July 7, 2010

Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application

Part 4

Technical Specifications Revision 1

Update Tracking Report

Revision 1

Revision History

Revision	Date	Update Description
-	11/20/2009	COLA Revision 1 Transmittal See Luminant Letter no. TXNB-09074 Date 11/20/2009
-	11/11/2009	Updated Chapters: Introduction, Specifications, Bases See Luminant Letter no. TXNB-09064 Date 11/11/2009 Incorporated responses to following RAIs: No. 90, 91
-	12/16/2009	Updated Chapters: Specifications, Bases See Luminant Letter no. TXNB-09081 Date 12/16/2009 Incorporated responses to following RAIs: No. 121
0	1/8/2010	Updated Chapters: Introduction, Specifications, Bases
-	4/5/2010	Updated Chapters: Specifications, Bases See Luminant Letter no. TXNB-10028 Date 4/5/2010 Incorporated responses to following RAIs: No. 149
1	7/7/2010	Updated Chapters: Specifications, Bases

Introduction

Introduction – Tracking Report Revision List

Change ID No.	Section	TS Rev 1 Page*	Reason for change	Change Summary	Rev. of T/R
RCOL2_16-16	Section A	1, 2, 3, 5	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Deleted COL Items CP COL 16.1_3.3.1 (1), CP COL 16.1_3.3.2(1), CP COL 16.1_3.3.5(1), and CP COL 16.1_3.3.6(1).	-
RCOL2_16-15	Section A	6	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Added the additional justification for CP COL 16.1_3.3.5 (1).	-
RCOL2_16-16	Section A	14, 15	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Added CP COL 16.1_5.5.21 (1) "Setpoint Control Program Methodology and Implementation", replaced "CP SUP 16.1_5.5.21 (1)" with "CP SUP 16.1_5.5.22 (1)", and replaced referred section 5.5.21 with 5.5.22.	-
MAP-16-201	Section A	6, 13, 16	Consistency with DCD Rev.2 Incorporate editorial relevant changes from Chapter 16 of DCD Revision 2	Deleted CP COL 16.1_3.4.17(1), CP COL 16.1_5.5.9(1), CP COL 16.1_5.6.7(1),	0

*Page numbers for the attached marked-up pages may differ from the revision 1 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

Specifications

Specifications – Tracking Report Revision List

Change ID No.	Section	TS Rev 1 Page*	Reason for change	Change Summary	Rev. of T/R
RCOL4_16-8	3.7.9	3.7.9-1	Response to RAI No. 90 Luminant Letter no.TXNB-09064 Date 11/11/2009	Revised Completion Time of condition A to 72 hours.	-
RCOL4_16-4	3.7.9	3.7.9-1 3.7.9-2	Response to RAI No. 90 Luminant Letter no.TXNB-09064 Date 11/11/2009	Condition B was divided into Condition B and new Condition C to address basin temperature and water level, respectively. Each Completion Time was revised respectively. In addition, the explanation of Condition B and new Condition C has been changed from "One or more UHS basins with …" to "One or more required UHS basins with …" Following Condition IDs were moved up due to new Condition C.	-
RCOL4_16-1	3.7.9	3.7.9-2	Response to RAI No. 90 Luminant Letter no.TXNB-09064 Date 11/11/2009	Surveillance Requirement 3.7.9.5 was changed to verify start on manual actuation of each UHS transfer pump.	-
RCOL4_16-7	3.7.9	3.7.9-2	Response to RAI No. 90 Luminant Letter no.TXNB-09064 Date 11/11/2009	Frequency of SR 3.7.9.5 was revised to "In accordance with the Surveillance Frequency Control Program".	-
RCOL4_16-5	3.7.9	3.7.9-2	Response to RAI No. 90 Luminant Letter no.TXNB-09064 Date 11/11/2009	SR 3.7.9.6 and SR 3.7.9.7 were newly added. The bases were also newly added.	-
RCOL4_16-9	4.1	4.0-1	Response to RAI No. 90 Luminant Letter no.TXNB-09064 Date 11/11/2009	The description of site location was revised to be consistent with FSAR subsection 2.1.1.1.	-
RCOL2_16-12	3.3.1	3.3.1-20 3.3.1-21	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Corrected the following editorial and reference errors in Note 1 and 2: 1. Overtemperature ΔT incorrectly specifies T and T' instead of T_{avg} and T_{avg0}, respectively. 2. Overpower ΔT incorrectly specifies T and T" instead of T_{avg} and T_{avg0}, respectively.	-

Change ID No.	Section	TS Rev 1 Page*	Reason for change	Change Summary	Rev. of T/R
RCOL2_16-16	1.1	1.1-2	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Added description about Channel Calibration.	-
RCOL2_16-16	3.1.9	3.1.9-3	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Replaced “Table 3.3.1.1” with “Setpoint Control Program (SCP)”	-
RCOL2_16-16	3.3.1	3.3.1-13 through 3.3.1-18	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Deleted “Allowance Values”, “Trip Setpoint” and associated notes	-
RCOL2_16-16	3.3.1	3.3.1-19	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Deleted “Allowance Value…[±9.4]% RTP (Core Exit Boiling Limit)”	-
RCOL2_16-16	3.3.1	3.3.1-21	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Deleted “The Overpower…[±5.6]% RTP”	-
RCOL2_16-16	3.3.2	3.3.2-12 through 22	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Deleted “Allowance Values” and “Trip Setpoint” and associated notes	-
RCOL2_16-16	3.3.5	3.3.5-2	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Replaced “with Nominal Trip Setpoint and Allowance Value as follows” with “in accordance with the SCP with the following time delay” Deleted allowable value, setpoint and associated note.	-
RCOL2_16-16	3.3.6	3.3.6-4 through 3.3.6-5	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Deleted “Allowance Values” and “Trip Setpoint” and associated notes	-

Change ID No.	Section	TS Rev 1 Page*	Reason for change	Change Summary	Rev. of T/R
RCOL2_16-16	5.5	5.5-20 through 5.5-22	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Added new Subsection 5.5.21 Setpoint Control Program (SCP)	-
RCOL2_16-16	5.5	5.5-22	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Replaced “5.5.21” with “5.5.22”	-
RCOL2_09.02.05-05	3.7.9	3.7.9-2	Response to RAI No. 121 Luminant Letter No. TXNB-09081 Date 12/16/2009	Revised surveillance requirement SR 3.7.9.1 and description for LCO to change the water level from 2,850,000 gallons to 2,800,000 gallons.	-
RCOL2_09.02.05-14	3.7.9	3.7.9-2	Response to RAI No. 121 Luminant Letter No. TXNB-09081 Date 12/16/2009	Revised water temperature for Surveillance Requirement SR 3.7.9.2 from 95 to 93 degrees F.	-
-	-	-	Consistency with DCD Rev.2 Incorporate editorial relevant changes from Chapter 16 of DCD Revision 2	Incorporate changes as describe in MHI Letter DCD Revision 2 # UAP-HF-09490 dated 10/27/2009	0
RCOL2_16-18	3.7.9	3.7.9-2	Response to RAI No. 149 Luminant Letter no.TXNB-10028 Date 4/5/2010	Reverted the surveillance frequency change for SR 3.7.9.5, which was made in Response to RAI No. 90 (RCOL2_16-7).	-
DCD_16-300	1.1	1.1-2 [1.1-3]	Reflect response to DCD RAI No. 520	Revised sentence to correct typographical error.	1
DCD_16-300	3.3.1	3.3.1-8	Reflect response to DCD RAI No. 520	Revised required action for condition T of RTS instrumentation.	1
MAP-16-202	3.3.3	3.3.3-4 3.3.3-5	Reflect responses to DCD Draft Open Items 16.4.6	Revised table regarding Post Accident Monitoring Instrumentation.	1

Change ID No.	Section	TS Rev 1 Page*	Reason for change	Change Summary	Rev. of T/R
MAP-16-203	3.5.2	3.5.2-2	Reflect responses to DCD Draft Open Items 16.4.8	Added description about valves SIS-MOV-024A,B,C and D in SR 3.5.2.1	1
MAP-16-204	3.5.2	3.5.2-2	Reflect responses to DCD Draft Open Items 16.4.8	Incorporated surveillance requirement to verify the operability of ECCS valves which are manually activated during a design basis accident event.	1
CTS-01133	3.7.9	3.7.9-2	Erratum	Replaced “Condition A, B, or C …” with “Condition A, B, C, or D …” in description regarding CONDITION E.	1
MAP-16-205	3.8.1	3.8.1-1 3.8.1-2	Reflect responses to DCD Draft Open Items 16.4.11	Incorporated required action A.2	1

*Page numbers for the attached marked-up pages may differ from the revision 1 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

CHANNEL CALIBRATION

A CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel output such that it responds within the necessary range and accuracy to known values of the parameter that the channel monitors. The CHANNEL CALIBRATION shall encompass all devices in the channel required for channel OPERABILITY. CHANNEL CALIBRATION encompasses devices that are subject to drift between surveillance intervals and all input devices that are not tested through continuous automated self-testing. Refer to TADOT for output devices that are not tested through continuous automated self-testing.

