Advanced Passive 1000 (AP1000)
Generic Technical Specification Traveler (GTST)

Title: Changes Related to LCO 3.3.9, Engineered Safety Feature Actuation System (ESFAS) Manual Initiation

I. Technical Specifications Task Force (TSTF) Travelers, Approved Since Revision 2 of STS NUREG-1431, and Used to Develop this GTST

TSTF Number and Title:

TSTF-418-A, Rev 2, RPS and ESFAS Test Times and Completion Times (WCAP-14333)
TSTF-519-T, Rev 0, Increase Standardization in Condition and Required Action Notes

STS NUREGs Affected:

TSTF-418-A, Rev 2: NUREG 1431
TSTF-519-T, Rev 0: NUREG 1430 and 1431

NRC Approval Date:

TSTF-418-A, Rev 2: 02-Apr-03
TSTF-519-T, Rev 0: 16-Oct-09 (TSTF Review)

TSTF Classification:

TSTF-418-A, Rev 2: Technical Change
TSTF-519-T, Rev 0: NUREG Only Change

II. Reference Combined License (RCOL) Standard Departures (Std. Dep.), RCOL COL Items, and RCOL Plant-Specific Technical Specifications (PTS) Changes Used to Develop this GTST

RCOL Std. Dep. Number and Title:

There are no Vogtle Electric Generating Plant Units 3 and 4 (Vogtle or VEGP) departures applicable to GTS 3.3.2.

RCOL COL Item Number and Title:

There are no Vogtle COL items applicable to GTS 3.3.2.

RCOL PTS Change Number and Title:

The VEGP License Amendment Request (LAR) proposed the following changes to the initial version of the PTS (referred to as the current TS by the VEGP LAR). These changes include Administrative Changes (A), Detail Removed Changes (D), Less Restrictive Changes (L), and More Restrictive Changes (M). These changes are discussed in Sections VI and VII of this GTST.

VEGP LAR DOC A028:	Reformat of GTS 3.3.2 into Nine Parts; 3.3.8 through 3.3.16; note that this maps GTS 3.3.2 requirements into interim A028-modified TS (MTS) Subsection 3.3.9, to which the other changes are applied.
VEGP LAR DOC A029:	Revision of MTS 3.3.9 Required Action I.2 statement
VEGP LAR DOC A031:	Revision of Various MTS 3.3.9 Required Action statements
VEGP LAR DOC A033:	Elimination of entries that merely reference other Functions in MTS Table 3.3.8-1
VEGP LAR DOC A034:	Revision of Modes or Other Specified Conditions and footnotes in MTS Table 3.3.9-1
VEGP LAR DOC M02:	Provision for Two or More Inoperable Divisions or Channels
VEGP LAR DOC L12:	Actions related to Functions that result in valve isolation actuations are revised
VEGP LAR DOC L18:	Deletion of MODES 5 and 6 from Containment Isolation – Manual Initiation

III. Comments on Relations Among TSTFs, RCOL Std. Dep., RCOL COL Items, and RCOL PTS Changes

This section discusses the considered changes that are: (1) applicable to operating reactor designs, but not to the AP1000 design; (2) already incorporated in the GTS; or (3) superseded by another change.

TSTF-418-A adjusts the WOG STS (NUREG-1431) required action completion times for the conventional Westinghouse Plant Protection System instrumentation design for which the WOG STS instrumentation requirements are applicable. The changes in TSTF-418 are based on the analysis in WCAP-14333-P, which did not consider the AP1000 protection and safety monitoring system (PMS) instrumentation design. The AP1000 GTS required action completion times (and surveillance frequencies) for the PMS were justified by APP-GW-GSC-020 (WCAP-16787), which is listed as Reference 6 in the GTS Subsection 3.3.2 Bases. APP-GW-GSC-020 does not reference WCAP-14333-P, but notes, “the AP1000 protection and safety monitoring system (PMS) redundancy is as good as or better than that of the conventional Westinghouse Plant Protection System. Although the PMS equipment reliability is considered to be equivalent to or better than that of the conventional Westinghouse Plant Protection System, a common basis for comparison to the digital portion of the PMS is not readily available.”

