW pump supplies a common header capable of feeding all steam generators with DC powered control valves actuated to the appropriate steam generator by the Engineered Safety Feature Actuation System (ESFAS).~~ One pump at full flow is sufficient to remove decay heat and cool the unit to residual heat removal (RHR) entry conditions. ~~Thus, the requirement for diversity in motive power sources for the AFW System is met.~~

The AFW System is designed to supply sufficient water to the steam generator~~(s)~~ to remove decay heat with steam generator pressure at the setpoint of the MSSVs. Subsequently, the AFW System supplies sufficient water to cool the unit to RHR entry conditions, with steam released through the SG PORV~~ADV~~s or steam dump valve.

The following safety signals automatically initiate an AFW pump start signal:

CL3.7-248

a. Low-low water level in either steam generator; and

b. Safety injection.

Additionally, the following signals initiate an AFW pump start signal:

a. Trip of both main feedwater pumps (bypassed during startup and shutdown operation);

b. Loss of both 4 kV normal buses (turbine driven AFW pump only); and

c. Manually either local or remote.

PA3.7-201

BASES

Depending on pump type, the motor will start or the turbine steam admission air operated control valve will open.

~~The AFW System actuates automatically on steam generator water level—low-low by the ESFAS (LCO 3.3.2). The system also actuates on loss of offsite power, safety injection, and trip of all MFW pumps.~~

The AFW System is discussed in the UFSAR~~,~~ ~~Section [10.4.9]~~ (Ref. 1).

APPLICABLE SAFETY ANALYSES

The AFW System mitigates the consequences of any event ~~with~~involving loss of normal feedwater.

The design basis of the AFW System is to supply water to the steam generator to remove decay heat and other residual heat by delivering at least the minimum required flow rate to the steam generators at pressures corresponding to the lowest steam generator safety valve set pressure plus ~~3%~~ margin for uncertainty and accumulation.

~~In addition, the AFW System must supply enough makeup water to replace steam generator secondary inventory lost as the unit cools to MODE 4 conditions. Sufficient AFW flow must also be available to account for flow losses such as pump recirculation and line breaks.~~

CL3.7-251

The limiting plant condition which imposes safety-related performance requirements on the design of ~~Design Basis Accidents (DBAs) and transients for~~ the AFW System is the~~are as follows:~~

~~a. Feedwater Line Break (FWLB); and~~
~~b.~~ ~~L~~loss of MFW~~.~~

PA3.7-201

BASES

as described in References 1 and 3.
~~In addition, the minimum available AFW flow and system characteristics are serious considerations in the analysis of a small break loss of coolant accident (LOCA).~~

~~The AFW System design is such that it can perform its function following an FWLB between the MFW isolation valves and containment, combined with a loss of offsite power following turbine trip, and a single active failure of the steam turbine driven AFW pump. In such a case, the ESFAS logic may not detect the affected steam generator if the backflow check valve to the affected MFW header worked properly. One motor driven AFW pump would deliver to the broken MFW header at the pump runout flow until the problem was detected, and flow terminated by the operator. Sufficient flow would be delivered to the intact steam generator by the redundant AFW pump.~~

CL3.7-251

The low-low steam generator level signal ~~ESFAS~~ automatically actuates the motor and turbine driven AFW ~~turbine driven~~ pumps and associated air~~power~~ operated valves and controls when required to ensure an adequate feedwater supply to the steam generators during loss of offsite power. ~~DC power~~ Normally open motor operated valves are provided for each AFW line to allow throttling of ~~control~~ the AFW flow from each AFW pump to each steam generator when required.

CL3.7-251

The AFW System satisfies the requirements of Criterion 3 of 10 CFR 50.36(c)(2)(ii) ~~the NRC Policy Statement~~.

LCO

This LCO provides assurance that the AFW System will perform its design safety function to mitigate the consequences of accidents that could result in overpressurization of the reactor coolant pressure boundary.

PA3.7-201

BASES

[two~~[Three]~~ independent AFW pumps in [two~~[three]~~ diverse trains are required to be OPERABLE to ensure the availability of decay heat removal~~RHR~~ capability for all events accompanied by a loss of ~~offsite power~~ main feedwater and a single failure.

CL3.7-251

~~This is accomplished by powering two of the pumps from independent emergency buses.~~

~~The third AFW pump is powered by a different means, a steam driven turbine, supplied with steam from a source that is not isolated by closure of the MSIVs.~~

~~The AFW System is configured into [three] trains.~~

The AFW System is considered OPERABLE when the components and flow paths required to provide redundant AFW flow to the steam generators are OPERABLE. This requires that ~~the~~ one~~two~~ motor driven AFW pump~~s~~ be OPERABLE and capable of ~~in [two] diverse paths, each~~ supplying AFW to both ~~separate~~ steam generators. The turbine driven AFW pump is required to be OPERABLE with redundant steam supplies from each of ~~[two]~~ main steam lines upstream of the MSIVs, and shall be capable of supplying AFW to both~~any of the~~ steam generators. The piping, valves, instrumentation, and controls in the required flow paths, required for the system to perform the safety related function, also are required to be OPERABLE. The normal (Condensate Storage Tanks (CSTs)) and backup (Cooling Water System) water supplies to the AFW pumps must also be OPERABLE. OPERABILITY requirements for the CSTs are specified in LCO 3.7.6, "Condensate Storage Tanks (CSTs)."

CL3.7-251

PA3.7-255

The LCO is modified by a Note indicating that ~~one~~an AFW train~~, which includes a motor driven pump, is required to~~ may be considered OPERABLE

CL3.7-128

PA3.7-201

BASES

~~in MODE 4~~ during alignment and operation for steam generator level control if capable of being manually realigned to the AFW mode of operation. ~~This is because of the reduced heat removal requirements and short period of time in MODE 4 during which the AFW is required and the insufficient steam available in MODE 4 to power the turbine driven AFW pump.~~

During operation in MODES 2 and 3, the AFW pump discharge motor operated valves used for throttling may be less than full open. The Shutdown-Auto mode of control may be used during such operations. This control mode bypasses the AFW pump start due to both MFW pumps being tripped or shutdown.

CL3.7-128

APPLICABILITY

In MODES 1, 2, and 3, the AFW System is required to be OPERABLE in the event that it is called upon to provide heat removal ~~function~~ ~~when the MFW is lost~~. In addition, the AFW System is required to supply enough makeup water to replace the steam generator secondary inventory, lost as the unit cools to MODE 4 conditions.

PA3.7-253

~~In MODE 4 the AFW System may be used for heat removal via the steam generators.~~

CL3.7-129

In MODES 4, 5 or 6, ~~the steam generators are not normally used for heat removal, and~~ the AFW System is not required to perform a safety function.

ACTIONS

A.1

If one of the two steam supplies to the turbine driven AFW train is inoperable, or if a turbine driven pump is inoperable while in MODE 3 immediately following refueling, action must be taken to restore the inoperable equipment to an OPERABLE status within 7 days. The 7 day Completion Time is reasonable, based on the following reasons:

TA3.7-150

PA3.7-201

BASES

a. For the inoperability of a steam supply to the turbine driven AFW pump, t~~T~~he 7 day Completion Time is reasonable since there is a redundant ~~OPERABLE~~ steam supply line for ~~to~~ the turbine driven ~~AFW~~ pump; TA3.7-150

b. For the inoperability of a turbine driven AFW pump while in MODE 3 immediately subsequent to a refueling outage, the 7 day Completion Time is reasonable due to the minimal decay heat levels in this situation~~The availability of redundant OPERABLE motor driven AFW pumps~~; and TA3.7-150

c. For both the inoperability of a steam supply line to the turbine driven pump and an inoperable turbine driven AFW pump while in MODE 3 immediately following a refueling outage, the 7 day Completion Time is reasonable due to the availability of the redundant OPERABLE motor driven AFW pump, and due to t~~T~~he low probability of an event ~~occurring that~~ requiring~~es~~ the use of~~inoperable steam supply to~~ the turbine driven AFW pump. TA3.7-150

Condition A is modified by a Note which limits the applicability of the Condition when the unit has not entered MODE 2 following a refueling. Condition A allows one AFW train to be inoperable for 7 days vice the 72 hour Completion Time in Condition B. This longer Completion Time is based on the reduced decay heat following refueling and prior to the reactor being critical. TA3.7-150

ACTIONS

~~A.1 (continued)~~

~~The second Completion Time for Required Action A.1 establishes a limit on the maximum time allowed for~~ CL3.7-131

PA3.7-201

BASES

~~any combination of Conditions to be inoperable during any continuous failure to meet this LCO.~~

~~The 10 day Completion Time provides a limitation time allowed in this specified Condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The AND connector between 7 days and 10 days dictates that both Completion Times apply simultaneously, and the more restrictive must be met.~~

B.1

With one of the required AFW trains (pump or flow path) inoperable ~~in MODE 1, 2, or 3 [~~for reasons other than Condition A~~]~~, action must be taken to restore OPERABLE status within 72 hours. This Condition includes the loss of two steam supply lines to the turbine driven AFW pump. The 72 hour Completion Time is reasonable, based on redundant capabilities afforded by the AFW System, time needed for repairs, and the low probability of a DBA occurring during this time period.

CL3.7-129

~~The second Completion Time for Required Action B.1 establishes a limit on the maximum time allowed for any combination of Conditions to be inoperable during any continuous failure to meet this LCO.~~

CL3.7-131

~~The 10 day Completion Time provides a limitation time allowed in this specified Condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The AND connector between 72 hours and 10 days dictates that both Completion Times apply simultaneously, and the more restrictive must be met.~~

PA3.7-201

BASES

C.1 and C.2

When Required Action A.1 ~~[~~or B.1~~]~~ cannot be completed within the required Completion Time, ~~or if two AFW trains are~~ CL3.7-133

ACTIONS ~~C.1 and C.2 (continued)~~

~~inoperable in MODE 1, 2, or 3,~~ 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 4 within 12 ~~[18]~~ hours. CL3.7-132

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

~~In MODE 4 with two AFW trains inoperable, operation is allowed to continue because only one motor driven pump AFW train is required in accordance with the Note that modifies the LCO. Although not required, the unit may continue to cool down and initiate RHR.~~ CL3.7-133

D.1

If both ~~all [three]~~ AFW trains are inoperable ~~in MODE 1, 2, or 3~~, the unit is in a seriously degraded condition with no safety related means for conducting a cooldown, and only limited means for conducting a cooldown with nonsafety related equipment. In such a condition, the unit should not be perturbed by any action, including a power change, that might result in a trip. The seriousness of this condition requires that action be started immediately to restore one AFW train to OPERABLE status. CL3.7-133

BASES (continued)

Required Action D.1 is modified by a Note indicating that all required MODE changes or power reductions are suspended until one AFW train is restored to OPERABLE status. In this case, LCO 3.0.3 is not applicable because it could force the unit into a less safe condition.

~~E.1~~

~~In MODE 4, either the reactor coolant pumps or the RHR loops can be used to provide forced circulation. This is addressed in LCO 3.4.6, "RCS Loops-MODE 4." With one required AFW train inoperable, action must be taken to immediately restore the inoperable train to OPERABLE status. The immediate Completion Time is consistent with LCO 3.4.6.~~

CL3.7-129

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

This SR verifies~~Verifying~~ the correct alignment for manual, power operated, and automatic valves in the AFW System water and steam supply flow paths thereby providing~~es~~ assurance that the proper flow paths will exist for AFW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves.

This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

BASES (continued)

This SR is modified by a Note that states one or more AFW trains may be considered OPERABLE during alignment and operation for steam generator level control, if it is capable of being manually (i.e., remotely or locally, as appropriate) realigned to the AFW mode of operation, provided it is not otherwise inoperable. This exception allows the system to be out of its normal standby alignment and temporarily incapable of automatic initiation without declaring the train(s) inoperable. Since AFW may be used during MODE 2, 3 and 4 operations for steam generator level control, and these manual operations are an accepted function of the AFW system, OPERABILITY (i.e., the intended safety function) continues to be maintained. TA3.7-136

SR 3.7.5.2

Verifying that each AFW pump's developed head at the flow test point is greater than or equal to the required developed head ensures that AFW pump performance has not degraded during the cycle. ~~Flow and~~ Differential pressure~~head are~~ is a normal test~~s~~ of centrifugal~~centrigufal~~ pump performance required by Section XI of the ASME Code (Ref. 2). Because it is undesirable to introduce cold AFW into the steam generators while they are operating, this testing is performed on recirculation flow. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. Performance of inservice testing discussed in the ASME Code, Section XI (Ref. 2)~~ (only required at 3 month intervals)~~ satisfies this requirement. The Inservice Testing Program specifies the ~~[31] day~~ Frequency ~~on a STAGGERED TEST BASIS results in~~ for testing each pump~~ once every 3 months, as required by Reference 2~~. This test is considered satisfactory if control board indication and subsequent visual observation of the equipment demonstrate that all components have operated properly. TA3.7-135 CL3.7-258 PA3.7-255

BASES (continued)

This SR is modified by a Note indicating that the SR should be deferred until suitable test conditions are established. This deferral is required because there is insufficient steam pressure to perform the test. This deferral is based on the inservice testing requirements not met; all other requirements for OPERABILITY must be satisfied. PA3.7-255

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.5.3

This SR verifies that AFW can be delivered to the appropriate steam generator ~~in the event of any accident or transient that generates an ESFAS,~~ by demonstrating that each automatic valve in the flow path actuates to its correct position on an actual or simulated safety injection ~~actuation~~ signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. This test is considered satisfactory if control board indication and subsequent visual observation of the equipment demonstrate that all components have operated properly. PA3.7-255 The 24 ~~[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. The 24 ~~[18]~~ month Frequency is acceptable based on operating experience and the design reliability of the equipment. X3.7-137

This SR is modified by a Note that states one or more AFW trains may be considered OPERABLE during alignment and operation for steam generator level TA3.7-136 CL3.7-138

BASES (continued)

control, if it is capable of being manually (i.e., remotely or locally, as appropriate) realigned to the AFW mode of operation, provided it is not otherwise inoperable. This exception allows the system to be out of its normal standby alignment and temporarily incapable of automatic initiation without declaring the train(s) inoperable. Since AFW may be used during MODES 2, 3 and 4 operations for steam generator level control, and these manual operations are an accepted function of the AFW system, OPERABILITY (i.e., the intended safety function) continues to be maintained~~the SR is not required in MODE 4. In MODE 4, the required AFW train is already aligned and operating~~.

SR 3.7.5.4

This SR verifies that the AFW pumps will start ~~in the event of any accident or transient that generates an ESFAS~~when required by demonstrating that each AFW pump starts automatically on an actual or simulated AFW pump start ~~actuation~~ signal~~in MODES 1, 2, and 3. In MODE 4, the required pump is already operating and the autostart function is not required~~. Since this test is performed during unit shutdown, the turbine driven AFW pump is not actually started, but the components necessary to assure it starts on an actual or simulated AFW pump start signal are demonstrated to be OPERABLE. This test is considered satisfactory if control board indication and subsequent visual observation of the equipment demonstrate that all components have operated properly. The 24 ~~[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.

PA3.7-255

X3.7-137

TA3.7-136

This SR is modified by ~~[a] [two]~~ Note~~[s]. [Note~~

PA3.7-201

BASES

~~1 indicates~~ that ~~the SR be deferred until suitable test conditions are established. This deferral is required because there is insufficient steam pressure to perform the test.] [The] Note [2]~~ states ~~that~~ one or more AFW trains may be considered OPERABLE during alignment and operation for steam generator level control, if it is capable of being manually (i.e., remotely or locally, as appropriate) realigned to the AFW mode of operation, provided it is not otherwise inoperable. This exception allows the system to be out of its normal standby alignment and temporarily incapable of automatic initiation without declaring the train(s) inoperable. Since AFW may be used during MODES 2, 3 and 4 operations for steam generator level control, and these manual operations are an accepted function of the AFW system, OPERABILITY (i.e., the intended safety function) continues to be maintained~~the SR is not required in MODE 4. [In MODE 4, the required pump is already operating and the autostart function is not required.] [In MODE 4, the heat removal requirements would be less providing more time for operator action to manually start the required AFW pump.]~~

CL3.7-138

SURVEILLANCE REQUIREMENTS

SR 3.7.5.4 (continued)

~~Reviewer's Note: Some plants may not routinely use the AFW for heat removal in MODE 4. The second justification is provided for plants that use a startup feedwater pump rather than AFW for startup and shutdown.~~

~~SR 3.7.5.5~~

~~This SR verifies that the AFW is properly aligned by verifying the flow paths from the CST to each steam generator prior to entering MODE 2 after more than 30 days in MODE 5 or 6. OPERABILITY of AFW flow paths must be verified before sufficient core heat is generated that would require the operation of the~~

PA3.7-139

PA3.7-201

BASES

~~AFW System during a subsequent shutdown. The Frequency is reasonable, based on engineering judgement and other administrative controls that ensure that flow paths remain OPERABLE. To further ensure AFW System alignment, flow path OPERABILITY is verified following extended outages to determine no misalignment of valves has occurred. This SR ensures that the flow path from the CST to the steam generators is properly aligned. (This SR is not required by those units that use AFW for normal startup and shutdown.)~~

REFERENCES

1. UFSAR, Section 11.9~~[10.4.9]~~.
2. ASME, Boiler and Pressure Vessel Code, Section XI.
3. USAR, Section 14.4.

B 3.7 PLANT SYSTEMS

B 3.7.6 Condensate Storage Tanks (CSTs)

PA3.7-201

CL3.7-141

BASES

BACKGROUND

Three 150,000 gallon CSTs are shared via a common header between the 2 units. Unit 1 has 1 tank (11) and Unit 2 has 2 tanks (21 and 22). The CSTs provide~~s~~ a nonsafety grade source of water to the steam generators for removing decay and sensible heat from the Reactor Coolant System (RCS). CL3.7-254

A backup safety grade source of water is provided by the safety-related portion of the Cooling Water (CL) System (LCO 3.7.8) via either the Emergency Cooling Water Line or the emergency bay sluice gates.