The performance of a CHANNEL CALIBRATION shall be consistent with specification 5.5.2.1, "Setpoint Control Program" (SCP). RCOL2_16-16

For analog measurements on each Technical Specification required automatic protection instrumentation function implemented with a digital bistable function, CHANNEL CALIBRATION confirms the accuracy of the channel from sensor to digital Visual Display Unit (VDU) readout, as described in Topical Report, "Safety I&C System Description and Design Process," MUAP-07004 Section 4.4.2. CHANNEL CALIBRATION confirms the analog measurement accuracy at five calibration ~~setpoints~~settings corresponding to 0%, 25%, 50%, 75% and 100% of the instrument range. The confirmed ~~setpoint~~set points are monitored on the safety VDUs. RCOL2_16-16 DCD_16-300

For analog measurements on each Technical Specification required automatic protection instrumentation function implemented with analog bistable function, the CHANNEL CALIBRATION confirms the accuracy of the channel from sensor to output device. For these channels, CHANNEL CALIBRATION confirms the analog measurement accuracy at the Nominal Trip Setpoint (NTSP). RCOL2_16-16

For binary measurements, the CHANNEL CALIBRATION confirms the accuracy of the channel's state change, as described in Topical Report, "Safety I&C System Description and Design Process," MUAP-07004 Section 4.4.1.

Calibration of instrument channels with resistance temperature detector (RTD) or thermocouple sensors may consist of an inplace qualitative assessment of sensor behavior and normal calibration of the remaining adjustable devices in the channel. The CHANNEL CALIBRATION may be performed by means of any series of sequential, overlapping, or total channel steps.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
S. Required Action and associated Completion Time for Condition N, Q, or R not met.	S.1 Be in MODE 3.	6 hours
T. Main Turbine Stop Valve Position channel inoperable	----------NOTE---------- One channel may be bypassed for up to 12 hours for surveillance testing. ----------	
	T.1 Place channel in trip.	12 hours
	OR	DCD_16-300
	T.2 Reduce thermal power to < P-7	18 hours

SURVEILLANCE REQUIREMENTS

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

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2	----------NOTE---------- 1. Not required to be performed until 12 hours after THERMAL POWER is ≥ 15% RTP. ---------- Compare results of calorimetric heat balance calculation to power range channel output. Adjust power range channel output if calorimetric heat balance calculations results exceed power range channel output by more than +2% RTP.	In accordance with the Surveillance Frequency Control Program

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

FUNCTION	REQUIRED CHANNELS	CONDITION REFERENCED FROM REQUIRED ACTION D.1	
1.Wide Range Neutron Flux	2	E	
2.Reactor Coolant System (RCS) Hot Leg Temperature (Wide Range)	1 per loop [(d)]	~~F~~E	MAP-16-202
3.RCS Cold Leg Temperature (Wide Range)	1 per loop[(d)]	~~F~~E	MAP-16-202
4.RCS Pressure (Wide Range)	2	E	
5.Reactor Vessel Water Level	2	F	
6.Containment Pressure	2	E	
7.Containment Isolation Valve Position	2 per penetration flow path[(a)(b)]	E	
8.Containment High Range Area Radiation	2	F	
9.Pressurizer Water Level	2	E	
10.Steam Generator Water Level (Wide Range)	1 per steam generator[(d)]	~~F~~E	MAP-16-202
11.Steam Generator Water Level (Narrow Range)	2 per steam generator	E	
12.Core Exit Temperature - Quadrant 1	2[(c)]	E	
13.Core Exit Temperature - Quadrant 2	2[(c)]	E	
14.Core Exit Temperature - Quadrant 3	2[(c)]	E	
15.Core Exit Temperature - Quadrant 4	2[(c)]	E	
16.Emergency Feedwater Flow	1 per SG[(d)]	~~F~~E	MAP-16-202
17.Degrees of Subcooling	2	E	
18.Main Steam Line Pressure	2 per steam generator	E	
19.Emergency Feedwater Pit Level	2	E	
20.Refueling Water Storage Pit Level (Wide Range)	2	E	
21.Refueling Water Storage Pit Level (Narrow Range)	2	E	

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

(b) Only one position indication channel is required for penetration flow paths with only one installed control room indication channel.

(c) A channel consists of two core exit thermocouples.

(d) ~~A~~ RCS hot leg temperature wide range and a RCS cold leg temperature wide range of the same ~~train~~loop are pair PAM functions. ~~A~~Similarly, SG water level wide range and an emergency feedwater flow of the same ~~train~~steam generator are pair PAM functions. ~~The idea is to treat~~Either parameter~~s~~ forming a pair ~~as one set and choose the number of required channels to be two, providing a basis for control~~can fulfill all PAM Requirements. Therefore, only 1 per loop/SG of either parameter of the pair is required. MAP-16-202

SURVEILLANCE REQUIREMENTS

SURVEILLANCE			FREQUENCY
SR 3.5.2.1	Verify the following valves are in the listed position (with power to the valve operator removed).		In accordance with the Surveillance Frequency Control Program
Number	Function	Position	
SIS-AOV-201B and C	Accumulator Makeup	CLOSED	
SIS-MOV-024A, B, C and D	Safety Injection Pump Full-Flow Test Line Stop	CLOSED	MAP-16-203
SR 3.5.2.2	Verify each SIS manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.		In accordance with the Surveillance Frequency Control Program
SR 3.5.2.3	Verify each SI pump's developed head at the test flow point is greater than or equal to the required developed head.		In accordance with the Inservice Testing Program
SR 3.5.2.4	Verify each ECCS valve manually activated during a design basis accident event in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position.		In accordance with the Inservice Testing Program MAP-16-204
SR 3.5.2.~~4~~5	Verify each SI pump starts automatically on an actual or simulated actuation signal.		In accordance with the Surveillance Frequency Control Program MAP-16-204
SR 3.5.2.~~5~~6	Verify by visual inspection, each SIS train ECC/CS STRAINER is not restricted by debris and shows no evidence of structural distress or abnormal corrosion.		In accordance with the Surveillance Frequency Control Program MAP-16-204

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME	
~~D~~E. Required Action and associated Completion Time of Condition A, B, ~~or C~~C, or D not met. OR UHS inoperable for reasons other than Condition A, B, ~~or C~~C, or D.	~~D~~E.1 Be in MODE 3. AND ~~D~~E.2 Be in MODE 5.	6 hours 36 hours	RCOL4_16-4 CTS-01133 RCOL4_16-4 CTS-01133

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY	
SR 3.7.9.1	Verify each required UHS basin water level is ≥ ~~2,850,000~~2,800,000 gallons.	In accordance with the Surveillance Frequency Control Program	RCOL2_09.02.05-5
SR 3.7.9.2	Verify water temperature of UHS is ≤ ~~95~~93°F.	In accordance with the Surveillance Frequency Control Program	RCOL2_09.02.05-14
SR 3.7.9.3	Operate each cooling tower fan for ≥ 15 minutes.	In accordance with the Surveillance Frequency Control Program	
SR 3.7.9.4	Verify each cooling tower fan starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program	
SR 3.7.9.5	Verify each UHS transfer pump starts on manual actuation~~operation~~.	In accordance with the Inservice Testing Program	RCOL4_16-1 RCOL4_16-7 RCOL4_16-18

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources - Operating

LCO 3.8.1 The following ac electrical sources shall be OPERABLE:

a. Two qualified circuits between the offsite transmission network and the onsite Class 1E ac electrical power distribution system,

b. Three Class 1E Gas Turbine Generators (GTGs) capable of supplying the onsite Class 1E power distribution subsystem(s), and

c. The associated automatic load sequencers for each required Class 1E GTG shall be OPERABLE.

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

ACTIONS

----------NOTE----------
LCO 3.0.4.b is not applicable to Class 1E GTGs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for required OPERABLE offsite circuit.	1 hour AND Once per 8 hours thereafter
	AND	MAP-16-205
	A.2 Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
	AND	
	A.~~2~~3.1 Restore required offsite circuit to OPERABLE status.	72 hours MAP-16-205

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	OR A.~~2~~3.2 ----------NOTE---------- This Required Action is not applicable in MODE 4. ---------- Apply the requirements of Specification 5.5.18.	MAP-16-205 72 hours
B. One required Class 1E GTG inoperable.	B.1 Perform SR 3.8.1.1 for the required offsite circuit(s). AND B.2 Declare required feature(s) supported by the inoperable Class 1E GTGs inoperable when its required redundant feature in a train with an OPERABLE Class 1E GTG is inoperable. AND B.3.1 Determine OPERABLE Class 1E GTGs are not inoperable due to common cause failure. OR B.3.2 Perform SR 3.8.1.2 for OPERABLE Class 1E GTGs.	1 hour AND Once per 8 hours thereafter 4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s) 24 hours 24 hours