TSTF-519-T has already been incorporated into the AP1000 GTS regarding the Writer's Guide for Improved Standard Technical Specifications (Reference 4) placement of Notes in TS Actions tables.

IV. Additional Changes Proposed as Part of this GTST (modifications proposed by NRC staff and/or clear editorial changes or deviations identified by preparer of GTST)

The phrase “Passive Core Cooling System” is inserted in front of PXS in the description of ESFAS manual initiation functions 12 and 13 in the APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY section of the Bases for clarity.

Clarifications regarding applicable Functions and Modes are added to the discussion of the Required Actions in the ACTIONS section of the Bases for MTS Required Actions B, D, I, J, K, L, M, and N (STS Required Actions B, D, G, H, I, J, K, and L). In addition, a logical error is corrected in MTS Required Action L (STS Required Action J) to “initiate action to close the RCS boundary” instead of “open.”

Editorial changes are made throughout the Bases to provide consistent instrumentation terminology. Additional minor editorial changes are also implemented throughout the Bases to correct grammar, provide consistency between sections, and improve clarity.

Identify all acronyms at the first occurrence in the Bases discussion.

Added appropriate reference.

APOG Recommended Changes to Improve the Bases

The lead-in to the “ASA, LCO, and Applicability” section of the Bases has a bullet for “Main Feedwater Control Valve Isolation” and refers to LCO 3.3.8 Bases for details. However, the protective functions also include “Main Feedwater Pump Trip and Valve Isolation” as well as “Startup Feedwater Isolation.” These two functions should be included in this list:

- ~~Main~~ Feedwater ~~Control Valve~~ Isolation
  - **Main Feedwater Control Valve Isolation**
  - **Main Feedwater Pump Trip and Valve Isolation**
  - **Startup Feedwater Isolation**

The “ASA, LCO, and Applicability” section of the Bases under the heading “1. Safeguards Actuation – Manual Initiation,” uses the term “ESF.” ESF – Engineered Safety Features – has not been previously defined. Change “ESF” to “Engineered Safety Features (ESF).”

Throughout the Bases, references to Sections and Chapters of the FSAR do not include the “FSAR” clarifier. Since these Section and Chapter references are to an external document, it is appropriate to include the “FSAR” modifier. (DOC A003)

V. Applicability

Affected Generic Technical Specifications and Bases:

Section 3.3.9, Engineered Safety Feature Actuation System (ESFAS) Manual Initiation

Changes to the Generic Technical Specifications and Bases:

GTS 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," is reformatted by DOC A028 into multiple Specifications including interim A028-modified TS (MTS) 3.3.9, "Engineered Safety Feature Actuation System (ESFAS) Manual Initiation." As a result of the reformatting, GTS 3.3.2 Functions 1.a, 2.a, 3.a, 4.a, 6.a (5.a, 7.a, 8.c), 9.a, 10.a, 12.a, 13.a, 16.e (21.b), 17.c, 22.a, 23.a, 29.a, and 31.b are grouped together in MTS 3.3.9 and renumbered as Functions 1 through 15, as shown in the following list. As depicted in Section XI, each MTS 3.3.9 function title includes all of the content of the titles of the associated GTS functions. MTS 3.3.9 Functions 1 through 15 match the numbering of STS Functions 1 through 15. In the following list, only the STS 3.3.9 Function title is given for MTS 3.3.9 Functions 1 through 15. The MTS format is depicted as the reference case in the attached markup in Section XI.