Since water supplied from the CL System is of lower purity, its use is considered less desirable under normal conditions than the higher purity condensate water from the CSTs. However, if needed, the operator can lineup the Cooling Water supply by opening the associated CL supply motor operated valve (MOV) and closing the associated CST supply MOV for each auxiliary feedwater pump. CL3.7-254

The CSTs provide~~s~~ a passive flow of water, by gravity, to the Auxiliary Feedwater (AFW) System (LCO 3.7.5). The steam produced is released to the atmosphere by the main steam safety valves, ~~or~~ the steam generator power operated relief valves or the atmospheric dump valve~~s~~. Each~~The~~ AFW pump~~s~~ operates with a continuous recirculation to a~~the~~ CST. PA3.7-247

When the main steam isolation valves are open, the preferred means of heat removal is to discharge steam to the condenser by the nonsafety grade path of the steam dump~~bypass~~ valve~~s~~. The condensed steam ~~is~~may be returned to the CSTs by the

(continued)

PA3.7-201

CL3.7-141

BASES

condensate ~~transfer~~ pump. This has the advantage of conserving condensate while minimizing releases to the environment.

Although~~Because~~ the CSTs are ~~is~~ a principal secondary side water source ~~component~~ for~~in~~ removing residual heat from the RCS, they are not~~it is~~ designed to withstand earthquakes and other natural phenomena, including missiles that might be generated by natural phenomena. However, the backup CL safety-related source is designed to withstand such phenomena. ~~The CST is designed to Seismic Category I to ensure availability of the feedwater supply. Feedwater is also available from alternate sources.~~ CL3.7-254

A description of the CSTs is found in the UFSAR, ~~Section [9.2.6]~~ (Ref. 1).

APPLICABLE SAFETY ANALYSES

The CSTs may provide~~s~~ high purity cooling water to remove decay heat and to cool down the unit following ~~all~~ events in the accident analysis as discussed in the UFSAR, ~~Chapters [6] and [15]~~ (Refs. 2~~and 3, respectively~~). ~~For anticipated operational occurrences and accidents that do not affect the OPERABILITY of the steam generators, the analysis assumption is generally 30 minutes at MODE 3, steaming through the MSSVs, followed by a cooldown to residual heat removal (RHR) entry conditions at the design cooldown rate. The limiting event for the condensate volume is the large feedwater line break coincident with a loss of offsite power.~~ CL3.7-256

~~Single failures that also affect this event include the following:~~ CL3.7-256

~~a. Failure of the diesel generator powering the motor driven AFW pump to the unaffected steam generator~~

(continued)

PA3.7-201

CL3.7-141

BASES

~~(requiring additional steam to drive the remaining AFW pump turbine); and~~

~~b. Failure of the steam driven AFW pump (requiring a longer time for cooldown using only one motor driven AFW pump).~~

~~These are not usually the limiting failures in terms of consequences for these events.~~

~~A nonlimiting event considered in CST inventory determinations is a break in either the main feedwater or AFW line near where the two join. This break has the potential for dumping condensate until terminated by operator action, since the Emergency Feedwater Actuation System would not detect a difference in pressure between the steam generators for this break location. This loss of condensate inventory is partially compensated for by the retention of steam generator inventory.~~

The 100,000 gallon CSTs volume requirement for each unit in MODE 1, 2, or 3 is sufficient to: CL3.7-256

a. Remove the decay heat generated by one reactor in the first 24 hours after shutdown; and

b. Ensure sufficient water is available to cool down a reactor from 547°F to 350°F using natural circulation at 25°F/hour.

These calculations take into account the decay heat and reactor coolant system stored energy. (Ref. 2)

The CST satisfies Criteria~~on~~ 2 and 3 of 10 CFR 50.36 (c)(2)(ii)~~the NRC Policy Statement~~. TA3.7-142

(continued)

PA3.7-201

CL3.7-141

BASES

LCO

~~To satisfy accident analysis assumptions, the CST must contain sufficient cooling water to remove decay heat for [30 minutes] following a reactor trip from 102% RTP, and then to cool down the RCS to RHR entry conditions, assuming a coincident loss of offsite power and the most adverse single failure. In doing this, it must retain sufficient water to ensure adequate net positive suction head for the AFW pumps during cooldown, as well as account for any losses from the steam driven AFW pump turbine, or before isolating AFW to a broken line.~~

The CSTs are considered OPERABLE when the CSTs' contents have at least 100,000 gallons per operating unit (MODES 1, 2, or 3).

CL3.7-257

~~The CST level required is equivalent to a usable volume of ≥ [110,000 gallons], which is based on holding the unit in MODE 3 for [2] hours, followed by a cooldown to RHR entry conditions at [75]°F/hour.~~ This basis is established in Reference ~~2~~4 and exceeds the volume required by the accident analysis.

LCO (continued)

The OPERABILITY of the CSTs is determined by maintaining the tank level at or above the minimum required level.

APPLICABILITY

In MODES 1, 2, and 3~~, and in MODE 4, when steam generator is~~

CL3.7-143

(continued)

PA3.7-201

CL3.7-141

BASES

~~being relied upon for heat removal~~, the CSTs are ~~is~~ required to be OPERABLE.

In MODES 4, 5 or 6, the CSTs are ~~is~~ not required because the AFW System is not required.

ACTIONS

A NOTE preceding the ACTIONS Table specifies the Conditions and Required Actions are applicable to both units. The common CST header and the sharing of the backup safety-related portion of the CL supply between the two units provide the basis for this requirement. CL3.7-141

A.1 and A.2

If the CSTs are not OPERABLE (e.g., level is not within limits), the OPERABILITY of the backup safety-related portion of the CL supply should be verified by administrative means within 4 hours and once every 12 hours thereafter. OPERABILITY of the backup safety-related portion of the CL ~~feedwater~~ supply must include verification that the flow paths from the backup water supply to the AFW pumps are OPERABLE in accordance with LCO 3.7.8 ~~, and that the backup supply has the required volume of water available.~~ The CSTs must be restored to OPERABLE status within 7 days~~, because the backup supply may be performing this function in addition to its normal functions~~. TA3.7-142 PA3.7-261

The 4 hour Completion Time is reasonable, based on operating experience, to verify the OPERABILITY of the backup safety-related portion of the Cooling Wwater supply. Additionally, verifying the backup water supply every 12 hours is adequate to ensure the backup water supply continues to be available. The 7 day Completion Time is reasonable, based on an OPERABLE backup safety-related TA3.7-262

(continued)

BASES (continued)

portion of the CL~~water~~ supply being available, and the low probability of an event occurring during this time period requiring the CSTs.

B.1 and B.2

If the CSTs cannot be restored to OPERABLE status within the associated Completion Time, 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 4, without reliance on the steam generator for heat removal, within 12~~[18]~~ hours. CL3.7-144

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 3.7.6.1

This SR verifies that the CSTs contain~~s~~ the required volume of cooling water. ~~(The required CST volume may be single value or a function of RCS conditions.)~~

The 12 hour Frequency is based on operating experience and the need for operator awareness of unit evolutions that may affect the CST inventory between checks.

Also, the 12 hour Frequency is considered adequate in view of other indications in the control room, including alarms, to alert the operator to abnormal deviations in the CST level.

BASES (continued)

REFERENCES

1. UFSAR, Section 11.9[9.2.6].
2. UFSAR, SectionChapter 14.4[6].
3. ~~FSAR, Chapter[15].~~

B 3.7 PLANT SYSTEMS

PA3.7-201

B 3.7.7 Component Cooling Water (CCW) System

PA3.7-145

BASES

BACKGROUND

The CCW System 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, the CCW System also provides this function for various nonessential components, as well as the spent fuel storage pool. The CCW System serves as a barrier to the release of radioactive byproducts between potentially radioactive systems and the Cooling~~Service~~ Water System, and thus to the environment.

~~A typical~~Each unit's CCW System is arranged as two ~~independent, full capacity~~ parallel cooling loops, and has isol~~a~~table nonsafety related components. Each safety related train includes a full capacity pump, supply from a common unit-specific surge tank, heat exchanger, piping, valves, and instrumentation. CL3.7-263

The CC systems have the capability to be cross-connected between loops and between the two units at the CC pump suction and discharge. These design features are not used during normal operation but do allow added flexibility of pump and heat exchanger combinations during abnormal conditions. CL3.7-263

During operation the outlet CC temperature from the CC heat exchanger is normally maintained between 80°F and 105°F. During operation CC water is circulated through the shell side of the CC heat exchanger and then to the various system components at a maximum temperature of 120°F for 2 hours (Ref. 1).

(continued)

PA3.7-145 PA3.7-201

BASES

Each safety related train is powered from a separate bus. An ~~open~~ surge tank in the system ~~provides pump trip protective functions~~ is provided to ensure that sufficient net positive suction head is available. The pump in each train is automatically started on receipt of a safety injection signal, and all nonessential components are isolated. In addition, an automatic low pressure pump start can avert a reactor coolant pump seal failure during a loss of offsite power event (Ref. 1). CL3.7-264

Additional information on the design and operation of the system, along with a list of the components served, is presented in the UFSAR, ~~Section [9.2.2]~~ (Ref. 1).

The principal safety related function of the CCW System is the removal of decay heat from the reactor via the Residual Heat Removal (RHR) System~~. This may be~~ during ~~a normal or~~ post accident ~~cooldown and shutdown~~containment sump recirculation.

APPLICABLE SAFETY ANALYSES

The design basis of the CCW System is for one CCW train to remove the post loss of coolant accident (LOCA) heat load from the containment sump during the recirculation phase~~, with a maximum CCW temperature of [120]°F (Ref. 2)~~.

During an accident, a design CC inlet temperature to the major heat exchangers of 95°F was assumed. The RHR heat exchanger during DBA long-term conditions is the primary heat load. The required post accident heat removal rate is in the same range as the required rate during MODES 1 or 2, but less than that needed during normal MODE 4 condition. In a normal MODE 4 cooldown from 350°F to 200°F, more equipment is expected to be operating than during a post accident condition or cooldown. The time required to cool from 350°F to 200°F is a function of the number of CC and RHR trains operating (Ref. 1). CL3.7-266

(continued)

PA3.7-145 PA3.7-201

BASES

~~The Emergency Core Cooling System (ECCS) LOCA and containment OPERABILITY LOCA each model the maximum and minimum performance of the CCW System, respectively.~~

CL3.7-266

~~The normal temperature of the CCW is [80]°F, and, during unit cooldown to MODE 5 (T_{cold} < [200]°F), a maximum temperature of 95°F is assumed. This prevents the containment sump fluid from increasing in temperature during the recirculation phase following a LOCA, and provides a gradual reduction in the temperature of this fluid as it is supplied to the Reactor Coolant System (RCS) by the ECCS pumps.~~

The CCW System is designed to perform its function with a single failure of any active component, assuming a loss of offsite power. ~~The CCW System also functions to cool the unit from RHR entry conditions (T_{cold} < [350]°F), to MODE 5 (T_{cold} < [200]°F), during normal and post accident operations. The time required to cool from [350]°F to [200]°F is a function of the number of CCW and RHR trains operating.~~ One CCW train is sufficient to remove decay heat during subsequent operations ~~with T_{cold} < [200]°F~~. ~~This assumes a maximum service water temperature of [95]°F occurring simultaneously with the maximum heat loads on the system.~~

The CCW System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii) ~~the NRC Policy Statement~~.

LCO

The CCW trains are independent of each other to the degree that each has separate controls and power supplies and the operation of one does not depend on the other. In the event of a DBA, one CCW train is required to provide the minimum heat removal capability assumed in the safety analysis for the systems to which it supplies cooling water. To ensure this requirement is met, two trains of CCW must be OPERABLE. At least one CCW train will operate assuming the worst case single active failure occurs coincident with a loss of offsite power.

(continued)

PA3.7-145 PA3.7-201

BASES

A CCW train is considered OPERABLE when:

a. The pump ~~and associated surge tank are~~ IS OPERABLE; and CL3.7-267

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

The isolation of CCW from other components or systems ~~not required for safety~~ may render those components or systems inoperable but does not affect the OPERABILITY of the CCW System.

APPLICABILITY In MODES 1, 2, 3, and 4, the CCW System is a normally operating system, which must be prepared to perform its post accident safety functions, including but not limited to ~~primarily~~ RCS heat removal, which is achieved by cooling the RHR heat exchanger. PA3.7-271

In MODE 5 or 6, the OPERABILITY requirements of the CCW System are determined by the systems it supports.

ACTIONS A.1

Required Action A.1 is modified by a Note indicating that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops – MODE 4," be entered if an inoperable CCW train results in an inoperable RHR loop. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

If one CCW train is inoperable, action must be taken to restore OPERABLE status within 72 hours. In this Condition, the

(continued)

BASES (continued)

remaining OPERABLE CC~~W~~ train is adequate to perform the heat removal function. The 72 hour Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this period.

B.1 and B.2

If the CC~~W~~ train cannot be restored to OPERABLE status within the associated Completion Time, 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 3.7.7.1

This SR is modified by a Note indicating that the isolation of the CC~~W~~ flow to individual components may render those components inoperable but does not affect the OPERABILITY of the CCW System.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.7.1

This SR verifies~~Verifying~~ the correct alignment for manual, air ~~power~~-operated, and automatic valves in the CC~~W~~ flow path. This provides assurance that the proper flow paths exist for CC~~W~~ operation.

(continued)

PA3.7-145 PA3.7-201

BASES (continued)

This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves.

This SR~~Surveillance~~ does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. Control room indication may be used to fulfill this SR. PA3.7-272

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.7.2

This SR verifies proper automatic operation of the CCW valves on an actual or simulated safety injection actuation signal.

The CCW System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. This test is considered satisfactory if control board indication and visual observation of the equipment demonstrate that all components have operated properly. PA3.7-255

The 24~~[18]~~ month Frequency is based on engineering judgement and to allow ~~the need to~~ performance of this Surveillance under the conditions that apply during a unit outage ~~and the potential for an~~ X3.7-137 PA3.7-273

(continued)

PA3.7-145 PA3.7-201

BASES

~~unplanned transient if the Surveillance were performed with the reactor at power~~. Although this SR may be performed during normal power operation, there may be plant conditions when it is advantageous to perform this Surveillance during a unit outage.

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.

This SR is modified by a Note stating that the SR applies to those valves required to align CC System to support the safety injection or recirculation phases of emergency core cooling. CL3.7-140

SR 3.7.7.3

The CC pumps may be actuated by either a safety injection signal or system low pressure. CL3.7-264 This SR verifies proper automatic operation of the CCW pumps on an actual or simulated safety injection actuation signal and verifies proper automatic operation of the CC pumps on an actual or simulated low pressure actuation signal. PA3.7-255 This test is considered satisfactory if control board indication and visual observation of the equipment demonstrate that all components have operated properly.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.7.3

The CCW System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation.

The 24~~[18]~~ month Frequency is based on engineering judgement and to allow ~~the need to~~ performance of 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~~. Although this SR may be

PA3.7-145 PA3.7-201

BASES

performed during normal power operation, there may be plant conditions when it is advantageous to perform this Surveillance during a unit outage. PA3.7-273

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.

REFERENCES 1. UFSAR, Section 10.4~~[9.2.2]~~.

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

B 3.7 PLANT SYSTEMS

PA3.7-201

B 3.7.8 Cooling~~Service~~ Water (CL) System ~~(SWS)~~

PA3.7-146

BASES

BACKGROUND

The CL System is a shared system common to both units. The CL System~~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 CL System~~SWS~~ also provides this function for various safety related and nonsafety related components. The safety related function is covered by this LCO.

The CL System~~SWS~~ consists of a common CL pump discharge header for the five CL (2 nonsafeguards, 2 safeguards, 1 that can be designated as safeguards or nonsafeguards) pumps that directs flow into two separate, 100% capacity, ~~safety related, cooling water~~ CL headers~~trains~~. Each header then supplies loops in the turbine and auxiliary buildings and containments for the two units. CL3.7-274

Each safeguards CL train consists of:

a. One ~~two~~ 100% capacity vertical safeguards pumps (12 or 121 for Train A; 22 or 121 for Train B);~~.~~
b. A header; and
c. ~~One component cooling water (CCW) heat exchanger,~~ Piping, valving, instrumentation and controls~~, and two cyclone separators~~.

The vertical motor driven pump (121) may be directed to supply either CL header when aligned in its safeguards mode of operation. In this case, the vertical motor driven pump (121) may replace a vertical diesel driven pump.

(continued)

PA3.7-146 PA3.7-201

BASES

The vertical motor driven pump may be powered from a pre-selected independent power source (one of the Unit 2 redundant safeguards 4 kV buses and associated diesel generator, i.e., 121 CL pump can be aligned to fulfill a Train A or Train B function). CL3.7-274

A single CL pump can provide sufficient cooling in one unit during the injection and recirculation phases of a postulated loss of coolant accident plus sufficient cooling to maintain the second unit in a safe shutdown condition.