Bases

Bases – Tracking Report Revision List

Change ID No.	Section	TS Rev 1 Page*	Reason for change	Change Summary	Rev. of T/R
RCOL4_16-8	B 3.7.9	B3.7.9-2 B3.7.9-3	Response to RAI No. 90 Luminant Letter no.TXNB-09064 Date 11/11/2009	Revised bases for Completion Time of condition A.	-
RCOL4_16-4	B 3.7.9	B3.7.9-3 B3.7.9-4	Response to RAI No. 90 Luminant Letter no.TXNB-09064 Date 11/11/2009	Bases for Condition B was divided into Condition B and new Condition C to address basin temperature and water level, respectively. Each Bases for Completion Time was revised in accordance with the change of specification. Following Condition IDs were moved up due to new Condition C.	-
RCOL4_16-1	B 3.7.9	B3.7.9-5	Response to RAI No. 90 Luminant Letter no.TXNB-09064 Date 11/11/2009	The Bases for Surveillance Requirement 3.7.9.5 was changed in accordance with the change of Surveillance Requirement.	-
RCOL4_16-7	B 3.7.9	B3.7.9-5	Response to RAI No. 90 Luminant Letter no.TXNB-09064 Date 11/11/2009	The Bases for SR 3.7.9.5 was revised in accordance with the change of SR 3.7.9.5 Frequency.	-
RCOL4_16-5	B 3.7.9	B3.7.9-5	Response to RAI No. 90 Luminant Letter no.TXNB-09064 Date 11/11/2009	Bases for SR 3.7.9.6 and SR 3.7.9.7 were newly added.	-
RCOL4_16-2	B 3.7.9	B3.7.9-1	Response to RAI No. 90 Luminant Letter no.TXNB-09064 Date 11/11/2009	Added the following sentence: “The stored water level provides adequate net positive suction head (NPSH) to the ESW pump during a 30-day period of operation following the design basis LOCA without makeup.”	-
RCOL4_16-3	B 3.7.9	B3.7.9-4	Response to RAI No. 90 Luminant Letter no.TXNB-09064 Date 11/11/2009	Added justification for the selected Completion Time of 7 days for Required Actions D.1 and D.2.1.	-
RCOL4_16-2	B 3.7.9	B3.7.9-4	Response to RAI No. 90 Luminant Letter no.TXNB-09064 Date 11/11/2009	Added the following sentence to the bases of SR 3.7.9.1: “Plant procedures provide the corresponding water level to be verified to assure a usable volume of 2,850,00 gallons, accounting for unusable volume and measurement uncertainty.”	-

Change ID No.	Section	TS Rev 1 Page*	Reason for change	Change Summary	Rev. of T/R
RCOL4_16-7	B 3.7.9	B3.7.9-5	Response to RAI No. 90 Luminant Letter no.TXNB-09064 Date 11/11/2009	REFERENCES, first reference: "FSAR Chapter 9" was revised to "FSAR Subsection 9.2.5."	-
RCOL2_16-13	B 3.3.2	B 3.3.2-56	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Revised Bases for SR 3.3.2.4 in accordance with the addition of the following statement to SR 3.3.2.4. "The Actuation Outputs are solid state devices."	-
RCOL2_16-14	B 3.3.2	B 3.3.2-5	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Corrected the following editorial error: The Comanche Peak Units 3 and 4 Bases, BACKGROUND, page B 3.3.2-5 (second paragraph), misspells the word "self-tested" in the first sentence.	-
RCOL2_16-16	B 3.3.1	B 3.3.1-2	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Replaced "specified" with "administered" Replaced "Table 3.3.1" with "the Setpoint Control Program (SCP) Replaced "channel" with "measured" Replaced "setpoints" with "setting"	-
RCOL2_16-16	B 3.3.1	B 3.3.1-5	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Replaced "specified" with "administered" Replaced "Table 3.3.1-1" with "the SCP" Deleted "digital"	-
RCOL2-16-16	B 3.3.1	B 3.3.1-6	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Added "Normal" for "Trip Setpoint" in three portions. Replaced "band for CHANNEL CALIBRATION uncertainty allowance" with "established Calibration Tolerance (CT) band, in accordance with the methods and assumptions in the SCP" Added "NOTE: The Allowance Value…limit is reached"	-
RCOL2_16-16	B 3.3.1	B 3.3.1-7	Response to RAI No. 91 Luminant Letter no.TXNB-09064	Replaced "accuracy value" with "value measured during surveillance testing" Added "For digital functions Allowable Values are defined …to the Nominal	-

Change ID No.	Section	TS Rev 1 Page*	Reason for change	Change Summary	Rev. of T/R
			Date 11/11/2009	Trip Setpoint" Replaced "Nominal" with "Limiting"	
RCOL2_16-16	B 3.3.1	B 3.3.1-8	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Added "or train" in four portions. Deleted "In Table 3.3.1-1, the value…specific instrumentations"	-
RCOL2_16-16	B 3.3.1	B 3.3.1-41	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Replaced "the assumptions used in analytically calculating the required channel accuracies" with "Section 5.5.21 SCP"	-
RCOL2_16-16	B 3.3.1	B 3.3.1-49	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Replace "the assumptions of…values methodology" with "the methods and assumptions in Section 5.5.21 SCP"	-
RCOL2_16-16	B 3.3.2	B 3.3.2-2	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Replaced "an output from a digital bistable" with "a bistable output"	-
RCOL2_16-16	B 3.3.2	B 3.3.2-3	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Replaced "specified" with "administered" Replace "Table 3.3.2.1" with "the SCP" Deleted "digital"	-
RCOL2_16-16	B 3.3.2	B 3.3.2-4	Response to RAI No. 91 Luminant Letter no.TXNB-09064	Added "Normal" for "Trip Setpoint in two portions" Deleted "digital"	-

Change ID No.	Section	TS Rev 1 Page*	Reason for change	Change Summary	Rev. of T/R
			Date 11/11/2009	Replaced "band for CHANNEL CALIBRATION uncertainty allowance" with "established Calibration Tolerance (CT) band, in accordance with the methods and assumptions in the SCP"	
RCOL2_16-16	B 3.3.2	B 3.3.2-5	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Deleted "digital"	-
RCOL2_16-16	B 3.3.2	B 3.3.2-6	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Deleted 4th paragraph of Section "Applicable Safety Analyses, LCO, and Applicability"	-
RCOL2_16-16	B 3.3.2	B 3.3.2-34	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Deleted "with which to associate a trip Setpoint and Allowance Value"	-
RCOL2_16-16	B 3.3.2	B 3.3.2-54	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Replaced "the assumptions used in analytically calculating the required channel accuracies" with "Section 5.5.21, SCP"	-
RCOL2_16-16	B 3.3.2	B 3.3.2-57	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Replaced "defined by the Allowance Value" with "described in Section 5.5.21 SCP" Replaced "the assumptions of…setpoint methodology" with "the methods and assumptions in Section 5.5.21 SCP"	-
RCOL2_16-16	B 3.3.5	B 3.3.5-1	Response to RAI No. 91 Luminant Letter no.TXNB-	Replaced "uncertainty assumptions…terms assigned" with "Section 5.5.21 SCP"	-

Change ID No.	Section	TS Rev 1 Page*	Reason for change	Change Summary	Rev. of T/R
			09064 Date 11/11/2009	Replaced “the Allowable Value” with “Section 5.5.21 SCP” Added “The time delay of the Class…in Chapter 15” Deleted “Allowable Values…in SR 3.3.5.3”	
RCOL2_16-16	B 3.3.5	B 3.3.5-5	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Deleted “In SR 3.3.5.3, the value…specific instrumentations” Replaced “the assumptions of the unit…setpoint methodology” with “the methods and assumptions in Section 5.5.21 SCP”	-
RCOL2_16-16	B 3.3.5	B 3.3.5-6	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Deleted “In SR 3.3.5.3, the values specified…specific instrumentations”	-
RCOL2_16-16	B 3.3.6	B 3.3.6-3	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Replaced “specified” with “administered” Replaced “Table 3.3.6-1” with “the SCP”	-
RCOL2_16-16	B 3.3.6	B 3.3.6-5	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Added “Nominal” and “Limiting”	-
RCOL2_16-16	B 3.3.6	B 3.3.6-6	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Deleted “In Table 3.3.6.1, the values…specific instrumentations”	-

Change ID No.	Section	TS Rev 1 Page*	Reason for change	Change Summary	Rev. of T/R
RCOL2_16-16	B 3.3.6	B 3.6.6-10	Response to RAI No. 91 Luminant Letter no.TXNB-09064 Date 11/11/2009	Replaced “specified” with “administered” Replaced “Table 3.3.5” with “the SCP” Replaced “the assumptions of…setpoint methodology” with “the methods and assumptions in Section 5.5.21 SCP”	-
RCOL2_09.02.05-05	3.7.9	B3.7.9-2 B3.7.9-4	Response to RAI No. 121 Luminant Letter No. TXNB-09081 Date 12/16/2009	Revised surveillance requirement SR 3.7.9.1 and description for LCO to change the water level from 2,850,000 gallons to 2,800,000 gallons.	-
RCOL2_09.02.05-14	3.7.9	B3.7.9.2 B3.7.9.5	Response to RAI No. 121 Luminant Letter No. TXNB-09081 Date 12/16/2009	Revised water temperature for Surveillance Requirement SR 3.7.9.2 from 95 to 93 degrees F.	-
RCOL2_09.02.05-14	3.7.9	B3.7.9-2	Response to RAI No. 121 Luminant Letter No. TXNB-09081 Date 12/16/2009	Revised second paragraph of Applicable Safety Analysis to provide description that the operating limits are based on shutdown with LOOP. Revised LCO section to provide clarification that the ESWS will remove heat during a shutdown with LOOP and also revised the temperature from 95 to 93 degrees F.	-
-	-	-	Consistency with DCD Rev.2 Incorporate editorial relevant changes from Chapter 16 of DCD Revision 2	Incorporate changes as describe in MHI Letter DCD Revision 2 # UAP-HF-09490 dated 10/27/2009	0
RCOL2_16-18	3.7.9	B 3.7.9-6	Response to RAI No. 149 Luminant Letter no.TXNB-10028 Date 4/5/2010	Reverted the surveillance frequency change for SR 3.7.9.5, which was made in Response to RAI No. 90 (RCOL2_16-7).	-