MTS/STS 3.3.9 Function No. & STS Title	GTS 3.3.2 Function(s)
1. Safeguards Actuation – Manual Initiation	1. Safeguards Actuation a. Manual Initiation
2. Core Makeup Tank Actuation – Manual Initiation	2. Core Makeup Tank (CMT) Actuation a. Manual Initiation
3. Containment Isolation – Manual Initiation	3. Containment Isolation a. Manual Initiation
4. Steam Line Isolation – Manual Initiation	4. Steam Line Isolation a. Manual Initiation
5. Feedwater Isolation – Manual Initiation	5. Turbine Trip a. Manual Main Feedwater Isolation 6. Main Feedwater Control Valve Isolation a. Manual Initiation 7. Main Feedwater Pump Trip and Valve Isolation a. Manual Initiation 8. Startup Feedwater Isolation c. Manual Initiation
6. ADS Stages 1, 2 & 3 Actuation – Manual Initiation	9. ADS Stages 1, 2 & 3 Actuation a. Manual Initiation
7. ADS Stage 4 Actuation – Manual Initiation	10. ADS Stage 4 Actuation a. Manual Initiation Coincident with RCS Wide Range Pressure – Low, or ADS Stages 1, 2 & 3 Actuation

MTS/STS 3.3.9 Function No. & STS Title	GTS 3.3.2 Function(s)
8. Passive Containment Cooling Actuation – Manual Initiation	12. Passive Containment Cooling Actuation a. Manual Initiation
9. Passive Residual Heat Removal Heat Exchanger Actuation – Manual Initiation	13. Passive Residual Heat Removal Heat Exchanger Actuation a. Manual Initiation
10. Chemical Volume and Control System Makeup Isolation – Manual Initiation	16. Chemical Volume and Control System Makeup Isolation e. Manual Initiation 21. Auxiliary Spray and Purification Line Isolation b. Manual Initiation
11. Normal Residual Heat Removal System Isolation – Manual Initiation	17. Normal Residual Heat Removal System Isolation c. Manual Initiation
12. In-Containment Refueling Water Storage Tank (IRWST) Injection Line Valve Actuation – Manual Initiation	22. In-Containment Refueling Water Storage Tank (IRWST) Injection Line Valve Actuation a. Manual Initiation
13. IRWST Containment Recirculation Valve Actuation – Manual Initiation	23. IRWST Containment Recirculation Valve Actuation a. Manual Initiation
14. SG Power Operated Relief Valve and Block Valve Isolation – Manual Initiation	29. SG Power Operated Relief Valve and Block Valve Isolation a. Manual Initiation
15. Containment Vacuum Relief Valve Actuation – Manual Initiation	31. Containment Vacuum Relief Valve Actuation b. Manual Initiation

References 2, 3, and 6 provide details showing the correspondence of GTS 3.3.2 Functions and STS 3.3.8 through 3.3.16 Functions.

GTS 3.3.2 Conditions A, E, G, N, O, Q, R, S, U, X, Y, and CC are reordered and relabeled as MTS 3.3.9 Conditions A through N and as changed become STS 3.3.9 Conditions A through L, as follows (applicability footnote references are listed). (DOC A028).

GTS	MTS	STS	STS 3.3.9 Functions [Applicable MODES (footnote)]		
A, E	A	A	1 [1,2,3,4]	2 [1,2,3,4(a),4(b),5(c)]	3 [1,2,3,4]
A, E	A	A	4 [1,2,3,4]	5 [1,2,3,4]	6 [1,2,3,4]
A, E	A	A	7 [1,2,3,4]	8 [1,2,3,4]	9 [1,2,3,4,5(c)]
A, E	A	A	10 [1,2,3,4(a)]	11 [1,2,3]	12 [1,2,3,4(a)]
A, E	A	A	13 [1,2,3,4(a)]	14 [1,2,3,4(a)]	15 [1,2,3,4,5(g),6(g)]
A, G	B	B	1 [5]	6 [5(d)]	7 [5,6(e)]
A, G	B	B	8 [5(f),6(f)]	12 [4(b),5,6]	13 [4(b),5,6]