The CL pump discharge header contains redundant motor-operated header isolation valves (MV-32034, MV-32035, MV-32036, and MV-32037) that assure at least one OPERABLE safeguards pump is aligned to each safeguards supply header when functioning under accident conditions. ~~The pumps and valves are remote and manually aligned, except in the unlikely event of a loss of coolant accident (LOCA).~~

The safeguards diesel driven pumps and the vertical motor driven pump (when aligned in the safeguards mode) ~~aligned to~~ supply the ~~critical loops~~ safeguards components after being ~~are~~ automatically started upon receipt of a safety injection or header low pressure signal~~, and all essential valves are aligned to their post accident positions~~.

Principal post accident heat loads supplied by the CL System include Unit 1 diesel generators, control room chillers, component cooling (CC) heat exchangers, containment fan coil units, and the nonsafeguards instrument air compressors.

The cooling water supplied to all safeguards and nonsafeguards equipment from supply header A is normally discharged through the Train A CL return header to the Unit 1 Circulating Water (CW) return header. The cooling water supplied to all safeguards and nonsafeguards equipment from

(continued)

supply header B is normally returned through the Train B CL return header to the Unit 2 CW discharge header. The auxiliary feed pumps, safeguards traveling screens, and filtered water supplies do not have return lines. CL3.7-274

The two CL return headers are connected through two normally closed, motor-operated isolation valves. An emergency dump to grade is connected between the isolation valves. The dump to grade requires manual actuation of the motor valve, either locally or from the main control room. Each of the return headers discharges to a standpipe in the turbine building which directs the cooling water to the CW discharge piping. Each of the standpipes is equipped with an overflow line to the ground outside the turbine building.

The CL System~~SWS~~ also provides ~~emergency makeup to the spent fuel pool and CCW System [and is~~ the backup safeguards water supply to the Auxiliary Feedwater System~~]~~ (LCO 3.7.5).

The CL System, in conjunction with the CC System, also cools the unit from residual heat removal (RHR) entry conditions to MODE 5 during normal and post accident operations, as discussed in the USAR (Ref. 1). The time required for this evolution is a function of the number of CC and RHR System trains that are operating. One CL train is sufficient to remove decay heat during subsequent operations in MODES 5 and 6.

Additional information about the design and operation of the CL System~~SWS~~, along with a list of the components served, is presented in the UFSAR~~, Section [9.2.1]~~ (Refs. 1 and 2). ~~The principal safety related function of the SWS is the removal of decay heat from the reactor via the CCW System.~~

(continued)

PA3.7-146 PA3.7-201

BASES

APPLICABLE SAFETY ANALYSES

The design basis of the CL SystemSWS is to maintain cooling for the heat loads of one unit in MODE 3 and the second unit in long term post accident condition. CL3.7-276

~~for~~ One CLSWS train, in conjunction with the CCW System and a 100% capacity containment cooling system , has the capability to remove long term core decay heat following a design basis LOCA as discussed in the UFSAR~~, 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 Emergency Core Cooling System (ECCS) pumps. The CL SystemSWS is designed to perform its function with a single failure of any active component, assuming the loss of offsite power.

~~The SWS, in conjunction with the CCW System, also cools the unit from residual heat removal(RHR), as discussed in the FSAR, Section [5.4.7], (Ref. 3) entry conditions to MODE 5 during normal and post accident operations.~~

~~The time required for this evolution is a function of the number of CCW 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 CLSWS temperature of ~~[~~95~~]~~°F occurring simultaneously with design~~maximum~~ heat loads for ~~on~~ the system.

The CLSWS System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii)~~the NRC Policy Statement~~.

(continued)

LCO

Two CL~~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.

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

a. The safeguards CL pump, aligned to the train, is OPERABLE; ~~and~~ CL3.7-277

b. The associated header is OPERABLE; and

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

A diesel driven safeguards CL pump is considered OPERABLE when: CL3.7-277

a. The pump can meet the design flow/pressure requirements in accordance with the Inservice Testing Program;

b. The associated piping, valves, auxiliaries, and instrumentation and controls required to perform the safety related function are OPERABLE; and

c. There is a minimum fuel oil supply of 19,500 gallons available for the diesel driven safeguards pumps.

The 121 CL pump starts during low header pressure conditions and it functions as a backup source replacing a diesel driven safeguards CL pump. In this latter case, additional requirements for OPERABILITY are specified.

121 CL pump is considered OPERABLE when:

(continued)

PA3.7-146 PA3.7-201

BASES

a. The pump can meet the design flow/pressure requirements in accordance with the Inservice Testing Program; and

b. The associated piping, valves, and instrumentation and controls required to perform the safety related function are OPERABLE. CL3.7-277

121 CL pump is considered OPERABLE as the safeguards substitute for 12 diesel driven CL pump when:

a. The pump can meet the design flow/pressure requirements in accordance with the Inservice Testing Program;

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

c. MV-32037 or MV-32036 are closed and the associated breaker is locked in OFF position;

d. MV-32034 and MV-32035 are open and both breakers are locked in the OFF position; and

e. Bus 27 is supplied from Bus 25.

121 CL pump is considered OPERABLE as the safeguards substitute for 22 diesel driven CL pump when:

a. The pump can meet the design flow/pressure requirements in accordance with the Inservice Testing Program;

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

c. MV-32034 or MV-32035 are closed and the associated breaker is locked in OFF position;

d. MV-32036 and MV-32037 are open and both breakers are locked in the OFF position; and

(continued)

PA3.7-146 PA3.7-201

BASES

e. Bus 27 is supplied from Bus 26.

A header is considered to be OPERABLE when the associated piping, valves, and instrumentation and controls can perform the required safety related functions: CL3.7-277

a. Provide flow and cooling for the required safeguards components supplied from the header; and

b. Provide necessary isolation functions required for the header during a safeguards actuation.

Removal of return header piping or components from service does not automatically make the system inoperable. Factors to consider during an OPERABILITY determination are:

a. If the piping or component inoperability results in an individual component being incapable of heat removal, the individual component is to be considered inoperable;

b. If the piping or component inoperability results in required components in a train being incapable of heat removal, the train is to be considered inoperable; and

c. If cooling flow for the required components can be maintained by opening the emergency dump to grade path, by routing to the other unit's discharge header, or overflow from the turbine building standpipes, the train or components are not considered inoperable.

APPLICABILITY

The CL System specification is applicable for single or two unit operation. PA3.7-281

In MODES 1, 2, 3, and 4, the CL SystemSWS is a normally operating system that is required to support the

(continued)

PA3.7-146 PA3.7-201

BASES

OPERABILITY of the equipment serviced by the CL~~SWS~~ System and required to be OPERABLE in these MODES.

In MODES 5 and 6, the OPERABILITY requirements of the CL System are~~SWS are~~ determined by the systems it supports.

ACTIONS

A.1

If no safeguards CL pumps are OPERABLE for one train, action must be taken to restore one CL safeguards pump to OPERABLE status within 7 days. CL3.7-147

Either the diesel driven CL pump for the train may be restored to OPERABLE status, or the 121 CL pump may be aligned to fulfill the safeguards function for the train that has no OPERABLE safeguards CL pump.

The 7 day Completion Time is based on:

a. Low probability of loss of offsite power during the period;

b. The low probability of a DBA occurring during this time period;

c. The safeguards cooling capabilities afforded by the remaining OPERABLE train; and

d. The capability to route water from the non-safeguards pumps, if needed.

Required Action A.1 is modified by 3 notes. Note 1 requires Unit 1 entry into the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating," for an emergency diesel generator made inoperable by the CL system. For Unit 1, the diesel generators are major heat loads supplied by the CL system. Thus, inoperability of two safeguards CL pumps will affect at least the heat loads on one CL header, including one Unit 1 diesel generator. Inability to adequately remove the heat from the diesel generator will render it inoperable.

(continued)

PA3.7-146 PA3.7-201

BASES

Note 2 requires entry into the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops - MODE 4", for both units for the RHR loops made inoperable by the CL System. If either unit is in MODE 4, inoperability of two safeguards CL pumps may affect all the heat loads on one CL header, including a CC train and subsequently one RHR heat exchanger on each unit. Inability to adequately remove the heat from a RHR heat exchanger will render it inoperable. CL3.7-147

Note 3 specifies that the Condition with no safeguard CL pumps OPERABLE for one train may not exist for more than 7 days in any consecutive 30 day period. If such a condition occurs, Condition C must be entered with the specified Required Action taken because the equipment reliability is less than considered acceptable.

ACTIONS

B.1 and B.2

If one CL~~SWS~~ supply header~~train~~ is inoperable, action must be taken to verify the vertical motor driven CL pump is OPERABLE within 4 hours, and restore the inoperable CL header to OPERABLE status within 72 hours. CL3.7-148

Verification of pump OPERABILITY does not require the pump to be aligned and may be performed by administrative means. Completion of the CL pump surveillance tests is not required.

Conditions may occur in the CL System piping, valves, or instrumentation downstream of the supply header (e.g., closed or failed valves, failed piping, or instrumentation in a return header) that can result in the supply header being considered inoperable. In such cases, Condition B and related Required Actions shall apply.

(continued)

In this Condition, the remaining OPERABLE CL~~SWS~~ header~~train~~ is adequate to perform the heat removal function. However, the overall redundancy~~reliability~~ is reduced because only a single CL train remains~~failure in the~~ OPERABLE~~SWS train could result in loss of SWS function~~.

Required Action B.1 ensures that the vertical motor driven 121 CL pump may be used to provide redundancy for the safeguards CL pump on the OPERABLE header. Required Action B.2 assures adequate system reliability is maintained. CL3.7-148

Required Actions B~~A~~.1 and B.2 are~~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 for Unit 1 since~~if~~ an inoperable CL~~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 CL~~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 4 and 72 hour Completion Times are~~is~~ based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time period. In addition, the 4 hour Completion Time for Required Actions B.1 and B.2 is within the time period anticipated to verify OPERABILITY of the required CL pump by administrative means.

(continued)

CB.1 and CB.2

If ~~the~~ at least one safeguards CL~~SWS~~ pump for a train or a CL supply header cannot be restored to OPERABLE status within the associated Completion Time, the units must be placed in a MODE in which the LCO does not apply. To achieve this status the units must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours. Required Actions C.1 and C.2 are modified by a single note which specifies the actions are applicable to both units. CL3.7-149

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

D.1

In this Condition, the 14 day fuel oil supply for the diesel driven CL pumps is not available. However, the Condition is restricted to fuel oil supply reductions that maintain at least a 12 day supply. This restriction allows sufficient time for obtaining the requisite replacement volume and performing the analyses required prior to addition of fuel oil to the tank(s). A period of 48 hours is considered sufficient to complete restoration of the required supply prior to declaring the diesel driven CL pumps inoperable. This period is acceptable based on the remaining 12 day fuel oil supply, the fact that procedures will be initiated to obtain replenishment, availability of the vertical motor driven CL pump and the low probability of an event during this brief period. PA3.7-159

(continued)

PA3.7-146 PA3.7-201

BASES

E.1

With the stored fuel oil supply not within the limits specified or Required Actions and associated Completion Times of Condition D not met, the diesel driven CL pumps may be incapable of performing their intended function and must be immediately declared inoperable. PA3.7-159

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

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

This SR verifiesVerifying the correct alignment for manual, power operated, and automatic valves in the CL SystemSWS flow path toprovides assuranee that the proper flow paths exist for CL SystemSWS operation. This SR does not apply to valves that are locked, sealed, or 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. PA3.7-272 Control room indication may be used to fulfill this SR. 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.

(continued)

PA3.7-146 PA3.7-201

BASES

SR 3.7.8.2

This SR verifies each diesel driven CL pump can be started and be up to operating speed and assumes load within one minute to provide assurance that equipment would perform as expected in the safety analysis. CL3.7-151

Diesel CL pump start will normally be initiated by the manual start switch. Once per calendar year, start should be initiated by use of the low pressure header pressure switch.

The 31 day Frequency is based on the experience that the CL pump usually passes the Surveillance when performed at this Frequency.

SR 3.7.8.3

This SR provides verification that there is an adequate inventory of fuel oil in the storage tanks to support the operation of one diesel driven CL pump for 14 days. The 14 day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an offsite location. PA3.7-159

The 31 day Frequency is adequate to ensure that a sufficient supply of fuel oil is available, since low level alarms are provided and plant operators would be aware of any large uses of fuel oil during this period.

SR 3.7.8.4

This SR verifies the vertical motor driven CL pump is OPERABLE to provide assurance that equipment, when lined up in the safeguards mode, will perform as expected in the safety analysis. CL3.7-151

For this test, an acceptable level of performance shall be:

(continued)

PA3.7-146 PA3.7-201

BASES

a. Pump starts and reaches required developed head; and

b. Control board indications and visual observations indicate that the pump is operating properly for at least 15 minutes.

The 92 day Frequency is based on the Inservice Testing Program requirements (Ref. 3).

Under some plant conditions, the vertical motor driven CL pump is required to operate to provide additional CL flow. When this pump is operated to support plant operations, this test can not be performed and this pump is considered inoperable as a safeguards CL pump. CL3.7-151

SR 3.7.8.5

This SR verifies proper automatic operation of the CL System~~SWS~~ valves on an actual or simulated safety injection actuation signal, including those valves that isolate non-essential equipment from the system. The CL System~~SWS~~ is a normally operating system that is shared between the two units and cannot be fully actuated as part of normal testing. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. CL3.7-282

These tests demonstrate the operation of the valves, pump circuit breakers, and automatic circuitry. CL3.7-282

Unit 1 SI actuation circuits for Train A and Train B valves shall be tested during Unit 1 refueling outages. Unit 2 SI actuation circuits for Train A and Train B valves shall be tested during Unit 2 refueling outages.

A test is considered satisfactory if control board indication and visual observations indicate that all components have operated satisfactorily and if cooling water flow paths required for accident mitigation have been established.

(continued)

PA3.7-146 PA3.7-201

BASES

The 24~~[18]~~ month Frequency is based on the need to perform this Surveillance under the conditions that apply during an ~~unit~~ outage of one unit (the other unit may be operating) and the potential for an unplanned transient in the unit affected by the tested components if the Surveillance were performed with that ~~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. X3.7-137

SR 3.7.8.6

The safeguards CL pumps may be actuated by either a safety injection (SI) signal or system low pressure. This SR verifies proper automatic operation of the diesel driven and vertical motor driven CL~~SWS~~ pumps on an actual or simulated safety injection actuation signal and verifies proper automatic operation of these pumps on an actual or simulated low pressure actuation signal. The CL~~SWS~~ is a normally operating system that cannot be fully actuated in a safeguards mode as part of normal testing during normal operation. A test is considered satisfactory if control board indication and visual observations indicate that all components have operated satisfactorily. CL3.7-153 CL3.7-283 CL3.7-282

The 24~~[18]~~ month Frequency is based on the need to perform the SI signal portion of this Surveillance under the conditions that apply during a unit X3.7-137

~~Sr 3.7.8.3 (continued)~~

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

REFERENCES

1. UFSAR, Section 10.4[9.2.1].
2. UFSAR, Section 6[6.2].
3. FSAR, Section [5.4.7]. ASME Boiler and Pressure Vessel Code, Section XI.

(continued)

B 3.7 PLANT SYSTEMS

PA3.7-201

CL3.7-154

B 3.7.9 Emergency Cooling Water (CL) Supply~~Ultimate Heat Sink (UHS)~~

BASES

BACKGROUND

CL3.7-284

The Emergency CL Supply is designed to provide a supply of screened cooling water (CL) following an earthquake that destroys Dam No. 3, dropping the water level in the normal intake canal supply to the screenhouse. The Emergency CL Supply consists of the Emergency CL Line and the two Safeguards Traveling Screens.

The emergency pump bay, located within the safeguards section of the screenhouse, houses the safeguards traveling screens, the motor-driven vertical CL pump, and the diesel-driven vertical CL pumps. Two normally open sluice gates, one from each unit's circulating water (CW) pump bay, provide water to the vertical CL pumps. Sluice gates may be used to isolate the emergency bay from the CW pump bays.

Under design basis seismic event conditions, water will be supplied to the emergency bay through an Emergency CL Line. The 36-inch pipe, buried in the approach canal and Circulating Water Intake Canal bottom, directs water from the deepest part of the river to the emergency bay. The intake end of the pipe is covered with a screen to minimize the amount of trash drawn into the pipe. The Emergency CL Line is designed to provide adequate flow at the lowest possible water elevation resulting from loss of Dam No. 3. The pipe is buried approximately 40 feet below the Circulating Water Intake Canal water level.

(continued)

PA3.7-201

CL3.7-154

BASES

Two safeguards traveling screens are designed to remove debris from the cooling water entering the emergency pump bay through the Emergency CL Line. Trash trays attached to the screens aid in carrying the trash to a trash trough. The screens have two speeds. The screens are backwashed with water supplied from the CL pump discharge.

CL3.7-284

~~The UHS a heat sink for processing and operating heat from safety related components during a transient or accident, as well as during normal operation.~~

~~This is done by utilizing the Service Water System (SWS) and the Component Cooling Water (CCW) System.~~

~~The UHS has been defined as that complex of water sources, including necessary retaining structures (e.g., a pond with its dam, or a river with its dam), and the canals or conduits connecting the sources with, but not including, the cooling water system intake structures as discussed in the FSAR, Section [9.2.5] (Ref. 1). If cooling towers or portions thereof are required to accomplish the UHS safety functions, they should meet the same requirements as the sink. The two principal functions of the UHS are the dissipation of residual heat after reactor shutdown, and dissipation of residual heat after an accident.~~

~~A variety of complexes is used to meet the requirements for a UHS. A lake or an ocean may qualify as a single source. If the complex includes a water source contained by a structure, it is likely that a second source will be required.~~

~~The basic performance requirements are that a 30 day supply of water be available, and that the design basis temperatures of safety related equipment not be exceeded.~~

(continued)

PA3.7-201

CL3.7-154

BASES

~~Basins of cooling towers generally include less than a 30 day supply of water, typically 7 days or less. A 30 day supply would be dependent on other source(s) and makeup system(s) for replenishing the source in the cooling tower basin. For smaller basin sources, which may be as small as a 1 day supply, the systems for replenishing the basin and the backup source(s) become of sufficient importance that the makeup system itself may be required to meet the same design criteria as an Engineered Safety Feature (e.g., single failure considerations), and multiple makeup water sources may be required.~~

BACKGROUND (continued)

Additional information on the design and operation of the Safeguards Traveling Screens~~system, along with a list of components served,~~ and the Emergency CL Line can be found in Reference 1.