Change ID No.	Section	TS Rev 1 Page*	Reason for change	Change Summary	Rev. of T/R
DCD_16-300	B 3.3.1	B 3.3.1-34	Reflect response to DCD RAI No. 520	Revised sentence to correct typographical error.	1
DCD_16-300	B 3.3.1	B 3.3.1-34	Reflect response to DCD RAI No. 520	Added “time limit” to last sentence.	1
DCD_16-300	B 3.3.1	B 3.3.1-37	Reflect response to DCD RAI No. 520	Deleted description as follows: “, and Turbine Trip – main Turbine Stop Valve Position”	1
DCD_16-300	B 3.3.1	B 3.3.1-40	Reflect response to DCD RAI No. 520	Added description about completion time of RTS channels.	1
DCD_16-300	B 3.3.1	B 3.3.1-40 B 3.3.1-41 B 3.3.1-44	Reflect response to DCD RAI No. 520	Revised sentence to correct typographical error.	1
DCD_16-300	B 3.3.1	B 3.3.1-44	Reflect response to DCD RAI No. 520	Replaced “(3) The Manual Reactor Trip hardware switches” with “(3) The Manual Reactor Trip Test for verification of RTB operability using the hardware switches”.	1
DCD_16-300	B 3.3.1	B 3.3.1-45 B 3.3.1-46	Reflect response to DCD RAI No. 520	Replaced "RTS" with "PSMS"	1
DCD_16-300	B 3.3.1	B 3.3.1-47	Reflect response to DCD RAI No. 520	Deleted "over"	1
MAP-16-206	B 3.3.1	B 3.3.1-50	Reflect responses to DCD Draft Open Items 16.4.6	Added description about time response variation of the dynamic transfer functions.	1
MAP-16-207	B 3.3.1 B 3.3.2	B 3.3.1-51 B 3.3.2-59	Reflect responses to DCD Draft Open Items 16.4.6	Added description about technical reports that provide information on response time.	1

Change ID No.	Section	TS Rev 1 Page*	Reason for change	Change Summary	Rev. of T/R
DCD_16-300	B 3.3.2	B 3.3.2-28	Reflect response to DCD RAI No. 520	Capitalized "Coincident" and "No"	1
DCD_16-300	B 3.3.2	B 3.3.2-33	Reflect response to DCD RAI No. 520	Capitalized "Level" and "No"	1
DCD_16-300	B 3.3.2	B 3.3.2-37	Reflect response to DCD RAI No. 520	Replaced “without” with “including”	1
DCD_16-300	B 3.3.2	B 3.3.2-40	Reflect response to DCD RAI No. 520	Capitalized second low in "Low-Low"	1
MAP-16-208	B 3.3.2	B 3.3.2-58	Reflect responses to DCD Draft Open Items 16.4.6	Added description about time response variation of the dynamic transfer functions.	1
MAP-16-209	B 3.3.3	B 3.3.3-4	Reflect responses to DCD Draft Open Items 16.4.6	Added description about PAM function of RCS Hot Leg and Cold Leg Wide Range.	1
MAP-16-210	B 3.3.3	B 3.3.3-6	Reflect responses to DCD Draft Open Items 16.4.6	Added description about PAM function of Steam Generator Water Level Wide Range.	1
MAP-16-211	B 3.3.3	B 3.3.3-10	Reflect responses to DCD Draft Open Items 16.4.6	Deleted description about alternate means of temperature, level, and flow measurement.	1
DCD_16-300	B 3.3.5	B 3.3.5-6	Reflect response to DCD RAI No. 520	Replaced “Channel” with “CHANNEL”	1
DCD_16-300	B 3.3.6	B 3.3.6-5 B 3.3.6-6	Reflect response to DCD RAI No. 520	Revised sentence to correct typographical error.	1
DCD_14.02-120	B 3.4.13 B 3.4.15	B 3.4.13-5 B 3.4.15-6	Reflect response to DCD RAI No. 521	Updated RG 1.45 reference.	1

Change ID No.	Section	TS Rev 1 Page*	Reason for change	Change Summary	Rev. of T/R
MAP-16-204	B 3.5.2	B 3.5.2-7	Reflect responses to DCD Draft Open Items 16.4.8	Incorporated bases for SR 3.5.2.4.	1
DCD_09.04.01-12A	B 3.7.10	B 3.7.10-10	Reflect response to DCD RAI No. 475	Replaced “the system” with “all potential operating configurations of two trains of 50% capacity MCRATCS air handling units”.	1
MAP-16-205	B 3.8.1	B 3.8.1-5 [B 3.8.1-6]	Reflect responses to DCD Draft Open Items 16.4.11	Incorporated bases for required action A.2	1
MAP-16-212	B 3.8.1	B 3.8.1-18 [B 3.8.1-19]	Reflect responses to DCD Draft Open Items 16.4.11	Clarified power factor discussion.	1
MAP-16-213	B 3.8.3	B 3.8.3-6 B 3.8.3-8	Reflect responses to DCD Draft Open Items 16.4.6	Deleted descriptions related to ASTM D4176-04.	1

*Page numbers for the attached marked-up pages may differ from the revision 1 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

BASES

ACTIONS (continued)

A known required inoperable channel must be placed in the tripped condition within 72 hours. Placing the channel in the tripped condition results in a partial trip condition requiring only one-out-of-two logic (for the trip functions where the required number of operable channels is three) or one-out-of three logic (for the trip functions where the required number of operable channels is four) for actuation of the two-out-of-N trips, where N is three or four (depending on the required number of operable channels). The 72 hours allowed to place the inoperable channel in the tripped condition is justified because the remaining two operable channels (for the trip functions where the required number of operable channels is three) or the remaining three operable channels (for the trip functions where the required number of operable channels is four) have automatic self-testing (as described for COT), and automatic CHANNEL CHECKS. DCD_16-300

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

The number of Required Channels for the High Power Range Neutron Flux Rate is four. Four channels are required because each channel measures neutron flux in one quadrant of the core. Anomalies occurring in one core quadrant can be seen by the neutron flux detector in that quadrant and by the neutron detectors in the two adjacent quadrants, but not by the deterctor in the opposite quadrant. So to ensure event detection and accomodate a single failure, neutron flux detectors must be operable in all four quadrants.

The Required Actions have been modified by a Note that allows placing the inoperable channel in the bypassed condition for up to 12 hours while performing routine surveillance testing of the other channels. The 12 hour time limit is based on operating experience. DCD_16-300

The initial completion time of 72 hours is justified in the PSMS reliability analysis, considering that the remaining operable channels have continuous self-testing. For detail information, refer to the US-APWR Technical Report MUAP-07030 PRA, Attachment 6A.12. The result of the PSMS reliability analysis is evaluated and confirmed in the US-APWR PRA Chapter 19.

One channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment. The 12 hour bypass limit is justified in the PSMS reliability analysis, considering that the remaining operable channels have continuous self-testing. For detail information, refer to the US-APWR

BASES

ACTIONS (continued)

L.1 and L.2

Condition L applies to the following reactor trip Functions:

- Low Pressurizer Pressure,
- High Pressurizer Water Level,
- Low Reactor Coolant Flow,
- Low Reactor Coolant Pump Speed,
- High-High SG Water Level, and
- Turbine Trip – Turbine Emergency Trip Oil Pressure. ~~, and~~
- ~~Turbine Trip – Main Turbine Stop Valve Position.~~

DCD_16-300

With one required channel inoperable, the inoperable channel must be placed in the tripped condition within 72 hours. Placing the channel in the tripped condition when above the P-7 setpoint results in a partial trip condition requiring only one additional channel to initiate a reactor trip.

These Functions do not have to be OPERABLE below the P-7 setpoint because there is insufficient heat production to generate DNB conditions below the P-7 setpoint. The 72 hours allowed to place the channel in the tripped condition is justified because the remaining two operable channels have automatic self-testing (as described for COT), and automatic CHANNEL CHECKS. An additional 6 hours is allowed to reduce THERMAL POWER to below P-7 if the inoperable channel cannot be restored to OPERABLE status or placed in trip within the specified Completion Time.

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

Except for Pressurizer Pressure, Pressurizer Level, and SG Water Level, one channel may be bypassed for up to 12 hours for surveillance testing. The 12 hours bypass limit is justified in the PSMS reliability analysis, considering that the remaining operable channels have continuous self-testing. For detail information, refer to the US-APWR Technical Report MUAP-07030 PRA, Attachment 6a.12. The result of the PSMS reliability analysis is evaluated and confirmed in the US-APWR PRA Chapter 19.

BASES

ACTIONS (continued)

Action Q.2 allows the option to apply the requirements of Specification 5.5.18 to determine a Risk Informed Completion Time.

R.1 and R.2

Condition R applies to the RTS Automatic Trip Logic in MODES 1 and 2. These actions address the train orientation of the RTS for these Functions. With one required train inoperable, 24 hours are allowed to restore the train to OPERABLE status. The Completion Time of 24 hours is reasonable considering that in this Condition, the two remaining OPERABLE trains are adequate to perform the safety function and given the low probability of an event during this interval. The 24 hours allowed to restore the train to OPERABLE status also considers that the two remaining OPERABLE trains each have automatic self-testing as described for ACTUATION LOGIC TEST. Required Action R.2 allows the option to apply the requirements of Specification 5.5.18 to determine a Risk Informed Completion Time.