GTS	MTS	STS	STS 3.3.9 Functions [Applicable MODES (footnote)]		
A	C	C	1 [1,2,3,4,5]	2 [1,2,3,4(a),4(b),5(c)]	3 [1,2,3,4]
A	C	C	4 [1,2,3,4]	5 [1,2,3,4]	6 [1,2,3,4,5(d)]
A	C	C	7 [1,2,3,4,5,6(e)]	8 [1,2,3,4,5(f),6(f)]	9 [1,2,3,4,5(c)]
A	C	C	10 [1,2,3,4(a)]	11 [1,2,3]	12 [1,2,3,4,5,6]
A	C	C	13 [1,2,3,4,5,6]	14 [1,2,3,4]	15 [1,2,3,4,5(g),6(g)]
N	D	D	2 [1,2,3,4(a)]	12 [1,2,3,4(a)]	13 [1,2,3,4(a)]
N	D	D	14 [1,2,3,4(a)]		
O	E	E	1 [1,2,3,4]	3 [1,2,3,4]	6 [1,2,3,4]
O	E	E	7 [1,2,3,4]	8 [1,2,3,4]	9 [1,2,3,4]

For STS 3.3.9 Functions 4, 5, 10, and 11, STS 3.3.9 Condition F replaces GTS 3.3.2 Conditions Q, R, and S (MTS 3.3.9 Conditions F, G, and H) (DOC L12):

GTS	MTS	STS	STS 3.3.9 Functions [Applicable MODES (footnote)]		
Q	F	F	11 [1,2,3]		
R	G	F	10 [1,2,3,4(a)]		
S	H	F	4 [1,2,3,4]	5 [1,2,3,4]	
U	I	G	2 [4(b),5(c)]	9 [5(c)]	
X	J	H	6 [5(d)]7 [5]		
X	J	--	GTS 3.3.2 Function 9a [6(j,k)] / MTS 3.3.9 Function 6 [6(f,g)] is deleted (DOC A034)		
X	K	I	7 [6(e)]		
Y	L	J	1 [5]	8 [5(f)]	12 [4(b),5]
Y	L	J	13 [4(b),5]		
Y	L	--	GTS 3.3.2 Function 3a [5(e),6(e)] / MTS 3.3.9 Function 3 [5(d),6(d)] is deleted (DOC L18)		
Y	M	K	8 [6(f)] 12 [6] 13 [6]		
CC	N	L	15 [1,2,3,4,5(g),6(g)]		

GTS Table 3.3.2-1 footnotes b, c, d, e, h, k, f, j, and r, are reordered and relabeled as MTS Table 3.3.9-1 footnotes a through i and as changed becomes STS Table 3.3.9-1, footnotes a through g, as follows:

GTS	MTS	STS	STS Table 3.3.9-1 footnote or deleted GTS Table 3.3.2-1 footnote
(b)	(a)	(a)	With the RCS not being cooled by the Normal Residual Heat Removal System (RNS).
(c)	(b)	(b)	With the RCS being cooled by the RNS.
(d)	(c)	(c)	With the RCS pressure boundary intact.
(e)	(d)	---	Not applicable for valve isolation Functions whose associated flow path is isolated. (STS 3.3.9 Functions 3, 5, 10, 11) (deleted) (DOC L12)
---	---	(d)	With RCS pressure boundary intact and with pressurizer level ≥ 20%.
(h)	(e)	---	Not applicable if all MSIVs are closed. (STS 3.3.9 Function 4) (deleted) (DOC L12)

GTS	MTS	STS	STS Table 3.3.9-1 footnote or *deleted GTS Table 3.3.2-1 footnote*
(j)	(f)	---	Not applicable when the required ADS valves are open. See LCO 3.4.12 and LCO 3.4.13 for ADS valve and equivalent relief area requirements. (STS 3.3.9 Functions 6, 7) (deleted) (DOC A034)
(k)	(g)	(e)	With upper internals in place.
(f)	(h)	(f)	With decay heat > 6.0 MWt.
(r)	(i)	(g)	Without an open containment air flow path ≥ 6 inches in diameter.

MTS Table 3.3.9-1 footnote (d) is deleted, which affects the applicability of MTS Table 3.3.9-1 Functions 3, 5, 10, and 11 (GTS Table 3.3.2-1 Functions 3.a, 6.a, 16.e, and 17.c). (DOC A028)

MTS Table 3.3.9-1 footnotes (e) and (f) are eliminated, which affects the applicability of MTS 3.3.9 Functions 4, 6, and 7 (GTS Table 3.3.2-1 Functions 4.a, 9.a, and 10.a). (DOC A034)

STS Table 3.3.9-1 footnote (d) is added; it states “With RCS pressure boundary intact and with pressurizer level ≥ 20%.” It applies to STS 3.3.9 Function 6 in Mode 5. One can also view this added footnote as a combination of GTS footnotes (d) and (l). (DOC A034)

GTS SR 3.3.2.3 is retained and renumbered as MTS SR 3.3.9.1.