APPLICABLE SAFETY ANALYSES

~~The UHS is the sink for heat removed from the reactor core following all accidents and anticipated operational occurrences in which the unit is cooled down and placed on residual heat removal (RHR) operation. For units that use UHS as the normal heat sink for condenser cooling via the Circulating Water System, unit operation at full power is its maximum heat load. Its maximum post accident heat load occurs 20 minutes after a design basis loss of coolant accident (LOCA). Near this time, the unit switches from injection to recirculation and the containment cooling systems and RHR are required to remove the core decay heat.~~

~~The operating limits are based on conservative heat transfer analyses for the worst case LOCA. Reference 1 provides the details of the assumptions used in the analysis, which include worst expected meteorological~~

(continued)

PA3.7-201

CL3.7-154

BASES

~~conditions, conservative uncertainties when calculating decay heat, and worst case single active failure (e.g., single failure of a manmade structure). The UHS is designed in accordance with Regulatory Guide 1.27 (Ref. 2), which requires a 30 day supply of cooling water in the UHS.~~

The Design Basis Earthquake provides the basis for the Emergency CL Supply. This safety analysis assumes that Dam No. 3 is destroyed by the seismic event, such that supply through the Emergency CL Line is required. Under these conditions, trash removal by the safeguards traveling screens is required. CL3.7-286

The Emergency CL Supply~~UHS~~ satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii)~~the NRC Policy Statement~~.

LCO

This specification applies to single or dual unit operation.

The Emergency CL Supply is a passive gravity fed supply to the safeguards CL pumps intended only for the case of a seismic event that destroys Dam No. 3 resulting in low level in the intake canal. In this low probability event, the safeguards traveling screens would be required to remove debris from the water supply to the pumps. CL3.7-287

~~The UHS is required to be OPERABLE and is considered OPERABLE if it contains a sufficient volume of water at or below the maximum temperature that would allow the SWS to operate for at least 30 days following the design basis LOCA without the loss of net positive suction head (NPSH), and without exceeding the maximum design temperature of the equipment served by the SWS. To meet this condition, the UHS temperature should not exceed [90°F] and the level~~

(continued)

PA3.7-201

CL3.7-154

BASES (continued)

~~should not fall below [562 ft mean sea level] during normal unit operation.~~

Both safeguards traveling screens are required to be OPERABLE. A safeguards traveling screen is considered OPERABLE when: CL3.7-287

a. The valve, instrumentation and controls required to provide the screen backwash function are OPERABLE; and

b. The safeguards traveling screen can turn.

Safeguards traveling screen OPERABILITY is not required for OPERABILITY of the safeguards CL pumps (LCO 3.7.8).

The Emergency CL Line is OPERABLE when a flow path through the pipe exists.

APPLICABILITY

With either unit i~~I~~n MODES 1, 2, 3, and 4, the ~~UHS~~Safeguards Traveling Screens and Emergency CL Line are~~is~~ required to support the OPERABILITY of the equipment serviced by the CL System during the design basis condition~~UHS~~ and required to be OPERABLE in these MODES.

With both units i~~I~~n MODE 5 or 6, the OPERABILITY requirements of the Emergency CL Supply~~UHS~~ are determined by the systems it supports. The design basis does not include shutdown conditions.

ACTIONS

The ACTIONS table is modified by a Note indicating that the Conditions and Required Actions are CL3.7-155

(continued)

PA3.7-201

CL3.7-154

BASES (continued)

applicable to both units. This is appropriate since the Emergency CL Supply is shared by the two units.

A.1 and A.2

If one safeguards traveling screen is inoperable, action must be taken to verify an emergency bay sluice gate is open within 4 hours, and restore that safeguards traveling screen to OPERABLE status within 90 days.

CL3.7-156

In this Condition, the remaining OPERABLE safeguards traveling screen or open emergency bay sluice gate is adequate to provide the CL supply to any of the three vertical CL pumps during any design basis condition.

Required Action A.1 is modified by a Note which states the action is not required during testing periods of less than 24 hours.

The 4 hour Completion Time is based on the redundant capability afforded by the OPERABLE safeguards traveling screen.

The 90 day Completion Time is based on:

a. The redundant capability afforded by the remaining OPERABLE safeguards traveling screen;

b. The low risk impact of an inoperable safeguards traveling screen; and

c. The low probability of a high magnitude earthquake that could destroy Dam No. 3 during this time interval.

(continued)

PA3.7-201

CL3.7-154

BASES (continued)

ACTIONS

B.1 and B.2

If both safeguards traveling screens are inoperable, action must be taken to verify one emergency bay sluice gate is open within 1 hour, and restore one safeguards traveling screen to OPERABLE status within 7 days. CL3.7-156

In this Condition, the open emergency bay sluice gate is adequate to perform the CL supply function except in those cases where use of the Emergency CL Line is needed. As a result, overall reliability is reduced.

The 7 day Completion Time is based on the low probability of a design basis earthquake occurring during this time interval.

ACTIONS

~~A.1~~ and C.2

If the Emergency CL Line is~~one or more cooling towers have one fan~~ inoperable ~~(i.e., up to one fan per cooling tower inoperable)~~, action must be taken to verify one emergency bay sluice gate is open within 1 hour, and restore the ~~inoperable cooling tower fan(s)~~ Emergency CL Line to OPERABLE status within 7 days. CL3.7-157

The 1 hour and 7 day Completion Times are~~is~~ reasonable based on the low probability of ~~an accident~~a design basis earthquake occurring during the 7 days that the Emergency CL Line~~one cooling tower fan~~ is inoperable ~~(in one or more cooling towers)~~, the ~~number of available~~availability of other water sources~~systems~~, and the time required to reasonably complete the Required Actions.

(continued)

PA3.7-201

CL3.7-154

BASES (continued)

BD.1 and BD.2

~~[~~If the Emergency CL Line or Safeguards Traveling Screen(s)~~cooling tower fan~~ cannot be restored to OPERABLE status within the associated Completion Time,~~ or] if the UHS is inoperable for reasons other than Condition A,~~ the unit~~s~~ must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit~~s~~ 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 3.7.9.1

PA3.7-158

This SR verifies that the safeguards traveling screens can adequately filter (screen) water and that the screens can backwash as needed. ~~adequate long term (30 day) cooling can be maintained.~~

This SR verifies that:

a. The backwash supply valve will open;

b. Backwash water pressure is sufficient; and

c. The safeguards traveling screens can turn.

~~The specified level also ensures that sufficient NPSH is available to operate the SWS pumps.~~

The 92 day~~[24] hour~~ Frequency is based on operating experience ~~related to trending of the parameter variations~~

(continued)

PA3.7-201

CL3.7-154

BASES

~~during the applicable MODES~~that demonstrates this interval is sufficient to ensure screen and support equipment reliability.

~~This SR verifies that UHS water level is ≥ [562] ft [mean sea level].~~

~~SR 3.7.9.2~~

~~This SR verifies that the SWS is available to cool the CCW System to at least its maximum design temperature with the maximum accident or normal design heat loads for 30 days following a Design Basis Accident. The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES.~~ CL3.7-161

~~This SR verifies that the average water temperature of the UHS is ≤ [90°F].~~

~~SR 3.7.9.3~~

~~Operating each cooling tower fan for ≥ [15] minutes ensures that all fans are OPERABLE and that all associated controls are functioning properly. It also ensures that fan or motor failure, or excessive vibration, can be detected for corrective action. The 31 day Frequency is based on operating experience, the known reliability of the fan units, the redundancy available, and the low probability of significant degradation of the UHS cooling tower fans occurring between surveillances.~~ CL3.7-161

~~SR 3.7.9.4~~

~~This SR verifies that each cooling tower fan starts and operates on an actual or simulated actuation signal. The [18] month Frequency is consistent~~ CL3.7-161

PA3.7-201

CL3.7-154

BASES

~~with the typical refueling cycle. 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.~~

~~REFERENCES~~

1. ~~FSAR, Section [9.2.5]~~USAR, Section 10.4.

~~2. Regulatory Guide 1.27.~~

B 3.7 PLANT SYSTEMS PA3.7-201

B 3.7.10 Control Room Special Ventilation ~~Emergency Filtration~~ System (CRSVS) (~~CREFS~~)

PA3.7-162

BASES

BACKGROUND

The ~~CREFS~~CRSVS provides a protected environment from which operators can control the unit following an uncontrolled release of radioactivity~~[, chemicals, or toxic gas]~~. CL3.7-166

The ~~CREFS~~CRSVS consists of two independent, redundant trains that recirculate and filter the control room air. Each train consists of a prefilter~~ or demister~~, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a cleanup fan. CL3.7-291

Ductwork, valves or dampers, and instrumentation also form part of the system~~, as well as demisters to remove water droplets from the air stream~~. ~~A second bank of HEPA filters follows the adsorber section to collect carbon fines and provide backup in case of failure of the main HEPA filter bank~~.

The ~~CREFS~~CRSVS is an emergency system, parts of which may also operate during normal unit operations~~ in the standby mode of operation~~.

Upon receipt of the actuating signal(s), normal air supply to the control room is isolated, and the stream of ventilation air is recirculated through the system filter trains. The prefilters ~~or demisters~~remove any large particles in the air, and any entrained water droplets present, to prevent excessive loading of the HEPA filters and charcoal adsorbers.~~ Continuous operation of each train for at least 10 hours per month, with the heaters on,~~ CL3.7-291

(continued)

PA3.7-162 PA3.7-201

BASES

~~reduces moisture buildup on the HEPA filters and adsorbers. Both the demister and heater are important to the effectiveness of the charcoal adsorbers.~~

Actuation of the CRSVS ~~CREFS places the system in either of two separate states (emergency radiation state or toxic gas isolation state) of~~ in the emergency mode of operation, ~~depending on the initiation signal~~ is initiated by: CL3.7-292

a. High radiation in the control room ventilation duct; ~~or~~

b. Safety injection signal.

Actuation of the system ~~to the emergency radiation state of~~ in the emergency mode of operation~~,~~ closes the unfiltered outside air intake and unfiltered exhaust dampers, and aligns the system for recirculation of the control room air through the redundant trains of HEPA and the charcoal filters. The emergency ~~radiation state~~operating condition ~~also~~ initiates ~~pressurization and~~ filtered ventilation of the air supply to the control room.

~~BACKGROUND~~

~~(continued)~~

~~Outside air is filtered, diluted with building air from the electrical equipment and cable spreading rooms, and added to the air being recirculated from the control room. Pressurization of the control room prevents infiltration of unfiltered air from the surrounding areas of the building. The actions taken in the toxic gas isolation state are the same, except that the signal switches control room ventilation to an isolation alignment to prevent outside air from entering the control room.~~ CL3.7-291

~~The air entering the control room is continuously monitored by radiation and toxic gas detectors. One detector output~~

(continued)

~~above the setpoint will cause actuation of the emergency radiation state or toxic gas isolation state, as required. The actions of the toxic gas isolation state are more restrictive, and will override the actions of the emergency radiation state.~~

~~A single train will pressurize the control room to about [0.125] inches water gauge.~~ The ~~CREFS~~CRSVS operation ~~in maintaining the control room habitable~~ is discussed in the UFSAR~~, Section [6.4]~~ (Ref. 1).

Redundant supply and recirculation trains provide the required filtration should an excessive pressure drop develop across the other filter train. Normally open isolation dampers are arranged in series pairs so that the failure of one damper to shut will not result in a breach of isolation. The ~~CREFS~~CRSVS is designed in accordance with Seismic Category I requirements.

The ~~CREFS~~CRSVS is designed to maintain the control room environment for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding a 5 rem whole body dose or its equivalent to any part of the body.

APPLICABLE SAFETY ANALYSES

The ~~CREFS~~CRSVS components are arranged in redundant, safety related ventilation trains. The location of components and ducting within the control room envelope ensures an adequate supply of filtered air to all areas requiring access. The ~~CREFS~~CRSVS provides airborne radiological protection for the control room operators, as demonstrated by the control room accident dose analyses for the most limiting design basis loss of coolant

(continued)

PA3.7-162 PA3.7-201

BASES

UFSAR ~~APPLICABLE SAFETY ANALYSES (continued)~~

accident~~,~~ fission product release presented in the ~~Chapter [15]~~(Ref. 2). The CRSVS function also plays a significant role in protecting control room personnel during a fuel handling accident in the spent fuel pool enclosure or the containment and a main steam line break (Ref. 2). ~~The analysis of toxic gas releases demonstrates that the toxicity limits are not exceeded in the control room following a toxic chemical release, as presented in Reference 1.~~ CL3.7-293

The worst case single active failure of a component of the ~~CREFS~~CRSVS~~, assuming a loss of offsite power,~~ does not impair the ability of the system to perform its design function.

The ~~CREFS~~CRSVS satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii)~~the NRC Policy Statement~~.

LCO

This LCO applies to single or dual unit operation since there is a single CRSVS for both units.

Two independent and redundant ~~CREFS~~CRSVS trains are required to be OPERABLE to ensure that at least one is available assuming a single failure disables the other train. Total system failure could result in exceeding ~~a~~ the whole body dose limit of 5 rem (Ref. 3) to the control room operator during the worst 4 week exposure following a postulated accident. ~~in the event of a large radioactive release.~~ CL3.7-294

The ~~CREFS~~CRSVS is considered OPERABLE when the individual components necessary to limit operator exposure are OPERABLE

(continued)

PA3.7-162 PA3.7-201

BASES

in both trains. A ~~CREFS~~CRSVS train is OPERABLE when the associated:

a. Cleanup f~~F~~an is OPERABLE;

b. HEPA filters and charcoal adsorbers are not excessively restricting flow, and are capable of performing their filtration functions; ~~and~~

c. ~~Heater, demister,~~ D~~d~~uctwork, valves, and dampers are OPERABLE, and air circulation can be maintained; and~~.~~ CL3.7-298

d. Instrumentation, including associated radiation monitor for starting the cleanup fan, is OPERABLE, or the system is aligned to perform its safety function and is operating. PA3.7-296

In addition, the control room boundary must be maintained, including the integrity of the walls, floors, ceilings, ductwork, and access doors.

Opening a door for personnel ingress or egress does not make the control room ventilation zone boundary inoperable. Blocking a door open (e.g., for maintenance) without a person present to close the door requires entry into an ACTION. PA3.7-297

APPLICABILITY In MODES 1, 2, 3, and 4 for either unit, ~~[5, and 6,] and during movement of irradiated fuel assemblies [and~~ CL3.7-164 TA3.7-165

(continued)

PA3.7-162 PA3.7-201

BASES

~~during CORE ALTERATIONS], CREFS~~CRSVS must be OPERABLE to control operator exposure during and following a DBA.

~~In [MODE 5 or 6], the CREFS is required to cope with therelease from the rupture of an outside waste gas tank.~~ CL3.7-164

In addition, d~~D~~uring movement of irradiated fuel assemblies ~~[and CORE ALTERATIONS]~~, the ~~CREFS~~CRSVS must be OPERABLE to cope with the release from a fuel handling accident. TA3.7-165

ACTIONS

A Note preceding the Actions table identifies that all Conditions and Required Actions are applicable to both units. Because of the common Control Room, both units can be affected. PA3.7-163

A.1

When one ~~CREFS~~CRSVS train is inoperable, action must be taken to restore OPERABLE status within 7 days.

In this Condition, the remaining OPERABLE ~~CREFS~~CRSVS train is adequate to perform the control room protection function. However, the overall redundancy~~reliability~~ is reduced because only a single CRSVS train remains~~failure in the~~ OPERABLE~~ CREFS train could result in loss of CREFS function~~.

The 7 day Completion Time is based on the low probability of a DBA or fuel handling accident occurring during this time period, and ability of the remaining train to provide the required capability. CL3.7-301

(continued)

PA3.7-162 PA3.7-201

BASES

B.1 and B.2

In MODE 1, 2, 3, or 4, if the inoperable ~~CREFS~~CRSVS train cannot be restored to OPERABLE status within the required Completion Time, ~~the~~ both units must be placed in a MODE that minimizes accident risk. To achieve this status, the units 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.

C.1~~, C.2.1,~~ and C.2~~.2~~

~~[In MODE 5 or 6, or] during movement of irradiated fuel assemblies [, or during CORE ALTERATIONS], i~~If the inoperable ~~CREFS~~CRSVS train cannot be restored to OPERABLE status within the required Completion Time, Required ~~A~~action C.1 must be taken to immediately place the OPERABLE ~~CREFS~~CRSVS train in the emergency mode. This is a reasonable action, based on engineering judgement, to assure the control room air is filtered in the event of an accident. ~~This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that any active failure would be readily detected.~~

TA3.7-165

PA3.7-302

An alternative to Required Action C.1 is to immediately suspend activities that could result in a release of radioactivity that might require isolation of the control room. Required Action C.2 ~~This~~ places the ~~unit~~ plant in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

(continued)

PA3.7-162 PA3.7-201

BASES

~~Required Action C.1 is modified by a Note indicating to place the system in the toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable.~~ CL3.7-166

D.1~~ and D.2~~

~~[In MODE 5 or 6, or]~~ If two CRSVS trains are inoperable during movement of irradiated fuel assemblies ~~[, or during CORE ALTERATIONS], with two CREFS trains inoperable~~, action must be taken immediately to suspend activities that could result in a release of radioactivity that might enter the control room. TA3.7-165

This places the ~~unit~~ plant in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position.