The Required Actions have been modified by a Note that allows bypassing one inoperable train up to 4 hours for surveillance testing, provided the other two trains are OPERABLE.

S.1

Condition S applies when the Required Action and associated Completion Time for Condition N, Q, or R have not been met. If the train cannot be returned to OPERABLE status, the unit must be placed in a MODE where the requirement does not apply. This is accomplished by placing the unit in MODE 3 within 6 hours. The Completion Time of 6 hours is a reasonable time, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems.

Placing the unit in MODE 3 from Condition N results in Condition D entry while an RTB is inoperable.

(From Condition Q) With the unit in MODE 3, Condition D would apply to any inoperable RTB trip mechanism.

T.1 and T.2

Condition T applies to Main Turbine Stop Valve Closure. With one channel inoperable, the inoperable channel must be placed in the trip condition within 12 hours. If placed in the tripped condition, this results in a partial trip condition requiring three additional channels to initiate a reactor trip. If the channel can not be restored to OPERABLE status or placed in the trip condition, then power must be reduced below the P-7 setpoint within the

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BASES

ACTIONS (continued)

next 6 hours. The 6 hours allowed for reducing power is consistent with other power reduction action completion times.

The Required Actions are modified by a Note that allows placing one channel in bypass for up to 12 hours while performing routine surveillance testing. These times are justified because this is an anticipatory trip that is note credited in the safety analysis, and a diverse turbine trip is also initiated from the Turbine Emergency Oil Pressure. DCD_16-300

SURVEILLANCE REQUIREMENTS

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

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

Note that each channel of process protection supplies all trains of the RTS. However, when testing a Channel, it is only necessary to manually verify that the channel is OPERABLE in its respective train. This is because the interface to other trains is continuously verified through self-testing. Self-testing is confirmed through periodic COT and ACTUATION LOGIC TEST. The CHANNEL CALIBRATION is performed in a manner that is consistent with ~~the assumptions used in analytically calculating the required channel accuracies~~Section 5.5.21, SCP. RCOL2_16-16

SR 3.3.1.1

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

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

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.3

SR 3.3.1.3 compares the incore system to the NIS channel output. If the absolute difference is ≥ 3%, the NIS channel is still OPERABLE, but must be readjusted. The excore NIS channel shall be adjusted if the absolute difference between the incore and excore AFD is ≥ 3%.

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

A Note clarifies that the Surveillance is required only if reactor power is ≥ 15% RTP and that 24 hours is allowed for performing the first Surveillance after reaching 15% RTP.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.4

SR 3.3.1.4 is the performance of a TADOT. This test shall verify RTB train OPERABILITY by actuation of the two RTBs for each train to their tripped state. Each RTB may be actuated together or individually.

The RTB train test shall include three separate but overlapping tests: (1) The Undervoltage Test for verification of RTB operability using only the undervoltage trip mechanism. (2) The Shunt Trip test for verification of RTB operability using only the shunt trip mechanisms. (3) The Manual Reactor Trip Test for verification of RTB operability using the hardwired switches. The Undervoltage Test shall bypass the shunt trip mechanism, so each RTB actuates using only the undervoltage mechanism. The Shunt Trip Test shall bypass the undervoltage mechanism, so each RTB actuates using only the shunt trip mechanism. The Manual Reactor Trip Test shall actuate the RTB with both mechanisms. Figure 4.4-1 of Topical Report MUAP-07004 (Ref. 6) describes an acceptable overlapping method for conducting these three separate tests that confirms OPERABLE status. DCD_16-300 DCD_16-300

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.5

SR 3.3.1.5 is the performance of an ACTUATION LOGIC TEST. The ~~RTS~~PSMS is self-tested on a continuous basis from the digital side of all input modules to the digital side of all output modules. Self-testing also encompasses all data communications within a PSMS train, between PSMS trains and between the PSMS and PCMS. The self-testing is described in Reference 6 and 7. The ACTUATION LOGIC TEST is a check of the RTS software memory integrity to ensure there is no change to the internal RTS software that would impact its functional operation or the continuous self-test function. The software memory integrity test is described in Reference 6 and 7. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. DCD_16-300

The complete continuity check from the input device to the output device is performed by the combination of the continuous CHANNEL CHECK, the CHANNEL CALIBRATION for the non digital side of the input module, the continuous self-testing for the digital side, the COT, the ACTUATION LOGIC TEST and the TADOT for the non-digital side of the output module. The CHANNEL CALIBRATION, COT, ACTUATION LOGIC TEST and TADOT, which are manual tests, overlap with the CHANNEL CHECK and self-testing and confirm the functioning of the self-testing.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.6

SR 3.3.1.6 is a calibration of the excore channels to the incore channels. If the measurements do not agree, the excore channels are not declared inoperable but must be calibrated to agree with the incore detector measurements. If the excore channels cannot be adjusted, the channels are declared inoperable. This Surveillance is performed to verify the f(ΔI) input to the Overtemperature ΔT Function and Overpower ΔT Function.

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

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.7

SR 3.3.1.7 is the performance of a COT.

The ~~RTS~~PSMS is self-tested on a continuous basis from the digital side of all input modules to the digital side of all output modules. Self-testing encompasses all digital Trip Setpoints and trip functions. The self-testing is described in Reference 6 and 7. The COT is a check of the RTS software memory integrity to ensure there is no change to the internal RTS software that would impact its functional operation, including digital Trip Setpoint values or the continuous self-test function. The software memory integrity test is described in Reference 6 and 7. DCD_16-300

A COT ensures the entire channel will perform the intended Function. A COT also ensures that the logic processing for interlocks (i.e., P-6 and P-10) is operating correctly. The combination of the COT, CHANNEL CALIBRATION, continuous self-testing and continuous CHANNEL CHECK ensures the comple P-6 and P-10 interlocks are operating correctly.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

The complete continuity check from the input device to the output device is performed by the combination of the continuous CHANNEL CHECK, the CHANNEL CALIBRATION for the non digital side of the input module, the continuous self-testing for the digital side, the COT, the ACTUATION LOGIC TEST and the TADOT for the non-digital side of the output module.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The CHANNEL CALIBRATION, COT, and TADOT, which are manual tests, overlap with the CHANNEL CHECK and self-testing and confirm the functioning of the self-testing.

The Note allows a normal shutdown to proceed without a delay for testing in MODE 2 and for a short time in MODE 3 until the RTBs are open and SR 3.3.1.7 is no longer required to be performed. If the unit is to be in MODE 3 with the RTB closed for 4 hours this Surveillance must be performed prior to ~~over~~ 4 hours after entry into MODE 3. DCD_16-300

SR 3.3.1.8

Performance of the CHANNEL CHECK within 4 hours after reducing power below P-6 and the frequency in accordance with the Surveillance Frequency Control Program ensures that gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

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

The Frequency of 4 hours is based on the need to verify OPERABILITY of the SR instruments within a reasonable time after being re-energized. The Surveillance Frequency thereafter is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.13

SR 3.3.1.13 verifies that the response times for all RTS functions are less than or equal to the maximum values assumed in the accident analysis. Accident analysis response time values are defined in Reference 2. Individual component response times are not modeled in the analyses.

The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the Trip Setpoint value at the sensor to the point at which the equipment reaches the required functional state (i.e. control and shutdown rods fully inserted in the reactor core).

RTBs and RTDs are known to have aging or wear-out mechanisms that can impact response time and require response time measurement. Response time for other components can be affected by random failures or calibration discrepancies, which can be detected by other testing and calibration methods required by other surveillances.

The PSMS dynamic transfer functions employ time constants that are installed as digital values and processed through digital algorithms. Therefore, the time response of the dynamic transfer functions has no potential for variation due to time or environmental drift or component aging. The COT confirms the integrity of the time constants and algorithms through the periodic software memory integrity check. The complete PSMS response time is determined one time by analysis and confirmed one time in the factory test. The response times of analog instruments that provide input to the dynamic transfer functions are periodically checked in Surveillance 3.3.1.13, because they do have the potential for response time variation. MAP-16-206

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor, signal conditioning, and actuation logic response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) in place, onsite, or offsite (e.g., vendor) test measurements, or (3) utilizing vendor engineering specifications.

The allocations for sensor, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not

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SURVEILLANCE REQUIREMENTS (continued)

impact response time provided the parts used for repair are of the same type and value. One example where response time could be affected is replacing the sensing assembly of a transmitter.

MUAP-09021-P "Response time of safety I&C System" provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. Section 4.4 of MUAP-07005, "Safety System Digital Platform -MELTAC-" describes how response times of each individual MELTAC module are combined to determine the total digital system response time. MAP-16-207

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.13 is modified by a Note stating that neutron detectors are excluded from RTS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response.

REFERENCES

1. Regulatory Guide 1.105, Revision 3, "Setpoints for Safety Related Instrumentation."

2. FSARSection 7.2.

3. FSAR Chapter 15.

4. IEEE-603-1991.

5. 10 CFR 50.49.

6. MUAP-07004-P (Proprietary) and MUAP-07004-NP (Non-Proprietary), “Safety I&C System Description and Design Process.”

7. MUAP-07005-P (Proprietary) and MUAP-07005-NP (Non-Proprietary), “Safety System Digital Platform – MELTAC.”

8. 10 CFR 50.36.