E.1

If both ~~CREFS~~CRSVS trains are inoperable in MODE 1, 2, 3, or 4, the ~~CREFS~~CRSVS may not be capable of performing the intended function and the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately for both units.

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal

(continued)

PA3.7-162 PA3.7-201

BASES

operating conditions on this system are not too severe, testing each train once every month provides an adequate check of this system. ~~Monthly heater operations dry out any moisture accumulated in the charcoal from humidity in the ambient air. [Systems with heaters must be operated for ≥ 10 continuous hours with the heaters energized.~~ Each train~~Systems~~ must be operated ~~without heaters need only be operated~~ for ≥ 15 minutes to demonstrate the system function~~s of the system.]~~ The 31 day Frequency is based on the reliability of the equipment and the two train redundancy availability. CL3.7-167

SR 3.7.10.2

This SR verifies that the required ~~CREFS~~CRSVS filter testing is performed in accordance with the [Ventilation Filter Testing Program (VFTP)]. ~~The CREFS filter tests are in accordance with Regulatory Guide 1.52 (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]. PA3.7-303

SR 3.7.10.3

The CRSVS may be actuated by either a safety injection signal or a high radiation signal. This SR verifies that each ~~CREFS~~CRSVS train starts and operates on an actual or simulated safety injection actuation signal and verifies each CRSVS train starts and operates on and actual or simulated high radiation signal. The Frequency of 24 ~~[18]~~ months allows performance when a unit is shutdown~~is specified in Regulatory Guide 1.52 (Ref. 3)~~. CL3.7-292 X3.7-137

(continued)

PA3.7-162 PA3.7-201

BASES

SR 3.7.10.4

This SR verifies ~~the integrity of the control room enclosure, and the assumed inleakage rates 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~~CRSVS. During the emergency mode of operation, the ~~CREFS~~CRSVS train is designed to provide 4000 ± 10% cfm ~~pressurize the control room ≥ [0.125] inches water gauge positive pressure with respect to adjacent areas in order to prevent unfiltered inleakage~~. ~~The CREFS is designed to maintain this positive pressure with one train at a makeup flow rate of [3000] cfm.~~ CL3.7-168

The Frequency of 24 ~~[18]~~ months on a STAGGERED TEST BASIS is consistent with ~~the guidance provided in NUREG-0800 (Ref. 4)~~industry component reliability experience. X3.7-137 CL3.7-304

REFERENCES

1. UFSAR, Section 10.3~~[6.4]~~.
2. UFSAR, Section~~Chapter~~ 14.9~~[15]~~.
3. 10 CFR 50 Appendix A, GDC Criterion 19~~Regulatory Guide 1.52, Rev. 2~~.
4. ~~NUREG-0800, Section 6.4, Rev. 2, July 1981.~~

B 3.7 PLANT SYSTEMS

PA3.7-201

B 3.7.11 Safeguards Chilled Water System (SCWS) ~~Control Room Emergency Air Temperature Control System (CREATCS)~~

PA3.7-169

BASES

BACKGROUND

The SCWS, a shared system between the two units, ~~CREATCS provides temperature control for the control room following isolation of the control room.~~ circulates chilled water to provide ambient air cooling to essential areas, including the control room, Unit 1 safeguards 4160 VAC and 480 VAC safeguards bus rooms, residual heat removal (RHR) pump pits, relay room, and the event monitoring equipment room. The system functions during normal plant operations and accident conditions. The system function is to remove heat generated by safety related equipment and accident conditions.

CL3.7-306

The SCWS~~CREATCS~~ consists of two separate, but normally cross-connected, closed 100% capacity loops. ~~independent and redundant trains that provide cooling and heating of recirculated control room air~~. Each loop~~train~~ consists of a header with water chiller, expansion tank, chilled water pump, unit coolers, ~~heating coils, cooling coils~~ piping, valves, instrumentation, and controls ~~to provide for control room temperature control~~.

~~The CREATCS is a subsystem providing air temperature control for the control room.~~
A safety injection (SI) signal closes the control room chiller outlet cross-connect air operated control valves, splitting the two headers so that each header is then supplied by the associated chilled water pump and chiller.

~~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~~

(continued)

BASES

~~control room between [70] °F and [85]°F.~~ The SCWS~~CREATCS~~ operation ~~in maintaining the control room temperature~~ is discussed in the UFSAR~~, Section [6.4]~~ (Ref. 1).

APPLICABLE SAFETY ANALYSES

The design basis of the SCWS ~~CREATCS~~ is to ~~maintain the control room temperature for 30 days of continuous occupancy~~remove heat produced by equipment located in the various rooms during worst case heatup scenarios. The heat removal rates exceed the design basis heat generation rates in the control room, Unit 1 safeguards 4kV and 480 VAC rooms, relay room, computer room, RHR pits, and event monitoring equipment room.

CL3.7-306

CL3.7-307

In event of a single failure affecting one loop of safeguards chilled water, the alternate loop is able to meet required heat load demands.

~~The CREATCS components are arranged in redundant, safety related trains. During emergency operation, the CREATCS maintains the temperature between [70] °F and [85]°F.~~

~~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, to ensure equipment OPERABILITY.~~

The SCWS~~CREATCS~~ satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii)~~the NRC Policy Statement~~.

(continued)

BASES (continued)

LCO

The SCWS is a shared system between the two units. CL3.7-306

Two 100% capacity loops~~independent and redundant trains~~ of the SCWS~~CREATCS~~ are required to be OPERABLE to ensure that at least one is available, assuming a single failure ~~disabling the other train~~. ~~Total system failure could result in the equipment operating temperature exceeding limits in the event of an accident.~~

Even if both loops should fail, operator actions are available in procedures to provide sufficient cooling to these rooms. The RHR pumps, 480V buses and 4KV buses can perform their functions without an immediate need for equipment heat removal and their long term OPERABILITY is handled by procedures as discussed in Reference 1. The control room and relay room can provide their functions for a shorter time period before replacement heat removal is required and long term operability is handled by procedures. CL3.7-311

The SCWS~~CREATCS~~ is considered to be OPERABLE when the individual components (chiller and chilled water pump) necessary to maintain the supplied components and rooms ~~control room temperature~~ are OPERABLE in both loops~~trains~~. ~~These components include the heating and cooling coils and associated temperature control instrumentation. In addition, the CREATCS must be operable to the extent that air circulation can be maintained.~~

A loop is OPERABLE when:

a. Chiller is OPERABLE;
b. Chilled water pump is OPERABLE;
c. Loop separation function, required during an accident, is OPERABLE; and
d. Supplied components are OPERABLE.

(continued)

BASES (continued)

APPLICABILITY

In MODES 1, 2, 3, and 4~~, [5, and 6,]~~ and during movement of irradiated fuel assemblies ~~[and during CORE ALTERATIONS]~~, the SCWS~~CREATCS~~ must be OPERABLE to ensure that the ~~control~~ room temperatures will not exceed equipment operational requirements in the essential areas this system serves following an accident~~isolation of the control room~~. TA3.7-165 PA3.7-171

In MODES 5 and 6, the OPERABILITY requirements of the SCWS are determined by the systems it supports. ~~[In MODE 5 or 6,] CREATCS may not be required for those facilities that do not require automatic control room isolation.~~

ACTIONS

The ACTIONS table is modified by a Note indicating that the Conditions and Required Actions are applicable for both units. PA3.7-171

A.1

With one SCWS~~CREATCS train~~ loop inoperable, action must be taken to restore OPERABLE status within 30 days.

In this Condition, the remaining OPERABLE SCWS~~CREATCS train~~ loop is adequate to~~ maintain the control room temperature within limits~~ provide cooling. However, the overall reliability is reduced because a single failure in the OPERABLE SCWS loop~~CREATCS train~~ could result in loss of SCWS~~CREATCS~~ function.

The 30 day Completion Time is based on the low probability of an event requiring SCWS loop separation~~control room isolation~~, the consideration that the remaining loop~~train~~ can provide the required protection, and that

(continued)

alternate safety or nonsafety related cooling means are available.

ACTIONS (continued)

B.1 and B.2

In MODE 1, 2, 3, or 4, if the inoperable SCWS~~CREATCS train~~ loop cannot be restored to OPERABLE status within the required Completion Time, the units must be placed in a MODE that minimizes the risk. PA3.7-169

To achieve this status, the units 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.

C.1~~, C.2.1~~, and C.2~~.2~~

~~[In MODE 5 or 6, or]~~ d~~D~~uring movement of irradiated fuel ~~[, or during CORE ALTERATIONS]~~, if the inoperable SCWS ~~CREATCS train~~ loop cannot be restored to OPERABLE status within the required Completion Time, the OPERABLE SCWS~~CREATCS train~~ loop must be placed in operation immediately. This action ensures that the required cooling function is provided~~remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that active failures will be readily detected~~. PA3.7-169

An alternative to Required Action C.1 is to immediately suspend activities that present a potential for releasing radioactivity that might require isolation of the control room. Required Action C.2~~This~~ places the units in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position.

(continued)

BASES

D.1~~ and D.2~~

~~[In MODE 5 or 6, or] d~~During movement of irradiated fuel assemblies ~~[, or during CORE ALTERATIONS]~~, with two SCWS~~CREATCS trains~~ loops inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the control room. PA3.7-169

This Action ~~places the unit in a condition that~~ minimizes risk. This does not preclude the movement of fuel to a safe position.

ACTIONS (continued)

E.1

If both SCWS~~CREATCS trains~~ loops are inoperable in MODE 1, 2, 3, or 4, the ~~control room~~ SCWS~~CREATCS~~ may not be capable of performing its intended function. Therefore, LCO 3.0.3 must be entered immediately. PA3.7-169

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

This SR verifies that the each SCWS loop actuates on an actual or simulated safety injection actuation signal ~~heat removal capability of the system is sufficient to remove the heat load assumed in the [safety analyses] in the control room. This SR consists of a combination of testing and calculations.~~ PA3.7-170

The 24 ~~[18]~~month Frequency on a STAGGERED TEST BASIS is appropriate since significant degradation of the SCWS ~~CREATCS~~ is slow and is not expected over this time period.

~~SURVEILLANCE REQUIREMENTS~~

(continued)

PA3.7-169 PA3.7-201

BASES

SR 3.7.11.2

This SR verifies that necessary components in each SCWS loop operate as required. PA3.7-170

The Frequency required by the Inservice Testing program (Ref. 2) is appropriate since degradation of the SCWS could be detected in a timely manner for the components specified based on the known reliability of the components and the loop redundancy.

REFERENCES

1. UFSAR, Section 10.4~~[6.4]~~.

2. Inservice Testing Program.

B 3.7 PLANT SYSTEMS

PA3.7-201

B 3.7.12 Auxiliary Building Special Ventilation System (ABSVS) ~~Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup System (PREACS)~~

PA3.7-172

BASES

BACKGROUND

The ABSVS is a standby ventilation system, common to the two units, that ~~ECCS PREACS~~ is designed to collect and filter~~s~~ air from the Auxiliary Building Special Ventilation (ABSV) boundary following~~from the area of the active ECCS components during the recirculation phase of~~ a loss of coolant accident (LOCA). ~~The ECCS PREACS, in conjunction with other normally operating systems, also provides environmental control of temperature and humidity in the ECCS pump room area and the lower reaches of the auxiliary building~~. The ABSV boundary contains those areas within the auxiliary building which have the potential for collecting significant containment leakage that could bypass the shield building and leakage from systems which could recirculate primary coolant during LOCA mitigation.

CL3.7-312

The ABSVS~~ECCS PREACS~~ consists of two independent and redundant trains. Each train consists of a heater, a prefilter~~ or demister~~, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan.

CL3.7-313

Ductwork, ~~valves or~~ dampers, and instrumentation also form part of the system~~, as well as demisters functioning to reduce the relative humidity of the air stream. A second bank of HEPA filters follows the adsorber section to collect carbon fines and provide backup in case the main HEPA filter bank fails. The downstream HEPA filter is not credited in the accident analysis, but~~

CL3.7-313

(continued)

PA3.7-172 PA3.7-201

BASES

~~serves to collect charcoal fines, and to back up the upstream HEPA filter should it develop a leak~~. The system initiates filtered ventilation of the ABSV boundary~~pump room~~ following receipt of a safety injection (SI) signal.

The exhaust from the main condenser air ejector is directed to the ABSVS for filtering prior to exhausting from the plant via the shield building stack to mitigate steam generator tube leakage.

CL3.7-312

~~The ECCS PREACS is a standby system., aligned to bypass the system HEPA filters and charcoal adsorbers. During emergency operations, the ECCS PREACS dampers are realigned, and fans are started to begin filtration. Upon receipt of the actuating Engineered Safety Feature Actuation System signal(s), normal air discharges from the ECCS pump room isolate, and the stream of ventilation air discharges through the system filter trains.~~ When the ABSVS actuates, the normal nonsafeguards supply and exhaust dampers close automatically, and the Auxiliary Building Normal Ventilation System supply and exhaust fans trip. The prefilters remove any large particles in the air, and With the heaters reduce the level of ~~any~~ entrained water droplets present, to prevent excessive loading of the HEPA filters and charcoal adsorbers. The primary purpose of the heaters is to maintain the relative humidity at an acceptable level.

CL3.7-314

~~The ECCS PREACS is discussed in the FSAR, Sections [6.5.1], [9.4.5], and [15.6.5] (Refs. 1, 2, 3, respectively) since it~~The ABSVS ~~may be~~would typically only be used for ~~normal, as well as~~ post accident~~,~~ atmospheric cleanup functions. ~~The primary purpose of the heaters is to maintain the relative humidity at an acceptable level, consistent with iodine removal efficiencies per Regulatory Guide 1.52~~

(continued)

PA3.7-172 PA3.7-201

BASES

~~(Ref. 4)the following consideration.~~ The ABSVS and ABSV boundary are discussed in the USAR (References 1, 2 and 3).

APPLICABLE SAFETY ANALYSES

The design basis of the ABSVS~~ECCS PREACS~~ is established by the large break LOCA. The potential leakage paths from the containment to the auxiliary building are discussed in Reference 1.

The system evaluation assumes a passive failure of the ECCS outside containment, such as an RHR~~SI~~ pump seal failure, during the recirculation mode (Ref. 4). In such a case, the system limits radioactive release to within the 10 CFR 100 (Ref. 5) limits~~, or the NRC staff approved licensing basis (e.g., a specified fraction of Reference 5 limits)~~. The analysis of the effects and consequences of a large break LOCA is presented in References 3 and 4. The ABSVS~~ECCS PREACS~~ also actuates following a small break LOCA, in those cases where the ECCS goes into the recirculation mode of long term cooling, to clean up releases of smaller leaks, such as from valve stem packing.

~~Two types of system failures are considered in the accident analysis: complete loss of function, and excessive LEAKAGE. Either type of failure may result in a lower efficiency of removal for any gaseous and particulate activity released to the ECCS pump rooms following a LOCA.~~ CL3.7-316

The ABSVS~~ECCS PREACS~~ satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii)~~the NRC Policy Statement~~.

LCO

Two independent and redundant trains of the ABSVS~~ECCS PREACS~~ are required to be OPERABLE to ensure that at least one is available, assuming that a single CL3.7-317

(continued)

PA3.7-172 PA3.7-201

BASES

failure disables the other train~~ coincident with loss of offsite power~~.

This OPERABILITY requirement ensures that~~ Total system failure could result in~~ the atmospheric releases in the event of a Design Basis Accident (DBA) in containment from ~~the~~ ECCS pump ~~room~~ leakage and containment leakage which bypasses the shield building would not result in doses exceeding 10 CFR 100 limits (Ref. 5)~~ in the event of a Design Basis Accident (DBA)~~. CL3.7-321

~~ECCS PREACS is considered OPERABLE when the individual components necessary to maintain the ECCS pump room filtration are OPERABLE in both trains.~~

An ~~ECCS PREACS~~ ABSVS train is considered OPERABLE when its associated:

LCO (continued)

a. Fan is OPERABLE;

b. HEPA filter and charcoal adsorbers ~~are not excessively restricting flow, and~~ are capable of passing their design flow and performing their filtration functions; and

c. Heater, ~~demister,~~ ductwork, ~~valves,~~ and dampers are OPERABLE and air circulation can be maintained.

The ABSV boundary is OPERABLE if both of the following conditions can be met: CL3.7-174

a. Openings in the ABSV boundary are under direct administrative control and can be reduced to less than 10 square feet within 6 minutes following an accident; and

(continued)

PA3.7-172 PA3.7-201

BASES

b. Dampers and actuation circuits that isolate the Auxiliary Building Normal Ventilation System following an accident are OPERABLE or can be manually isolated within 6 minutes following an accident. CL3.7-174

To reduce leakage from the Auxiliary Building, the Turbine Building roof exhauster fans must be capable of being de-energized within 30 minutes following a loss of coolant accident. CL3.7-322

The LCO is modified by a Note allowing the ABSV boundary to be opened under administrative controls. As discussed above, openings must be closed to less than 10 square feet within 6 minutes following an accident. CL3.7-174

APPLICABILITY

In MODES 1, 2, 3, and 4 for either unit, the ABSVS~~ECCS PREACS~~ is required to be OPERABLE~~ consistent with the OPERABILITY requirements of the ECCS~~. PA3.7-323

When both units are i~~I~~n MODE 5 or 6, the ABSVS~~ECCS PREACS~~ is not required to be OPERABLE~~ since the ECCS is not required to be OPERABLE~~.

ACTIONS

The Actions table is modified by a Note that indicates the Conditions and Required Actions are applicable to both units. This is appropriate because ABSVS is a shared system; thus ABSVS train inoperability can affect either or both units. CL3.7-173

(continued)

PA3.7-172 PA3.7-201

BASES

A.1

With one ABSVS~~ECCS PREACS~~ train inoperable, action must be taken to restore OPERABLE status within 7 days. During this time, the remaining OPERABLE train is adequate to perform the ABSVS~~ECCS PREACS~~ function.

The 7 day Completion Time is appropriate because the ABSVS risk contribution is substantially less than that for the ECCS (72 hour Completion Time)~~, and this system is not a direct support system for the ECCS~~. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining train to provide the required capability. PA3.7-323

Concurrent failure of two ABSVS~~ECCS PREACS~~ trains would result in the loss of functional capability; therefore, LCO 3.0.3 must be entered immediately.

B.1

With both ABSVS trains inoperable due to an inoperable ABSV boundary, action must be taken to restore OPERABLE status within 24 hours. CL3.7-174

The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the availability of the ABSVS to provide a filtered release (albeit with potential for some unfiltered leakage).

If the ABSV boundary cannot be restored to OPERABLE status within the associated Completion Time, both units must be placed in a MODE in which the LCO does not apply.

(continued)

PA3.7-172 PA3.7-201

BASES

CB.1 and CB.2

If an~~the~~ ABSVS~~ECCS-PREACS~~ train cannot be restored to OPERABLE status or the ABSV boundary cannot be restored to OPERABLE status within the associated Completion Time, both~~the~~ units must be placed in a MODE in which the LCO does not apply. CL3.7-174

To achieve this status, both~~the~~ units 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 3.7.12.1

This SR verifies that each ABSVS train can be manually started, the associated filter heater energizes, and the filter units remain sufficiently dried out to ensure they can perform their function. PA3.7-324

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not severe, testing each train once a month provides an adequate check on this system. Monthly heater operations, with air circulation through the filter, dries~~y~~ out any moisture that may have accumulated in the charcoal from humidity in the ambient air. ~~[Systems with heaters~~ Each ABSVS train must be operated ≥ 10 ~~continuous~~ hours per CL3.7-175

(continued)

PA3.7-172 PA3.7-201

BASES

month with the heaters energized. ~~Systems without heaters need only be operated for ≥ 15 minutes to demonstrate the function of the system.~~] The 31 day Frequency is based on the known reliability of equipment and the two train redundancy available.

SR 3.7.12.2

This SR verifies that the required ABSVS~~ECCS PREACS~~ testing is performed in accordance with the [Ventilation Filter Testing Program (VFTP)]. ~~The ECCS PREACS filter tests are in accordance with Reference 4.~~ PA3.7-303

The [VFTP] includes testing HEPA filter performance, charcoal adsorbers efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations).

Specific test Frequencies and additional information are discussed in detail in the [VFTP].

SR 3.7.12.~~3~~4

This SR verifies proper functioning of the ABSVS by verifying the integrity of the ABSV boundary and the ability of the ABSVS to maintain a negative pressure with respect to potentially uncontaminated adjacent areas. CL3.7-176

During the post accident mode of operation, the ABSVS is designed to maintain a slight negative pressure within the ABSV boundary with respect to the containment and shield building. CL3.7-176

Each ABSVS train is started from the control room and the following are verified:

(continued)

PA3.7-172 PA3.7-201

BASES

a. Associated Auxiliary Building Normal Ventilation System fans trip and dampers close; and

b. A measurable negative pressure is drawn within the ABSV boundary within 6 minutes after initiation, with a 10 square foot opening within the ABSV boundary.

The 92 day Frequency is based on the known reliability of equipment and the two train redundancy available.

SR 3.7.12.~~3~~4

This SR verifies that each ABSVS~~ECCS PREACS~~ train starts and operates on an actual or simulated safety injection actuation signal.

The 24~~[18]~~ month Frequency is consistent with industry reliability experience for similar equipment. The 24 month Frequency is acceptable since this system usually passes the Surveillance when performed ~~that specified in Reference 4~~.

X3.7-137

PA3.7-326

~~SR 3.7.12.4~~

~~This SR verifies the integrity of the ECCS pump room enclosure. The ability of the ECCS pump room to maintain a negative pressure, with respect to potentially uncontaminated adjacent areas, is periodically tested to verify proper functioning of the ECCS PREACS. During the [post accident] mode of operation, the ECCS PREACS is designed to maintain a slight negative pressure in the ECCS pump room, with respect to adjacent areas, to prevent unfiltered LEAKAGE. The ECCS PREACS is designed to maintain a ≤ [-0.125] inches water gauge relative to atmospheric pressure at a flow rate of[3000] cfm from the ECCS pump room. The Frequency of [18] months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. 6).~~

PA3.7-327

PA3.7-172 PA3.7-201

BASES

~~This test is conducted with the tests for filter penetration; thus, an [18] month Frequency on a STAGGERED TEST BASIS is consistent with that specified in Reference 4.~~

~~SR 3.7.12.5~~

~~Operating the ECCS PREACS bypass damper is necessary to ensure that the system functions properly. The OPERABILITY of the ECCS PREACS bypass damper is verified if it can be specified in Reference 4.~~

CL3.7-177

REFERENCES

1. UFSAR, Appendix G~~Section [6.5.1]~~.
2. UFSAR, Section 10.3~~[9.4.5]~~.
3. UFSAR, Section 14~~[15.6.5]~~.
4. USAR, Section 6.7~~Regulatory Guide 1.52 (Rev. 2)~~.
5. 10 CFR 100.11.
6. ~~NUREG-0800, Section 6.5.1, Rev. 2, July 1981.~~

B 3.7 PLANT SYSTEMS

PA3.7-201

B 3.7.13 Spent Fuel Pool Special Ventilation~~Building Air Cleanup~~ System (SFPSVS)~~(FBACS)~~

PA3.7-178

BASES

BACKGROUND

In this Specification, the spent fuel pool enclosure refers to the concrete building that contains the racks and storage pool used to store new and spent fuel. PA3.7-331

SFPSVS refers to that portion of the Spent Fuel Special and Containment Inservice Purge system that provides the spent fuel pool enclosure air cleanup function.

The SFPSVS~~FBACS~~ filters airborne radioactive particulates from the area of the spent fuel pool following a fuel handling accident ~~or loss-of-coolant accident (LOCA)~~in that area. PA3.7-178

The Spent Fuel Pool Special Ventilation fans exhaust air to prefilter-absolute-charcoal (PAC) filters, then to the associated Shield Building vent stack (Unit 1 for Train A; Unit 2 for Train B)~~The FBACS, in conjunction with other normally operating systems, also provides environmental control of temperature and humidity in the fuel pool area~~. CL3.7-332

The SFPSVS~~FBACS~~ consists of two independent and redundant trains, each capable of meeting the design requirements.

Each train consists of a heater, a prefilter~~or demister~~, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan. CL3.7-332

(continued)

BASES (continued)

Ductwork, ~~valves or~~ dampers, and instrumentation also form part of the system~~, as well as~~ Heaters~~demisters,~~ function~~ing~~ to reduce the relative humidity of the airstream. ~~A second bank of HEPA filters follows the adsorber section to collect carbon fines and provide backup in case the main HEPA filter bank fails. The downstream HEPA filter is not credited in the analysis, but serves to collect charcoal fines, and to back up the upstream HEPA filter should it develop a leak.~~ CL3.7-332

The system initiates filtered ventilation of the spent fuel pool enclosure~~handling building~~ following receipt of a high radiation signal from a radiation detector located in the exhaust ducting of the spent fuel pool normal ventilation system. One detector actuates Train A equipment; the other actuates Train B equipment. CL3.7-314

The SFPSVS~~FBACS~~ is a standby system~~, parts of which may also be operated during normal plant operations~~. Upon receipt of the actuating signal, normal air supply to and discharge~~s~~ from the ~~building~~spent fuel pool ventilation system~~, the~~ are~~fuel handling building is~~ isolated, and the stream of ventilation air discharges through the two SFPSVS~~system~~ filter trains. The prefilters ~~or demisters~~ remove any large particles in the air, and the heaters remove any entrained water droplets present, to prevent excessive loading of the HEPA filters and charcoal adsorbers. The SFPSVS~~FBACS~~ is discussed in the UFSAR~~, [6.5.1], [9.4.5], and [15.7.4]~~ (Refs. 1, 2, and 3~~, respectively)~~ ~~because it may be used for normal, as well as post-accident, atmospheric cleanup functions~~. CL3.7-314

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The SFPSVS~~FBACS~~ design basis is established by the consequences of the limiting Design Basis Accident (DBA), ~~which is~~ a fuel handling accident (FHA) in the spent ~~f~~Fuel pool enclosure ~~Building~~. LCO 3.9.4, "Containment Penetrations," separately addresses a fuel handling accident in containment. PA3.7-333

The analysis of the fuel handling accident, given in Reference 3, assumes that all fuel rods in an assembly are damaged. ~~The analysis of the LOCA assumes that radioactive materials leaked from the Emergency Core Cooling System (ECCS) are filtered and adsorbed by the FBACS.~~ The DBA analysis of the fuel handling accident assumes that only one train of the SFPSVS~~FBACS~~ is functional due to a single failure that disables the other train. The accident analysis accounts for the reduction in airborne radioactive material provided by the one remaining train of this filtration system. The amount of fission products available for release from the spent fuel pool enclosure ~~handling building~~ is determined for a fuel handling accident ~~and for a LOCA~~. These assumptions and the analysis follow the guidance provided in Regulatory Guide 1.25 (Ref. 4). CL3.7-181

The SFPSVS~~FBACS~~ satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii) ~~the NRC Policy Statement~~.

LCO

Two independent and redundant trains of the SFPSVS~~FBACS~~ are required to be OPERABLE to ensure that at least one train is available, assuming a single failure ~~that~~ disables the other train ~~, coincident with a loss of offsite power~~. This OPERABILITY requirement ensures that ~~Total system failure could result in~~ the atmospheric release from a fuel handling accident in the spent fuel pool enclosure ~~fuel handling building~~ would not CL3.7-334 CL3.7-317

(continued)

BASES (continued)

result in doses exceeding the 10 CFR 100 ~~(Ref. 5)~~ limits ~~in the event of a fuel handling accident~~.

The ~~FBACS~~SFPSVS is considered OPERABLE when the individual components necessary to control offsite exposure ~~in the fuel handling building~~ are OPERABLE in both trains. An ~~FBACS~~SFPSVS train is considered OPERABLE when its associated:

a. Fan is OPERABLE;

b. HEPA filter and charcoal adsorber ~~are not excessively restricting flow, and~~ are capable of passing their design flow and performing their filtration function; ~~and~~ CL3.7-334

c. Heater, ~~demister,~~ ductwork, ~~valves,~~ and dampers are OPERABLE~~, and air circulation can be maintained.~~

d. Spent Fuel Pool Normal Ventilation train radiation monitor is OPERABLE; and

e. Spent Fuel Pool Normal Ventilation train is running.

Opening a personnel door for personnel ingress or egress does not make the SFPSVS boundary inoperable. Blocking the door open is not allowed (Ref. 5). PA3.7-297

APPLICABILITY

~~In MODE 1, 2, 3, or 4, the FBACS is required to be OPERABLE to provide fission product removal associated with ECCS leaks due to a LOCA and leakage from containment and annulus.~~ CL3.7-181

~~In MODE 5 or 6, the FBACS is not required to be OPERABLE since the ECCS is not required to be OPERABLE.~~

(continued)

BASES (continued)

During movement of irradiated fuel in the spent fuel pool enclosure ~~handling area~~, the SFPSVS~~FBACS~~ is required to be OPERABLE to alleviate the consequences of a fuel handling accident.

ACTIONS

The ACTIONS table is modified by a Note stating LCO 3.0.3 is not applicable. LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operation. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shut down unnecessarily. TA3.7-183

A.1

With one SFPSVS~~FBACS~~ train inoperable, action must be taken to restore OPERABLE status within 7 days. PA3.7-178

During this period, the remaining OPERABLE train is adequate to perform the SFPSVS~~FBACS~~ function.

The 7 day Completion Time is based on the risk from an event occurring requiring the inoperable SFPSVS~~FBACS~~ train, and the remaining SFPSVS~~FBACS~~ train providing the required protection.

(continued)

~~B.1 and B.2~~

~~In MODE 1, 2, 3, or 4, when Required Action A.1 cannot be completed within the associated Completion Time, or when both FBACS trains 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 MODE 3 within 6 hours, and in MODE 5 within 36 hours. The 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.~~ CL3.7-181

B~~C~~.1 and B~~C~~.2

When Required Action A.1 cannot be completed within the required Completion Time, during movement of irradiated fuel assemblies in the spent fuel pool enclosure~~building~~, the OPERABLE SFPSVS~~FBACS~~ train must be started immediately or fuel movement suspended. This is a reasonable action, based on engineering judgement, to assure that spent fuel pool enclosure releases are filtered in the event of an accident. ~~This action ensures that the remaining train is OPERABLE, that no undetected failures preventing system operation will occur, and that any active failure will be readily detected.~~ PA3.7-178 PA3.7-302

An alternative to Required Action B.1 is to immediately suspend activities that could result in a release of radioactivity. Required Action B.2 places the plant in a condition that minimizes risk. If the system is not placed in operation, this action requires suspension of fuel movement, which precludes a fuel handling accident. PA.7-336

(continued)

BASES

This does not preclude the movement of fuel assemblies to a safe position.

~~C~~D.1

When two trains of the SFPSVS~~FBACS~~ are inoperable during movement of irradiated fuel assemblies in the spent fuel pool enclosure~~building~~, action must be taken immediately to suspend movement of irradiated fuel assemblies in the spent fuel pool enclosure~~building~~. This does not preclude the movement of fuel to a safe position. PA3.7-178

SURVEILLANCE REQUIREMENTS

SR 3.7.13.1

This SR verifies that each SFPSVS train can be started, and that the associated filter units and heaters can perform their function. PA3.7-324

Standby systems should be checked periodically to ensure that they function properly. As the environmental and normal operating conditions on this system are not severe, testing each train once every month provides an adequate check on this system.

Monthly heater operation dries out any moisture accumulated in the charcoal from humidity in the ambient air. ~~[Systems~~ Each SFPSVS train must be operated with heaters energized ~~must be operated~~ for ≥ 10 ~~continuous~~ hours ~~with the heaters energized. Systems without heaters need only be operated for ≥ 15 minutes to demonstrate the function of the system.]~~ The 31 day Frequency is based on the known reliability of the equipment and the two train redundancy available. CL3.7-184

(continued)

BASES

SR 3.7.13.2

This SR verifies that the required SFPSVS~~FBACS~~ testing is performed in accordance with the ~~[~~Ventilation Filter Testing Program (VFTP)~~]~~. ~~The FBACS filter tests are in accordance with Regulatory Guide 1.52 (Ref. 6).~~ PA3.7-303

The ~~[~~VFTP~~]~~ includes testing HEPA filter performance, charcoal adsorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal (general use and following specific operations).

Specific test frequencies and additional information are discussed in detail in the ~~[~~VFTP~~]~~.

SR 3.7.13.3

This SR verifies that each SFPSVS~~FBACS~~ train starts and operates on an actual or simulated radiation monitor actuation signal. CL3.7-338

The 24~~[18]~~ month Frequency is consistent with the VFTP~~Reference 6~~. X3.7-137

PA3.7-337

SR 3.7.13.4

This SR verifies the ~~integrity of the fuel building enclosure. The~~ ability of the SFPSVS fan ~~fuel building~~ to maintain the design flow rate of CL3.7-185

(continued)

BASES (continued)

~~5200 ± 10% cfmnegative pressure with respect to potentially uncontaminated adjacent areas is periodically tested to verify proper function of the FBACS. During the [post accident] mode of operation, the FBACS is designed to maintain a slight negative pressure in the fuel building, to prevent unfiltered LEAKAGE. The FBACS is designed to maintain a ≤ [-0.125] inches water gauge with respect to atmospheric pressure at a flow rate of [20,000] cfm to the fuel building. The Frequency of [18] months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. 7).~~

An 24~~[18]~~ month Frequency (on a STAGGERED TEST BASIS) is consistent with industry reliability experience for similar equipment~~Reference 6~~. The 24 month Frequency on a STAGGERED TEST BASIS is acceptable since this system usually passes the Surveillance when performed. X3.7-137 PA3.7-337

~~SR 3.7.13.5~~

~~Operating the FBACS filter bypass damper is necessary to ensure that the system functions properly. The OPERABILITY of the FBACS filter bypass damper is verified if it can be closed. An [18] month Frequency is consistent with Reference 6.~~ CL3.7-177

REFERENCES

1. UFSAR, Section 7.5~~[6.5.1]~~.
2. UFSAR, Section 10.3~~[9.4.5]~~.
3. UFSAR, Section 14.5~~[15.7.4]~~.
4. Regulatory Guide 1.25.
5. NSP Prairie Island Safety Evaluation 50-475, "Spent Fuel Pool Personnel Access Doors," ~~10 CFR 100~~.