9. FSAR Section 6.2.1.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

b. Emergency Feedwater Isolation - Actuation Logic and Actuation Outputs

Actuation Logic and Actuation Outputs consist of the same features and operate in the same manner as described for ESFAS Function 1.b. Emergency Feedwater isolation valves are distributed to Trains A and D. Trains A and D must be OPERABLE.

Manual and automatic initiation of EFW Isolation Functions must be OPERABLE in MODES 1, 2, and 3 when the SGs are in operation. In MODES 4, 5, and 6, SGs are not in service and this Function is not require to be OPERABLE.

c. Emergency Feedwater Isolation - High Steam Generator Water Level ~~e~~Coincident with P-4 signal and ~~n~~No Low Main Steam Line Pressure DCD_16-300

This signal provides protection against damaged SG overfill. There are four High Steam Generator Water Level channels in a two-out-of-four logic configuration for each Steam Generator. The ESFAS SG water level instruments provide input to the SG Water Level Control System. The interface from the safety channels in the PSMS to the PCMS is through the Signal Selector Algorithm (SSA). The SSA ensures an input failure to the control system does not result in erroneous control system action that would require the protection function actuation. Therefore, the protection function requires only two additional channels to provide the protection function actuation. Three channels total must be OPERABLE.

The transmitters (d/p cells) are located inside containment. However, the events that this Function protects against cannot cause a severe environment in containment. Therefore, the Trip Setpoint reflects only steady state instrument uncertainties.

High Steam Generator Water Level must be OPERABLE in MODES 1, 2 and 3 (above P-11) when the SGs are in operation. This signal may be manually blocked by the operator below the P-11 setpoint. This function is not required to be OPERABLE in MODE 3 below the P-11 setpoint. In MODES 4, 5, and 6, SGs

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

11. Engineered Safety Feature Actuation System Interlocks

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

a. Engineered Safety Feature Actuation System Interlocks - Reactor Trip, P-4

The P-4 interlock is enabled when RTBs have opened in two out of four RTB trains. RTB position signals from each RTB are interfaced to all PSMS trains via internal PSMS data links so that the P-4 interlock is generated independently within each train. Therefore this LCO requires three trains to be OPERABLE.

This Function allows operators to take manual control of ECCS systems after the initial phase of ECCS Actuation is complete. Once ECCS is overridden, automatic actuation of ECCS cannot occur again until the RTBs have been manually closed. The functions of the P-4 interlock are:

- Trip the main turbine,
- Isolate MFW with coincident low T_{avg},
- Enable a manual override of ECCS Actuation and prevent ECCS reactuation,
- EFW Isolation with coincident High SG Water ~~l~~Level and ~~n~~No Low Main Steam Line Pressure, and | DCD_16-300
- Trip the Reactor Coolant Pump with coincident ECCS Actuation.

Each of the above Functions except Reactor Coolant Pump Trip is interlocked with P-4 to avert or reduce the continued cooldown of the RCS following a reactor trip. An excessive cooldown of the RCS following a reactor

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Purge Isolation instrumentation must be OPERABLE in these MODES.

While in MODES 5 and 6 ~~without~~including fuel handling in progress, the Containment Purge Isolation instrumentation need not be OPERABLE since the potential for radioactive releases is minimized and operator action is sufficient to ensure post accident offsite doses are maintained within acceptable limits. DCD_16-300

13. Main Control Room Isolation

The Main Control Room Isolation function provides an enclosed main control room environment from which the unit can be operated following an uncontrolled release of radioactivity. MCR Isolation controls the main control room HVAC System (MCRVS) which includes two subsytems: Main Control Room Emergency Filtration System (MCREFS) and Main Control Room Air Temperature Control System (MCRATCS), described in the DCD Chapter 16 Section 3.7.10

There are four Main Control Room Isolation trains. Train A and D of MCR Isolation control two 100% capacity trains of subsystem MCREFS, and all four trains of MCR Isolation control four 50% capacity trains of subsystem MCRATCS. Two trains of MCR Isolation, including A or D, must actuate to properly provide the safety function (i.e., isolate and supply filtered air to the main control room) andthree trains, including A and D, must be OPERABLE to provide the safety function with a concurrent single failure.

The MCR Isolation actuation instrumentation consists of redundant radiation monitors. A high radiation signal will initiate all four MCR Isolation trains. The main control room operator can also initiate MCR Isolation trains by manual switches in the main control room. MCR Isolation is also actuated by an ECCS Actuation signal.

The main control room must be kept habitable for the operators stationed there during accident recovery and post accident operations. The MCR Isolation function acts to terminate the supply of unfiltered outside air to the main control room, initiate filtration, and allows pressurization of the main control room. These actions are necessary to ensure the main control room is kept habitable for the operators stationed there during

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

a. Block Turbine Bypass and Cooldown Valves - Manual Initiation

Manual initiation of Block Turbine Bypass and Cooldown Valves can be accomplished from the main control room. There are two switches in the main control room, one for each train. This LCO requires 2 Manual Block Turbine Bypass and Cooldown Valves Actuation switches. Operation of either switch will actuate this Function.

b. Block Turbine Bypass and Cooldown Valves - Actuation Logic and Actuation Outputs

Actuation Logic and Actuation Outputs consist of the same features and operate in the same manner as described for ESFAS Function 1.b. Block turbine bypass and cooldown valves are distributed to Trains A and D. Both trains must be OPERABLE.

c. Block Turbine Bypass and Cooldown Valves - Low-~~l~~Low T_{avg} Signal DCD_16-300

This function must be OPERABLE in MODES 1, 2 and 3. In MODES 4, 5, and 6, the average coolant temperature is below the low-low Tavg signal setpoint and this function is not required to be OPERABLE.

The ESFAS instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii) (Ref. 9).

ACTIONS

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

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note stating that this test should include verification that the time constants are adjusted to the prescribed values where applicable.

SR 3.3.2.8

This SR ensures the response times for all ESFAS functions are less than or equal to the maximum values assumed in the accident analysis. Accident analysis response time values are defined in Reference 2. Individual component response times are not modeled in the analyses.

The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the Trip Setpoint value at the sensor, to the point at which the equipment in all trains reaches the required functional state (e.g., pumps at rated discharge pressure, valves in full open or closed position).

Electro-mechanical components in the ESFAS have aging or wear-out mechanisms that can impact response time. Response time for other components may be affected by random failures or calibration discrepancies, which are detectable by other testing and calibration methods required by other surveillances.

MAP-16-208

The PSMS dynamic transfer functions employ time constants that are installed as digital values and processed through digital algorithms. Therefore, the time response of the dynamic transfer functions has no potential for variation due to time or environmental drift or component aging. The COT confirms the integrity of the time constants and algorithms through the periodic software memory integrity check. The complete PSMS response time is determined one time by analysis and confirmed one time in the factory test. The response times of analog instruments that provide input to the dynamic transfer functions are periodically checked in Surveillance 3.3.2.8, because they do have the potential for response time variation.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor, signal conditioning and actuation logic response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) in place, onsite, or offsite (e.g., vendor) test measurements, or (3) utilizing vendor engineering specifications.

The allocations for sensor, signal conditioning, and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. One example where response time could be affected is replacing the sensing assembly of a transmitter.

MUAP-09021-P "Response Time of Safety I&C System" provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. Section 4.4 of MUAP-07005, "Safety System Digital Platform -MELTAC-" describes how response times of each individual MELTAC module are combined to determine the total digital system response time. MAP-16-207

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note that clarifies that the tests for the turbine driven EFW pumps are conducted within 24 hours after reaching 1000 psig in the SGs.

SR 3.3.2.9

SR 3.3.2.9 is the performance of a TADOT for the P-4 Reactor Trip Interlock, and the Frequency is once per RTB cycle. Each RTB status contact is tested up to, and including, the signal status readout on a digital display. This Frequency is based on operating experience demonstrating that undetected failure of the P-4 interlock sometimes occurs when the RTB is cycled.

The SR is modified by a Note that excludes verification of setpoints during the TADOT. The Function tested has no associated setpoint.

BASES

LCO (continued)

In addition, RCS cold leg temperature is used in conjunction with RCS hot leg temperature to verify the unit conditions necessary to establish natural circulation in the RCS.

The PAM function of RCS Hot Leg and Cold Leg Temperature Wide Range is to monitor the core cooling condition. There will be little temperature deviation between the Hot Leg and Cold Leg after an accident and reactor shutdown. Thus, Hot Leg and Cold Leg Temperature can be defined as equivalent parameters to monitor the trend of core cooling. Thus, Hot Leg and Cold Leg Temperature of the same loop are pair PAM functions credited for compliance with the single failure criteria. Therefore, only one of each channel of Hot Leg Temperature and Cold Leg Temperature are required in each loop, since with a failure of either channel adequate core cooling can still be monitored. MAP-16-209

4. Reactor Coolant System Pressure (Wide Range)

RCS wide range pressure is provided for verification of core cooling and RCS integrity long term surveillance.

5. Reactor Vessel Water Level

Reactor Vessel Water Level is provided for verification and long term surveillance of core cooling. It is also used for accident diagnosis and to determine reactor coolant inventory adequacy.

6. Containment Pressure

Containment Pressure is provided for verification of RCS and containment OPERABILITY and is used to verify closure of main steam isolation valves (MSIVs), and containment spray Phase B isolation when High-3 containment pressure is reached. Additionally, Containment Pressure is provided for indication of maintaining RCS integrity and containment integrity.

7. Containment Isolation Valve Position

Penetration Flow Path CIV Position is provided for verification of Containment OPERABILITY, and Phase A and Phase B isolation.