BASES (continued)

~~6. Regulatory Guide 1.52 (Rev. 2).~~

~~7. NUREG-0800, Section 6.5.1, Rev. 2, July 1981.~~

B 3.7 PLANT SYSTEMS

PA3.7-201

B 3.7.14~~8~~ Secondary Specific Activity

CL3.7-187

BASES

BACKGROUND

Activity in the secondary coolant results from steam generator tube outleakage from the Reactor Coolant System (RCS). Under steady state conditions, the activity is primarily iodines with relatively short half lives and, thus, indicates current conditions. During transients, I-131 spikes have been observed as well as increased releases of some noble gases. Other fission product isotopes, as well as activated corrosion products in lesser amounts, may also be found in the secondary coolant.

A limit on secondary coolant specific activity during power operation minimizes releases to the environment during ~~because of~~ normal operation, anticipated operational occurrences, and accidents.

This limit is lower than the activity value that might be expected from a 150 gpd~~gpm~~ tube leak (LCO 3.4.13~~3~~4, "RCS Operational LEAKAGE") of primary coolant at the limit of ~~[~~1.0~~]~~ μCi/gm (LCO 3.4.16~~7~~, "RCS Specific Activity"). The steam line failure is assumed to result in the release of the noble gas and iodine activity contained in the steam generator inventory, the feedwater, and the reactor coolant LEAKAGE. Most of the iodine isotopes have short half lives, (i.e., < 20 hours). ~~I-131, with a half life of 8.04 days, concentrates faster than it decays, but does not reach equilibrium because of blowdown and other losses.~~

TA3.7-341

~~With the specified activity limit, the resultant 2 hour thyroid dose to a person at the exclusion area boundary (EAB) would be~~

PA3.7-342

(continued)

CL3.7-187 PA3.7-201

BASES (continued)

~~about 0.58 rem if the main steam safety valves (MSSVs) open for 2 hours following a trip from full power.~~

~~Operating a unit at the allowable limits could result in a 2 hour EAB exposure of a small fraction of the 10 CFR 100 (Ref. 1) limits, or the limits established as the NRC staff approved licensing basis.~~ PA3.7-342

Limiting secondary specific activity also reduces site and exclusion area boundary (EAB) exposures in the event of a steam generator tube rupture (Ref. 1). PA3.7-342

APPLICABLE SAFETY ANALYSES

The accident analysis of the main steam line break (MSLB) outside of containment, as discussed in the UFSAR~~, Chapter [15]~~ (Ref. 1~~2~~) and NSP License Amendment Request correspondence (Ref. 2), assumes the initial secondary coolant specific activity to have a radioactive isotope concentration of ~~[~~0.10~~]~~ μCi/gm DOSE EQUIVALENT I-131. This assumption is used in the analysis for determining the radiological consequences of the postulated accident. The accident analysis, based on this and other assumptions, shows that the radiological consequences of a~~n~~ MSLB do not exceed a small fraction of the unit EAB limits of 10 CFR 100.11 for whole body and thyroid dose rates.

With the loss of offsite power, the remaining steam generator~~s~~ is~~are~~ available for core decay heat dissipation by venting steam to the atmosphere through the main steam safety valves (MSSVs) and steam generator power operated relief~~atmospheric dump~~ valves ~~(ADVs)~~ (SG PORV). The Auxiliary Feedwater System supplies the necessary makeup to the steam generators. Venting continues until the reactor coolant temperature and pressure have decreased sufficiently for the Residual Heat Removal System to complete the cooldown. PA3.7-247

(continued)

CL3.7-187 | PA3.7-201

BASES

In the evaluation of the radiological consequences of this accident, the activity released from the steam generator connected to the failed steam line is assumed to be released directly to the environment. The unaffected steam generator is assumed to discharge steam and any entrained activity through the MSSVs and SG PORV~~ADVs~~ during the event. Since no credit is taken in the analysis for activity plateout or retention, the resultant radiological consequences represent a conservative estimate of the potential integrated dose due to the postulated steam line failure.

With the specified activity limit, the resultant 2 hour thyroid dose to a person at the EAB would be a very small fraction of Reference 3 requirements if the MSSVs open for 2 hours following a trip from full power. PA3.7-342

Secondary specific activity limits satisfy Criterion 2 of 10 CFR 50.36(c)(2)(ii)~~the NRC Policy Statement~~.

LCO

As indicated in the Applicable Safety Analyses, the specific activity of the secondary coolant is required to be ≤ ~~[~~0.10~~]~~ μCi/gm DOSE EQUIVALENT I-131 to limit the radiological consequences of a Design Basis Accident (DBA) to a small fraction of the required limit (Ref. ~~1~~3).

Monitoring the specific activity of the secondary coolant ensures that when secondary specific activity limits are exceeded, appropriate actions are taken in a timely manner

(continued)

CL3.7-187 PA3.7-201

BASES

to place the unit in an operational MODE that would minimize the radiological consequences of a DBA.

APPLICABILITY

In MODES 1, 2, 3, and 4, the limits on secondary specific activity apply due to the potential for secondary steam releases to the atmosphere.

In MODES 5 and 6, the steam generators are not being used for heat removal. Both the RCS and steam generators are depressurized, and primary to secondary LEAKAGE is minimal. Therefore, monitoring of secondary specific activity is not required.

ACTIONS

A.1 and A.2

DOSE EQUIVALENT I-131 exceeding the allowable value in the secondary coolant, is an indication of a problem in the RCS and contributes to increased post accident doses. If the secondary specific activity cannot be restored to within limits within the associated Completion Time, 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 3.7.14.1

This SR verifies that the secondary specific activity is within the limits of the accident analysis. A gamma

(continued)

CL3.7-187 PA3.7-201

BASES

isotopic analysis of the secondary coolant, which determines DOSE EQUIVALENT I-131, confirms the validity of the safety analysis assumptions as to the source terms in post accident releases. It also serves to identify and trend any unusual isotopic concentrations that might indicate changes in reactor coolant activity or LEAKAGE.

The 31 day Frequency is based on the detection of increasing trends of the level of DOSE EQUIVALENT I-131, and allows for appropriate action to be taken to maintain levels below the LCO limit.

REFERENCES

1. ~~10 CFR 100.11.~~

~~2. UFSAR, Section 14.5[15].~~

2. Letter entitled "Response to Request for Additional Information Related to License Amendment Request Dated May 15, 1997 Incorporation of Voltage-Based Steam Generator Tube Repair Criteria (TAC Nos. M98944 and M98945)", Joel P. Sorensen (NSP) to US Nuclear Regulatory Commission, dated October 20, 1997.

3. 10 CFR 100.11.

(continued)

B 3.7 PLANT SYSTEMS

PA3.7-201

B 3.7.15 Spent Fuel Storage Pool Water Level

PA3.7-178

BASES

BACKGROUND

The minimum water level in the spent fuel storage pool meets the assumptions of iodine decontamination factors following a fuel handling accident. The specified water level shields and minimizes the general area dose when the storage racks are filled to their maximum capacity. The water also provides shielding during the movement of spent fuel.

A general description of the spent fuel storage pool design and a ~~is given in the FSAR, Section [9.1.2] (Ref. 1). A~~ description of the Spent Fuel Pool Cooling and Cleanup System is given in the UFSAR~~, Section [9.1.3]~~ (Ref. 1~~2~~). The assumptions of the fuel handling accident are given in ~~the FSAR, Section [15.7.4] (~~Reference~~.~~ 2~~3)~~.

APPLICABLE SAFETY ANALYSES

The minimum water level in the spent fuel storage pool meets the assumptions of the fuel handling accident described in Regulatory Guide 1.25 (Ref. 3~~4~~). The resultant 2 hour thyroid dose per person at the exclusion area boundary is a small fraction of the 10 CFR 100 11~~ (Ref. 5)~~ limits.

According to Reference 3~~4~~, there is 23 ft of water between the top of the damaged fuel bundle and the fuel pool surface during a fuel handling accident. With 23 ft of water, the assumptions of Reference 3~~4~~ can be used directly. In practice, this LCO preserves this assumption for the bulk of the fuel in the storage racks. In the case of a single bundle dropped and lying horizontally on top of the spent fuel racks, however, there may be < 23 ft of water above the top of the fuel bundle and the surface, indicated by the width of the bundle. To offset this small nonconservatism,

(continued)

PA3.7-178 PA3.7-201

BASES (continued)

the analysis assumes that all fuel rods fail, although analysis shows that only the first few rows fail from a hypothetical maximum drop. The Fuel Handling Accident is discussed in Reference 2.

The spent fuel storage pool water level satisfies Criteria ~~on~~ 2 and 3 of 10 CFR 50.36(c)(2)(ii) ~~the NRC Policy Statement~~. TA3.7-343

LCO

The spent fuel storage pool water level is required to be ≥ 23 ft over the top of irradiated fuel assemblies seated in the storage racks. The specified water level preserves the assumptions of the fuel handling accident analysis (Ref. 2~~3~~). As such, it is the minimum required for spent fuel ~~storage and~~ movement within the spent fuel storage pool.

APPLICABILITY

This LCO applies during movement of irradiated fuel assemblies in the spent fuel storage pool, since the potential for a release of fission products exists.

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that LCO 3.0.3 does not apply.

When the initial conditions for prevention of an accident cannot be met, steps should be taken to preclude the accident from occurring. When the spent fuel storage pool water level is lower than the required level, the movement of irradiated fuel assemblies in the spent fuel storage pool

(continued)

PA3.7-178 PA3.7-201

BASES

is immediately suspended ~~to a safe position~~. This action effectively precludes the occurrence of a fuel handling accident. This does not preclude movement of a fuel assembly to a safe position.

If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODES 1, 2, 3, and 4, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.7.15.1

This SR verifies sufficient spent fuel storage pool water is available in the event of a fuel handling accident. The water level in the spent fuel storage pool must be checked periodically. The 7 day Frequency is appropriate because

SURVEILLANCE REQUIREMENTS

~~SR 3.7.15.1 (continued)~~

the volume in the pool is normally stable. Water level changes are controlled by plant procedures and are acceptable based on operating experience.

During refueling operations, the level in the spent fuel storage pool is in equilibrium with the refueling cavity~~canal~~, and the level in the refueling cavity~~canal~~ is checked daily in accordance with SR 3.9.~~2~~6.1.

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BASES

REFERENCES

1. UFSAR, Section 10.2[9.1.2].
2. UFSAR, Section 14.5[9.1.3].
3. ~~FSAR, Section [15.7.4].~~
4. Regulatory Guide 1.25, [Rev. 0].
5. ~~10 CFR 100.11.~~

B 3.7 PLANT SYSTEMS

PA3.7-201

B 3.7.16 Spent Fuel Storage Pool Boron Concentration

PA3.7-178

BASES

CL3.7-344

BACKGROUND

~~In the Maximum Density Rack (MDR) [(Refs. 1 and 2)] design,~~ [the spent fuel storage pool is ~~divided into~~ two ~~separate and distinct regions~~ compartment pool as described in Reference 1 ~~which, for the purpose of criticality considerations, are considered as separate pools~~. These 2 compartments are referred to as Pool 1 and Pool 2. Pool~~[Region~~ 1~~], with~~ has up to 462~~[336]~~ storage positions~~, is designed to accommodate new fuel with a maximum enrichment of [4.65] wt% U-235, or spent fuel regardless of the discharge fuel burnup.~~ Pool~~[Region~~ 2~~], with~~ has up to 1120~~[2670]~~ storage positions~~,~~.

Either pool is designed to accommodate fuel of various initial enrichments (up to 5 weight percent (w/o)) which have accumulated minimum burnups and decay times within the ~~acceptable~~unrestricted domain according to the applicable Figure ~~[~~3.7.17-1~~]~~(OFA design) or Figure 3.7.17-2 (STD design), in the accompanying LCO. Fuel assemblies not meeting the criteria of the applicable Figure ~~[~~3.7.17-1~~]~~ or Figure 3.7.17-2 shall be stored in accordance with paragraph 4.3.1.1 in Technical Specifications Section 4.3, Fuel Storage.

CL3.7-346

The water in the spent fuel storage pool normally contains soluble boron, which results in large subcriticality margins under actual operating conditions. However, the NRC guidelines, based upon the accident condition in which all soluble poison is assumed to have been lost, specify that the limiting k_{eff} of 1.000~~0.95~~ be evaluated in the absence of soluble boron. ~~Hence, the design of both regions is based on the use of unborated water, which maintains each region in a subcritical condition during~~

CL3.7-344

PA3.7-201 PA3.7-178

BASES

~~normal operation with the regions fully loaded.~~ The double contingency principle discussed in ~~ANSI N-16.1-1975~~Reference 2 and the April 1978 NRC letter (Ref. 3) allows credit for additional soluble boron under other abnormal or accident conditions, since only a single accident need be considered at one time. ~~For example, the most severe accident scenario is associated with the movement of fuel from [Region 1 to Region 2], and accidental misloading of a fuel assembly in [Region 2]. This could potentially increase the criticality of [Region 2]. To mitigate these postulated criticality related accidents, boron is dissolved in the pool water.~~ Safe operation of the ~~MDR~~spent fuel pool ~~with no movement of assemblies~~ may therefore be achieved by controlling the location of each assembly in accordance with LCO 3.7.17, "Spent Fuel Pool~~Assembly~~ Storage~~.~~" and by maintaining boron concentration in accordance with this LCO. ~~Prior to movement of an assembly, it is necessary to perform SR 3.7.16.1.~~

CL3.7-344

TA3.7-194

CL3.7-189

APPLICABLE SAFETY ANALYSES

~~Most accident conditions do not result in an increase in the activity of either of the two regions. Examples of these accident conditions are the loss of cooling (reactivity increase with decreasing water density) and the dropping of a fuel assembly on the top of the rack. However, accidents can be postulated that could increase the reactivity. This increase in reactivity is unacceptable with unborated water in the storage pool. Thus, for these accident occurrences, the presence of soluble boron in the storage pool prevents criticality in both regions. The postulated accidents are basically of two types. A fuel assembly could be incorrectly transferred from [Region 1 to Region 2] (e.g., an unirradiated fuel assembly or an insufficiently depleted fuel assembly). The second type of postulated accidents is associated with a fuel assembly which is dropped adjacent to the fully loaded [Region 2] storage rack. This could have a small positive reactivity effect on [Region 2]. However, the negative reactivity~~

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PA3.7-201 PA3.7-178

BASES

~~effect of the soluble boron compensates for the increased reactivity caused by either one of the two postulated accident scenarios. The accident analyses is provided in the FSAR, Section [15.7.4] (Ref. 4).~~

Most accident conditions in the spent fuel pool will not result in an increase in K_{eff} of the racks. Examples of those accident conditions which will not result in an increase in K_{eff} are a fuel assembly drop on the top of the racks, a fuel assembly drop between rack modules and wall (rack design precludes this condition), and a drop on placement of a fuel assembly into the cask loading area of the small pool. However, two accidents can be postulated which could increase reactivity. The first postulated accident would be a loss of the spent fuel pool cooling system and the second would be a misload of a fuel assembly into a cell for which the restrictions on location, enrichment, burnup, decay time or gadolinium credit are not satisfied. For an occurrence of these postulated accident conditions, the double contingency principle of Reference 2 can be applied. This states that one is not required to assume two unlikely, independent, concurrent events to ensure protection against a criticality accident. Thus, for these postulated accident conditions, the presence of additional soluble boron in the spent fuel pool water (above the 750 ppm required to maintain K_{eff} less than 0.95 under normal conditions) can be assumed as a realistic initial condition since not assuming its presence would be a second unlikely event. CL3.7-347

Calculations were performed (Ref. 4) to determine the amount of soluble boron required to offset the highest reactivity increase caused by either of these postulated accidents and to maintain K_{eff} less than or equal to 0.95. It was found that a spent fuel pool boron concentration of 1300 ppm was adequate to mitigate these postulated criticality related accidents and to maintain K_{eff} less than or equal to 0.95. This specification ensures the spent fuel pool contains adequate dissolved boron to compensate CL3.7-347

PA3.7-201 PA3.7-178

BASES

for the increased reactivity caused by a mispositioned fuel assembly or a loss of spent fuel pool cooling. The 1800 ppm spent fuel pool boron concentration limit in this specification was chosen to be consistent with the boron concentration limit required for a spent fuel cask containing fuel. The 1800 ppm limit will ensure that K_{eff} for the spent fuel cask, including statistical probabilities, will be less than or equal to 0.95 for all postulated arrangements of fuel within the cask.

Technical Specifications Section 4.3 requires that the spent fuel rack K_{eff} be less than or equal to 0.95 when flooded with water borated to 750 ppm. A spent fuel pool boron dilution analysis was performed which confirmed that sufficient time is available to detect and mitigate a dilution of the spent fuel pool before the 0.95 K_{eff} design basis is exceeded. The spent fuel pool boron dilution analysis concluded that an unplanned or inadvertent event which could result in the dilution of the spent fuel pool boron concentration from 1800 ppm to 750 ppm is not a credible event. CL3.7-347

The concentration of dissolved boron in the fuel storage pool satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii) ~~the NRC Policy Statement~~.