BASES

LCO (continued)

SG Water Level (Wide Range) is used to:

- identify the faulted SG following a tube rupture,
- verify that the intact SGs are an adequate heat sink for the reactor,
- determine the nature of the accident in progress (e.g., verify an SGTR), and
- verify unit conditions for termination of SI during secondary unit HELBs outside containment.

Operator action is based on the control room indication of SG level. The RCS response during a design basis small break LOCA depends on the break size. For a certain range of break sizes, the boiler condenser mode of heat transfer is necessary to remove decay heat. Extended startup range level is a Type A variable because the operator must manually raise and control SG level to establish boiler condenser heat transfer. Operator action is initiated on a loss of subcooled margin. Feedwater flow is increased until the indicated extended startup range level reaches the boiler condenser setpoint. This function is an alternate mean with EFW Flow.

The PAM function of Steam Generator Water Level Wide Range and Emergency Feedwater Flow is to monitor heat removal capability of the Steam Generators. Since during accident or shutdown condition, SG water level is directly attributed to emergency feedwater flow, either provides an indication of SG heat removal capability. Thus the SG Water Level Wide Range and EFW Flow can be defined as equivalent parameters to monitor the heat removal capability of the secondary. Thus, the SG Water Level and EFW Flow of same loop are pair PAM functions credited for compliance with the single failure criteria. Therefore, only one set of each channel of SG Water Level and EFW Flow are required in each loop, since with a failure of either channel adequate heat removal capability can still be monitored. MAP-16-210

12,13,14,15. Core Exit Temperature

Core Exit Temperature is provided for verification and long term surveillance of core cooling.

Twenty six core exit thermocouples are provided for measuring core cooling as the post accident monitors. These thermocouples are arranged in two safety trains and a train consists of thirteen thermocouples. These thermocouples in each train are distributed at the exit of the core nearly uniformly and a minimum of 2

BASES

ACTIONS (Continued)

Required Action C.2 is modified by a Note that indicates C.2 is only required to be performed when the Emergency Feedwater Pit Level is inoperable.

D.1

Condition D applies when the Required Action and associated Completion Time of Condition C is not met. Required Action D.1 requires entering the appropriate Condition referenced in Table 3.3.3-1 for the channel immediately. The applicable Condition referenced in the Table is Function dependent. Each time an inoperable channel has not met the Required Action of Condition C, and the associated Completion Time has expired, Condition D is entered for that channel and provides for transfer to the appropriate subsequent Condition.

E.1 and E.2

If the Required Action and associated Completion Time of Condition C is not met and Table 3.3.3-1 directs entry into Condition E, the unit must be brought to a MODE where the requirements of this LCO do not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and MODE 4 within 12 hours.

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

F.1

At this unit, alternate means of monitoring Reactor Vessel Water Level and Containment High Area Radiation have been developed and tested. ~~Also, alternate means of the RCS Hot Leg Temperature (Wide Range) and RCS Cold Leg Temperature (Wide Range) have been developed and tested. Also, alternate means of Steam Generator Water Level (Wide Range) and Emergency Feedwater Flow have been developed and tested.~~ These alternate means may be temporarily installed if the normal PAM channel cannot be restored to OPERABLE status within the allotted time. If these alternate means are used, the Required Action is not to shut down the unit but rather to follow the directions of Specification 5.6.5, in the Administrative Control section of the TS. The report provided to the NRC should discuss the alternate means used, describe the degree to which the alternate means are equivalent to the installed PAM channels, justify the areas in which they are not equivalent, and provide a schedule for restoring the normal PAM channels. MAP-16-211

BASES

SURVEILLANCE REQUIREMENTS (continued)

~~In SR 3.3.5.3, the values specified for Setpoints will be confirmed following completion of the plant specific setpoint study. These values will be calculated in accordance with the setpoint methodology after selection of plant specific instrumentations.~~ RCOL2_16-16

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.5.4

SR 3.3.5.4 is the performance of an ACTUATION LOGIC TEST. The Class 1E GTG start logic within the PSMS is self-tested on a continuous basis from the digital side of all input modules to the digital side of all output modules. Self-testing also encompasses all data communications within a PSMS train, between PSMS trains and between the PSMS and PCMS. The self-testing is described in Reference 2 and 3. The ACTUATION LOGIC TEST is a check of the PSMS software memory integrity to ensure there is no change to the internal PSMS software that would impact its functional operation or the continuous self-test function. The software memory integrity test is described in Reference 2 and 3. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

The complete continuity check from the input device to the output device is performed by the combination of the continuous CHANNEL CHECK, the CHANNEL CALIBRATION for the non digital side of the input module, the continuous self-testing for the digital side, the ACTUATION LOGIC TEST, and the ESFAS and SLS TADOT for the non-digital side of the output module. The ~~Channel~~CHANNEL CALIBRATION, ACTUATION LOGIC TEST and TADOT, which are manual tests, overlap with the CHANNEL CHECK and self-testing and confirm the functioning of the self-testing. DCD_16-300

BASES

BACKGROUND (continued)

Rod Drive Motor-Generator sets

The Rod Drive Motor-Generator sets are the electrical power supply for the CRDMs. Tripping the Rod Drive Motor-Generator sets trip devices interrupts power to the CRDMs, which allows the control rod shutdown banks and control banks to fall into the core by gravity. There are two Rod Drive Motor-Generator sets operating in parallel. The DAS trips both Rod Drive Motor-Generator sets trip devices.

The DAS interface to the Rod Drive Motor-Generator sets is via hardwired circuit. This interface may be tested, with no reactor trip, as described in subsection 7.8.2.4. Actual tripping of the Rod Drive Motor-Generator set may be tested from the DAS. Rod Drive Motor-Generator sets may be tripped one at a time for testing.

Diverse Human System Interface Panel (DHP)

The DHP provides Manual Initiation switches for all DAS automatic actuation functions and for additional functions that are required, per the D3 Coping Analysis, to control all critical safety functions. Manual Initiation switches are not redundant. To prevent spurious actuation due to a failure of any of the above switches, a separate manual actuation permissive switch is provided. This is referred to as the “Permissive Switch for DAS HSI.”

The DHP also provides indications, per the D3 Coping Analysis, to monitor all critical safety functions.

The DHP also provides indications, per the D3 Coping Analysis, to monitor RCS Leakage.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The DAS is required to provide a diverse capability to trip the reactor and actuate the specified safety-related equipment. The DAS is not credited for mitigating accidents in the FSAR Chapter 15 safety analyses. The DAS ~~satisfy~~satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii) (Ref. 5). DCD_16-300

The DAS LCO provides the requirements for the OPERABILITY of the DAS necessary to place the reactor in a shutdown condition and to remove decay heat in the event that required PSMS components do not function due to CCF.

A channel is OPERABLE provided the "as-found" accuracy value does not exceed its associated Allowable Value. A Nominal trip setpoint may be set more conservative than the Limiting Trip Setpoint as necessary in response to plant conditions. Failure of any instrument renders the affected channel(s) inoperable and reduces the reliability of the affected Functions. RCOL2_16-16

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The DAS is required to be OPERABLE in the MODES specified in Table 3.3.6-1. All functions of the DAS are required to be OPERABLE in MODES 1, 2 and 3 with the pressurizer pressure > P-11. DCD_16-300

~~In Table 3.3.6-1, the values specified for Allowable Values and Setpoints will be confirmed following completion of the plant specific setpoint study. These values will be calculated in accordance with the setpoint methodology after selection of plant specific instrumentations.~~ RCOL2_16-16

DAS functions are as follows:

1. Reactor Trip, Turbine Trip and Main Feedwater Isolation

   a. Manual Initiation

      The LCO requires 1 channel to be OPERABLE. This consists of the Reactor Trip, Turbine Trip and Main Feedwater Isolation - Manual Initiation switch. This function requires operation of the Permissive Switch for DAS HSI. The Permissive Switch for DAS HSI is common for all DAS Manual Initiation/Control Functions. The operator can initiate this function at any time by operation of both of these switches in the control room. This action will cause actuation of all components in the same manner as any of the automatic actuation signals.

   b. Automatic Actuation Logic and Actuation Outputs

      This LCO requires two channels to be OPERABLE. Actuation logic consists of all circuitry housed within the DAAC, up to the Power Interface modules responsible for actuating the ESF equipment.

   c. Low Pressurizer Pressure

      There are four Low Pressurizer Pressure channels in two-out-of-four voting logic. This automatic function is automatically blocked when status signals (P-4) are received indicating that the minimum combination of the RTBs have actuated for the RT function. The LCO requires 2 Low Pressurizer Pressure channels to be OPERABLE.

   d. High Pressurizer Pressure

      There are four High Pressurizer Pressure channels in two-out-of-four voting logic. This automatic function is

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.4.13.2

This SR verifies that primary to secondary LEAKAGE is less or equal to 150 gallons per day through any one SG. Satisfying the primary to secondary LEAKAGE limit ensures that the operational LEAKAGE performance criterion in the Steam Generator Program is met. The 150 gallons per day limit is measured at room temperature as described in Reference 5. The operational LEAKAGE rate limit applies to LEAKAGE through any one SG. If it is not practical to assign the LEAKAGE to an individual SG, all the primary to secondary LEAKAGE should be conservatively assumed to be from one SG.

The Surveillance is modified by a Note which states that the Surveillance is not required to be performed until 12 hours after establishment of steady state operation. For RCS primary to secondary LEAKAGE determination, steady state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. The primary to secondary LEAKAGE is determined using continuous process radiation monitors or radiochemical grab sampling in accordance with the EPRI guidelines (Ref. 5).

REFERENCES

1. 10 CFR 50, Appendix A, GDC 30.

2. Regulatory Guide 1.45 Revision 1, May ~~1973~~2008. DCD_14.02-120

3. FSAR Chapter 15.

4. NEI 97-06, "Steam Generator Program Guidelines."

5. EPRI, "Pressurized Water Reactor Primary-to-Secondary Leak Guidelines."

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.15.2

SR 3.4.15.2 requires the performance of a COT on the required containment atmosphere radioactivity monitor. The test ensures that the monitor can perform its function in the desired manner. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable COT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The test verifies the alarm setpoint and relative accuracy of the instrument string. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.4.15.3, SR 3.4.15.4, and SR 3.4.15.5

These SRs require the performance of a CHANNEL CALIBRATION for each of the RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, Section IV, GDC 30.

2. Regulatory Guide 1.45 Revision 1, May 2008. DCD_14.02-120

3. FSAR Chapter 5.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.4

MAP-16-204

This Surveillance demonstrates that each ECCS valve manually activated during a design basis accident event actuates to the required position. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in required position. SRs are specified in the Inservice Testing Program of the ASME Code. The ASME Code provides the activities and Frequencies necessary to satisfy the requirements.

SR 3.5.2.~~4~~5

This Surveillance demonstrates that each SI pump starts on receipt of an actual or simulated ECCS actuation signal. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.5.2.~~5~~6

MAP-16-204

Periodic inspections of the ECC/CS STRAINER ensure that it is unrestricted and stays in proper operating condition. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 35.

2. 10 CFR 50.46.

3. FSAR Subsection 6.2.1.

4. FSAR Subsection 15.6.5.

5. FSAR Chapter 19.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.10.4 (continued)

Required Action C.3 allows time to restore the CRE boundary to OPERABLE status provided mitigating actions can ensure that the CRE remains within the licensing basis habitability limits for the occupants following an accident. Compensatory measures are discussed in Regulatory Guide 1.196, Section C.2.7.3, (Ref. 4) which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 5). These compensatory measures may also be used as mitigating actions as required by Required Action C.2. Temporary analytical methods may also be used as compensatory measures to restore OPERABILITY (Ref. 6). Options for restoring the CRE boundary to OPERABLE status include changing the licensing basis DBA consequence analysis, repairing the CRE boundary, or a combination of these actions. Depending upon the nature of the problem and the corrective action, a full scope inleakage test may not be necessary to establish that the CRE boundary has been restored to OPERABLE status.

SR 3.7.10.5

This SR verifies that the heat removal capability of ~~the system~~all potential operating configurations of two trains of 50% capacity MCRATCS air handling units 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. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

DCD_09.04.01-12A

REFERENCES

1. FSAR Subsection 6.4.4.

2. FSAR Subsection 9.4.1.

3. FSAR Subsection 15.6.5.5.

4. Regulatory Guide 1.196

5. NEI 99-03, “Control Room Habitability Assessment,” June 2001.

6. Letter from Eric J. Leeds (NRC) to James W. Davis (NEI) dated January 30, 2004, “NEI Draft White Paper, Use of Generic Letter 91-18 Process and Alternate Source Terms in the Context of Control Room Habitability.” (ADAMS Accession No. ML040300694).

BASES

ACTIONS (continued)

MAP-16-205

A.2

Required Action A.2, which only applies if the train cannot be powered from an offsite source, is intended to provide assurance that an event coincident with a single failure of the associated Class 1E GTG will not result in a complete loss of safety function of critical redundant required features. These features are powered from the redundant AC electrical power train. This includes motor driven emergency feedwater pumps. Two train systems, such as turbine driven emergency feedwater pumps, may not be included.

The Completion Time for Required Action A.2 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. One required train has no offsite power supplying it loads and

b. A required feature on the other train (Train A, B, C or D) is inoperable.

If at any time during the existence of Condition A (one offsite circuit inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked. Discovering no offsite power to one required train of the onsite Class 1E Electrical Power Distribution System coincident with one or more inoperable required support or supported features, or both, that are associated with the other train that has offsite power, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining OPERABLE offsite circuit and Class 1E GTGs are adequate to supply electrical power to the onsite Class 1E Distribution System. The 24 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 24 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

BASES

ACTIONS (continued)

A.~~2~~3.1 and A.~~2~~3.2 MAP-16-205

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition A for a period that should not exceed 72 hours. With one offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the unit safety systems. In this Condition, however, the remaining OPERABLE offsite circuit and Class 1E GTGs are adequate to supply electrical power to the onsite Class 1E distribution system.

Required Action A.~~2~~3.2 allows the option to apply the requirements of Specification 5.5.18 to determine a Risk Informed Completion Time (RICT). MAP-16-205

The 72 hour Completion Time takes into account the capacity and capability of the remaining ac sources, a reasonable time for repairs, and the low probability of PA occurring during this period.

B.1

To ensure a highly reliable power source remains with an inoperable Class 1E GTG, it is necessary to verify the availability of the offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action being not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon offsite circuit inoperability, additional Conditions and Required Actions must then be entered.

B.2

Required Action B.2 is intended to provide assurance that a loss of offsite power, during the period that Class 1E GTGs in two trains are inoperable, does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related trains. This includes motor driven emergency feedwater pumps. Two train systems, such as turbine driven emergency feedwater pumps, are not included. Redundant required feature failures consist of inoperable features associated with a train, redundant to the train that has an inoperable Class 1E GTG.

The Completion Time for Required Action B.2 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR has been modified by two Notes. The reason for Note 1 is that during operation with the reactor critical, performance of this SR could cause perturbation to the electrical distribution systems that could challenge continued steady state operation and, as a result, unit safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.

Credit may be taken for unplanned events that satisfy this SR. Note 2 ensures that the Class 1E GTG is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of ≤ 0.9. This power factor ~~is representative of the actual inductive loading~~should be maintained as close as practicable to actual power factor which a Class 1E GTG would see under design basis accident conditions, such as 0.85. Under certain conditions, however, Note 2 allows the Surveillance to be conducted at a power factor other than ≤ 0.9. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to ≤ 0.9 results in voltages on the emergency busses that are too high. Under these conditions, the power factor should be maintained as close as practicable to 0.9 while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the Class 1E GTG excitation levels needed to obtain a power factor of 0.9 may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the Class 1E GTG. In such cases, the power factor shall be maintained as close as practicable to 0.9 without exceeding the Class 1E GTG excitation limits.

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BASES

SURVEILLANCE REQUIREMENTS (continued)

contaminating the entire volume of fuel oil in the storage tanks. These tests are to be conducted prior to adding the new fuel to the storage tank(s), but in no case is the time between receipt of new fuel and conducting the tests to exceed 31 days. The tests, limits, and applicable ASTM Standards are as follows:

a. Sample the new fuel oil in accordance with ASTM D4057-06 (Ref. 6),

b. Verify in accordance with the tests specified in ASTM D975-07b (Ref. 6) that the sample has an absolute specific gravity at 60/60°F of ≥ 0.83 and ≤ 0.89 or an API gravity at 60°F of ≥ 27° and ≤ 39° when tested in accordance with ASTM D1298-99 (Reapproved 2005) (Ref. 6), a kinematic viscosity at 40°C of ≥ 1.9 centistokes and ≤ 4.1 centistokes, and a flash point of ≥ 125°F, and

c. Verify that the new fuel oil has ~~a clear and bright appearance with proper color when tested in accordance with ASTM D4176-04^{E1} or~~ a water and sediment content within limits when tested in accordance with ASTM D2709-96(Reapproved 2006)(Ref. 6). MAP-16-213

Failure to meet any of the above limits is cause for rejecting the new fuel oil, but does not represent a failure to meet the LCO concern since the fuel oil is not added to the storage tanks.

Within 31 days following the initial new fuel oil sample, the fuel oil is analyzed to establish that the other properties specified in Table 1 of ASTM D975-07b (Ref. 7) are met for new fuel oil when tested in accordance with ASTM D975-07b (Ref. 6), except that the analysis for sulfur may be performed in accordance with ASTM D1552-03, ASTM D2622-07, or ASTM D4294-03 (Ref. 6). The 31 day period is acceptable because the fuel oil properties of interest, even if they were not within stated limits, would not have an immediate effect on GTG operation. This Surveillance ensures the availability of high quality fuel oil for the GTGs.

Fuel oil degradation during long term storage shows up as an increase in particulate, due mostly to oxidation. The presence of particulate does not mean the fuel oil will not burn properly in a gas turbine engine. The particulate can cause fouling of filters and fuel oil injection equipment, however, which can cause engine failure.

BASES

REFERENCES

1. FSAR Subsection 9.5.4.

2. Regulatory Guide 1.137, Rev.1, October 1979.

3. ANSI N195-1976, Appendix B.

4. FSAR Chapter 6.

5. FSAR Chapter 15.

6. ASTM Standards: D4057-06; D975-07b; D1298-99 (Reapproved 2005); ~~D4176-04^{E1};~~ D2709-96 (Reapproved 2006); D1552-03; D2622-07; D4294-03; D5452-06. MAP-16-213

7. ASTM Standards, D975-07b, Table 1.