LCO

The fuel storage pool boron concentration is required to be ≥ 1800 ~~[2300]~~ ppm. The specified concentration of dissolved boron in the fuel storage pool preserves the assumptions used in the analyses of the potential critical accident scenarios as described in References 4 and 5. This concentration of dissolved boron is the minimum required concentration for fuel assembly storage, ~~and~~ movement within the fuel storage pool, and for loading and unloading a spent fuel storage cask. PA3.7-188 CL3.7-351

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BASES

BASES

APPLICABILITY

This LCO applies whenever fuel assemblies are stored in the spent fuel storage pool~~, until a complete spent fuel storage pool verification has been performed following the last movement of fuel assemblies in the spent fuel storage pool~~. CL3.7-189

~~This LCO does not apply following the verification, since the verification would confirm that there are no misloaded fuel assemblies. With no further fuel assembly movements in progress, there is no potential for a misloaded fuel assembly or a dropped fuel assembly.~~

~~APPLICABILITY (continued)~~

ACTIONS

A.1~~, A.2.1,~~ and A.2~~.2~~

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

When the concentration of boron in the spent fuel storage pool is less than required, immediate action must be taken to preclude the occurrence of an accident or to mitigate the consequences of an accident in progress. This is most efficiently achieved by immediately suspending the movement of fuel assemblies. The concentration of boron is restored simultaneously with suspending movement of fuel assemblies. ~~An acceptable alternative is to verify by administrative means that the fuel storage pool verification has been performed since the last movement of fuel assemblies in the fuel storage pool. However, prior to resuming movement of fuel assemblies, the concentration of boron must be restored.~~ This does not preclude movement of a fuel assembly to a safe position. CL3.7-189

If the LCO is not met while moving irradiated fuel assemblies in MODE 5 or 6, LCO 3.0.3 would not be applicable. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operation. Therefore, inability to suspend movement

(continued)

PA3.7-201 PA3.7-178

BASES
~~BASES (continued)~~

of fuel assemblies is not sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.7.16.1

This SR verifies that the concentration of boron in the spent fuel storage pool is within the required limit. As long as this SR is met, the analyzed accidents are fully addressed. The 7 day Frequency is appropriate because no major replenishment of pool water is expected to take place over such a short period of time.

REFERENCES

1. USAR, Section 10.2 ~~Callaway FSAR, Appendix 9.1A, "The Maximum Density Rack (MDR) Design Concept."~~

2. ANSI/ANS-8.1-1983 ~~Description and Evaluation for Proposed Changes to Facility Operating Licenses DPR-39 and DPR-48 (Zion Power Station)~~.

3. Nuclear Regulatory Commission, Letter to All Power Reactor Licensees from B. K. Grimes, "OT Position for Review and Acceptance of Spent Fuel Storage and Handling Applications", April 14, 1978. ~~Double contingency principle of ANSI N16.1-1975, as specified in the April 14, 1978 NRC letter (Section 1.2) and implied in the proposed revision to Regulatory Guide 1.13 (Section 1.4, Appendix A).~~

4. "Northern States Power Prairie Island Units 1 and 2, Spent Fuel Rack Criticality Analysis Using Soluble Boron Credit", Westinghouse Commercial Nuclear Fuel Division, February 1997 ~~FSAR, Section [15.7.4]~~.

5. USAR, Section 14.5.

(continued)

B 3.7 PLANT SYSTEMS

TA3.7-194 PA3.7-201 CL3.7-191

B 3.7.17 Spent Fuel Pool~~Assembly~~ Storage

BASES

BACKGROUND

~~In the Maximum Density Rack (MDR) [(Refs. 1 and 2)] design,~~ [the] spent fuel storage pool is a~~divided into~~ two ~~separate and distinct regions~~ compartment pool as described in the USAR (Ref. 1) ~~which, for the purpose of criticality considerations, are considered as separate pools~~. These 2 compartments are referred to as Pool 1 and Pool 2. Fuel stored in the Prairie Island fuel storage pools include fuel with the:

CL3.7-344

a. OFA designation, which includes the Westinghouse OFA and Vantage Plus designs; and

b. STD designation, which includes the Westinghouse Standard and Exxon fuel designs.

Criticality considerations provide the primary basis for storage limitations.

Pool 1 may contain up to 462 storage positions, except when the pool is used for cask laydown. In the latter case, only 266 storage positions are available since 4 storage racks must be removed to accommodate the storage cask. Pool 2 has up to 1120 storage positions.

~~[Region~~Pools 1 and 2~~], with [336] storage positions,~~ ~~is~~ are designed to accommodate ~~new fuel with a maximum enrichment of [4.65] wt% U-235, or spent fuel regardless of the discharge fuel burnup.~~ fuel of various initial enrichments (up to 5 weight percent (w/o)), which have accumulated minimum burnups and decay times within the unrestricted ~~acceptable~~ domain according to the applicable

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BASES

Figure 3.7.17-1 (OFA Fuel) or Figure 3.7.17-2 (STD Fuel), in the accompanying LCO.

~~[Region 2], with [2670] storage positions, is designed to accommodate fuel of various initial enrichments which have accumulated minimum burnups within the acceptable domain according to Figure 3.7.17-1, in the accompanying LCO.~~ Fuel assemblies not meeting the criteria of the applicable Figure ~~[~~3.7.17-1~~]~~ or Figure 3.7.17-2~~,~~ shall be stored in accordance with paragraph 4.3.1.1 in Section 4.3, Fuel Storage.

The water in the spent fuel storage pool normally contains soluble boron, which results in large subcriticality margins under actual operating conditions. However, the NRC guidelines, based upon the accident condition in which all soluble poison is assumed to have been lost, specify that the limiting k_{eff} of 1.00~~0.95~~ be evaluated in the absence of soluble boron. ~~Hence, the design of both regions is based on the use of unborated water, which maintains each region in a subcritical condition during normal operation with the regions fully loaded.~~ The double contingency principle discussed in ~~ANSI N-16.1-1975~~Reference 2 and the April 1978 NRC letter (Ref. 3) allows credit for additional soluble boron under other abnormal or accident conditions, since only a single accident need be considered at one time. ~~For example, the most severe accident scenario is associated with the movement of fuel from [Region 1 to Region 2], and accidental misloading of a fuel assembly in [Region 2]. This could potentially increase the criticality of [Region 2].~~ To mitigate ~~these~~ postulated criticality related accidents, boron is dissolved in the pool water. Safe operation of the ~~MDR~~spent fuel pool ~~with no movement of assemblies~~ may therefore be achieved by controlling the location of each assembly in accordance with the accompanying LCO and maintaining boron concentration in accordance with LCO 3.7.16. ~~Prior to movement of an assembly, it is necessary to perform SR 3.7.16.1.~~

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BASES (continued)

APPLICABLE SAFETY ANALYSES

The hypothetical criticality accidents can only take place during or as a result of the movement of an assembly (Ref. 4). For these accident occurrences, the presence of soluble boron in the spent fuel storage pool (controlled by LCO 3.7.16, "Fuel Storage Pool Boron Concentration") prevents criticality~~ in both regions~~. By closely controlling the movement of each assembly and by verifying the appropriate checkerboarding~~checking the location of each assembly~~ after each fuel handling campaign~~movement~~, the time period for potential accidents may be limited to a small fraction of the total operating time. During the remaining time period with no potential for criticality accidents, the operation may be under the auspices of the accompanying LCO.

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The spent fuel storage racks have been analyzed in accordance with the methodology contained in Reference 5. That methodology ensures that the spent fuel rack multiplication factor, K_{eff}, is less than 0.95 as recommended by ANSI 57.2-1983 (Ref. 6) and NRC guidance (Ref. 3). The codes, methods and techniques contained in the methodology are used to satisfy this criterion on K_{eff}. The resulting Prairie Island spent fuel rack criticality analysis allows for the storage of fuel assemblies with enrichments up to a maximum of 5.0 weight percent U-235 while maintaining $K_{eff} \leq 0.95$ including uncertainties and credit for soluble boron. In addition, sub-criticality of the pool ($K_{eff} < 1.0$) is assured on a 95/95 basis, without the presence of the soluble boron in the pool. Credit is taken for radioactive decay time of the spent fuel and for the presence of fuel rods containing gadolinium burnable poison.

The criticality analysis (Ref. 7) utilized the following storage configurations to ensure that the spent fuel

(continued)

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BASES (continued)

pool will remain subcritical during the storage of fuel assemblies with all possible combinations of burnup and initial enrichment.

a. The first storage configuration utilizes a checkerboard loading pattern to accommodate new or low burnup fuel with a maximum enrichment of 5.0 w/o U-235. This configuration stores "burned" and "fresh" fuel assemblies in a 3x3 checkerboard pattern as shown in Figure 4.3-1. Fuel assemblies stored in "burned" cell locations are selected based on a combination of fuel assembly type, initial enrichment, discharge burnup and decay time (Figures 4.3-3 through 4.3-12). The criteria for the fuel stored in the "burned" locations is also dependent on the number of rods containing gadolinium in the center "fresh" fuel assembly. The use of empty cells is also an acceptable option for the "burned" cell locations. This will allow the storage of new or low burnup fuel assemblies in the outer rows of the spent fuel storage racks because the area outside the racks can be considered to be empty cells.

Fuel assemblies that fall into the restricted range of Figures 3.7.17-1 or 3.7.17-2 are required to be stored in "fresh" cell locations as shown in Figure 4.3-1. The criteria included in Figures 3.7.17-1 and 3.7.17-2 for the selection of fuel assemblies to be stored in the "fresh" cell locations is based on a combination of fuel assembly type, initial enrichment, decay time and discharge burnup.

b. The second storage configuration does not utilize any special loading pattern. Fuel assemblies with burnup, initial enrichment and decay time which fall into the unrestricted range of Figures 3.7.17-1 or 3.7.17-2, as applicable, can be stored anywhere in the region with no special placement CL3.7-347

(continued)

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BASES (continued)

restrictions.

The burned/fresh fuel checkerboard region can be positioned anywhere within the spent fuel racks, but the boundary between the checkerboard region and the unrestricted region must be either:

a. Separated by a vacant row of cells; or

b. The interface must be configured such that there is one row carryover of the pattern of burned assemblies from the checkerboard region into the first row of the unrestricted region (Figure 4.3-2).

Specification 3.7.17 and Section 4.3 ensure that fuel is stored in the spent fuel racks in accordance with the storage configurations assumed in the spent fuel rack criticality analysis (Ref. 7).

The spent fuel pool criticality analysis addresses all the fuel types currently stored in the spent fuel pool and in use in the reactor. The fuel types considered in the analysis include the Westinghouse Standard (STD), OFA, and Vantage Plus designs, and the Exxon fuel assembly types in storage in the spent fuel pool. The OFA designation on the figures in Specification 3.7.17 and Section 4.3 bound all of the Westinghouse OFA and Vantage Plus fuel assemblies at Prairie Island. The STD designation on the figures in Specification 3.7.17 and Section 4.3 bound all of the Westinghouse STD and Exxon fuel assemblies at Prairie Island. CL3.7-347

Most accident conditions in the spent fuel pool will not result in an increase in K_{eff} of the racks. Examples of those accident conditions which will not result in an increase in K_{eff} are:

a. A fuel assembly drop on the top of the racks;

(continued)

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BASES (continued)

b. A fuel assembly drop between rack modules and wall (rack design precludes this condition); and

c. A drop or placement of a fuel assembly into the cask loading area of the small pool.

However, two accidents can be postulated which could increase reactivity. The first postulated accident would be a loss of the spent fuel pool cooling system and the second would be a misload of a fuel assembly into a cell for which the restrictions on location, enrichment, burnup, decay time or gadolinium credit are not satisfied.

For an occurrence of these postulated accident conditions, the double contingency principle of Reference 2 can be applied. This states that one is not required to assume two unlikely, independent, concurrent events to ensure protection against a criticality accident. Thus, for these postulated accident conditions, the presence of additional soluble boron in the spent fuel pool water (above the 750 ppm required to maintain K_{eff} less than 0.95 under normal conditions) can be assumed as a realistic initial condition since not assuming its presence would be a second unlikely event.

Westinghouse Commercial Nuclear Fuel Division calculations (Ref. 7) were performed to determine the amount of soluble boron required to offset the highest reactivity increase caused by either of these postulated accidents and to maintain K_{eff} less than or equal to 0.95. It was found that a spent fuel pool boron concentration of 1300 ppm was adequate to mitigate these postulated criticality related accidents and to maintain K_{eff} less than or equal to 0.95. CL3.7-347

Specification 3.7.16 ensures the spent fuel pool contains adequate dissolved boron to compensate for the increased reactivity caused by a mispositioned fuel assembly or a loss of

(continued)

CL3.7-191 TA3.7-194 PA3.7-201

BASES (continued)

spent fuel pool cooling. The 1800 ppm spent fuel pool boron concentration limit in Specification 3.7.16 is consistent with the boron concentration limit required for a spent fuel cask containing fuel.

Section 4.3 requires that the spent fuel rack K_{eff} be less than or equal to 0.95 when flooded with water borated to 750 ppm. A spent fuel pool boron dilution analysis was performed which confirmed that sufficient time is available to detect and mitigate a dilution of the spent fuel pool before the 0.95 K_{eff} design basis is exceeded. The spent fuel pool boron dilution analysis concluded that an unplanned or inadvertent event which could result in the dilution of the spent fuel pool boron concentration from 1800 ppm to 750 ppm is not a credible event.

When the requirements of Specification 3.7.17 are not met, immediate action must be taken to move any noncomplying fuel assembly to an acceptable location to preserve the double contingency principle assumption of the criticality accident analysis.

The configuration of fuel assemblies in the fuel storage pool satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii)~~the NRC Policy Statement~~.

LCO

The restrictions on the placement of fuel assemblies within the spent fuel pool, in accordance with the applicable Figure 3.7.17-1 (OFA Fuel) or Figure 3.7.17-2 (STD Fuel), in the accompanying LCO, ensure~~s~~ the k_{eff} of the spent fuel storage pool will always remain < 0.95, ~~assuming the pool to be flooded with unborated water~~with credit given for boron in the water. CL3.7-346

Fuel assemblies not meeting the criteria of the appropriate Figure ~~(~~3.7.17-1~~)~~ or Figure 3.7.17-2 shall be stored in accordance with Specification 4.3.1.1 in Section 4.3.

(continued)

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BASES

APPLICABILITY

This LCO applies whenever any fuel assembly is stored in ~~[Region 2] of~~ the spent fuel storage pool.

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that LCO 3.0.3 does not apply.

When the configuration of fuel assemblies stored in ~~[Region 2]~~ the spent fuel storage pool is not in accordance with the applicable Figure 3.7.17-1 on Figure 3.7.17-2, or paragraph 4.3.1.1, the immediate action is to initiate action to make the necessary fuel assembly movement(s) to bring the configuration into compliance with the applicable Figure 3.7.17-1 or Figure 3.7.17-2 or Specification 4.3.1.1. CL3.7-346

ACTIONS

~~A.1 (continued)~~

If unable to move irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not be applicable. If unable to move irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the action is independent of reactor operation. Therefore, inability to move fuel assemblies is not sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.7.17.1

This SR verifies by administrative means that the initial enrichment and burnup of the fuel assembly is in accordance with the applicable Figure ~~[~~3.7.17-1~~]~~ or Figure 3.7.17-2 in the accompanying LCO. For fuel assemblies in the restricted~~unacceptable~~ range of the applicable Figure 3.7.17-1 or Figure 3.7.17-2, performance of this SR will ensure compliance with Specification 4.3.1.1. CL3.7-346

The Frequency of this SR is prior to storing or moving a fuel

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BASES

assembly.

SR 3.7.17.2

This SR verifies that the fuel assemblies in the spent fuel storage racks are stored in accordance with the requirements of LCO 3.7.17 and Section 4.3.1.1. CL3.7-190

The intent of this SR is to not require completion of the spent fuel pool inventory verification during interruptions in fuel handling during a defined fuel handling campaign. No spent fuel pool inventory verification is required following fuel movements where no fuel assemblies are relocated to different spent fuel rack locations.

The Frequency of this SR requires performance within 7 days after the completion of any fuel handling campaign which involves: CL3.7-190

a. The relocation of fuel assemblies within the spent fuel pool; or

b. The addition of fuel assemblies to the spent fuel pool.

The extent of a fuel handling campaign will be defined by plant administrative procedures. Examples of a fuel handling campaign would include all the fuel handling performed during a refueling outage or associated with the placement of new fuel into the spent fuel pool.

The 7 day allowance for completion of this SR provides adequate time for completion of the spent fuel pool inventory verification while minimizing the time a fuel assembly may be misloaded in the spent fuel pool. If a fuel assembly is misloaded during the fuel handling campaign, the minimum boron concentration required by LCO 3.7.16 will ensure that the spent fuel rack K_{eff} remains within limits until the spent fuel inventory verification is performed.

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BASES

REFERENCES

~~1. Callaway FSAR, Appendix 9.1A, "The Maximum Density Rack (MDR) Design Concept."~~ PA3.7-352

~~2. Description and Evaluation for Proposed Changes to Facility Operating Licenses DPR-39 and DPR-48 (Zion Power Station).~~

~~3. Double contingency principle of ANSI N16.1-1975, as specified in the April 14, 1978 NRC letter (Section 1.2) and implied in the proposed revision to Regulatory Guide 1.13 (Section 1.4, Appendix A).~~

~~4. FSAR, Section [15.7.4].~~

1. USAR, Section 10.2.

2. ANSI/ANS-8.1-1983.

3. Nuclear Regulatory Commission, Letter to All Power Reactor Licensees from B. K. Grimes, "OT Position for Review and Acceptance of Spent Fuel Storage and Handling Applications", April 14, 1978.

4. "Criticality Analysis of the Prairie Island Units 1 & 2 Fresh and Spent Fuel Racks", Westinghouse Commercial Nuclear Fuel Division, Februany 1993.

5. WCAP-14416-NP-A, "Westinghouse Spent Fuel Rack Criticality Analysis Methodology", Revision 1, November 1996.

6. American Nuclear Society, "American National Standard Design Requirements for Light Water Reactor Fuel Storage Facilities at Nuclear Power Plants", ANSI/ANS-57.2-1983, October 7, 1983.

7. "Northern States Power Prairie Island Units 1 and 2 Spent Fuel Rack Criticality Analysis Using Soluble Boron Credit", Westinghouse Commercial Nuclear Fuel Division, February 1997.