MTS 3.3.9 Condition C is revised by adding a second condition statement for the condition “one or more Functions with two channels inoperable.” Otherwise, LCO 3.0.3 would apply when the LCO is not met and the associated Actions are not met or an associated Action is not provided. (DOC M02)

MTS 3.3.9 Conditions F, G, and H, which are related to MTS 3.3.9 Functions 4, 5, 10, and 11 that result in valve isolation actuations, specify inconsistent required actions for inoperable manual instrumentation channels of such instrument functions. These inconsistencies are removed by revising the associated action requirements and applicability footnotes in MTS Table 3.3.9-1, as follows (DOC L12):

MTS 3.3.9 Conditions F, G, and H, which are related to Functions that result in valve isolation actuations and which specify required actions to isolate affected flow paths are replaced by STS 3.3.9 Condition F. Required Action F.1 requires immediately declaring affected isolation valves inoperable. Condition F applies to STS 3.3.9 Functions 4, 5, 10, and 11. (DOC L12)

STS 3.3.9 Function No. and Title		STS Actuated System LCO - ACTIONS	Function No. - ACTION GTS 3.3.2	MTS 3.3.9	STS 3.3.9
4.	Steam Line Isolation - Manual Initiation	3.7.2 - A, B, C, D, E, F	4a - S	4 - H	4 - F
5.	Feedwater Isolation - Manual Initiation	3.7.3 - A, B, C 3.7.7 - A, B, C	6a (5a, 7a) - S 6a (8c) - S	5 - H 5 - H	5 - F 5 - F
10.	Chemical and Volume Control System Makeup Isolation - Manual Initiation	3.1.9 - A, B	16e - R	10 - G	10 - F
11.	Normal Residual Heat Removal System Isolation - Manual Initiation	3.6.3 - A, B, C	17c - Q	11 - F	11 - F

MTS 3.3.9 Required Action I.2 is revised to delete the phrase “and establish a pressurizer level ≥ 20%.” The action to establish a pressurizer level ≥ 20% ceases to be applicable once the RCS pressure boundary is open as required by the first part of MTS 3.3.9 Required Action I.2 (STS 3.3.9 Required Action G.2). (DOC A029)

MTS 3.3.9 Required Action J.2 lead in phrase “If in MODE 5 with RCS open and < 20% pressurizer level” is deleted. MTS Table 3.3.9-1 footnote and Mode revisions make this phrase unnecessary. (DOC A034)

MTS 3.3.9 Required Action J.2 phrase is revised from “initiate action to be in MODE 5 with RCS open and ≥ 20% pressurizer level,” to “Initiate action to open RCS pressure boundary and establish ≥ 20% pressurizer level.” This change is made for clarity and consistency. (DOC A031)

MTS 3.3.9 Required Action K.2 lead in phrase “If in MODE 6 with upper internals in place” is deleted. MTS Table 3.3.9-1 footnote and Mode revisions make this phrase unnecessary. (DOC A034)

MTS 3.3.9 Required Action K.2 phrase is revised from “initiate action to be in MODE 6 with the upper internals removed,” to “Initiate action to remove the upper internals.” This change is made for clarity and consistency. (DOC A031)

MTS 3.3.9 Required Action M.2 phrase is revised from “initiate action to be in MODE 6 with the water level ≥ 23 feet above the top of the reactor vessel flange,” to “Initiate action to establish water level ≥ 23 feet above the top of the reactor vessel flange.” This change is made for clarity and consistency. (DOC A031)

MTS Table 3.3.9-1, Function 3, Containment Isolation – Manual Initiation, is revised to delete Modes 5(d) and 6(d) from the Applicability. Manual closure capability is acceptable for the equipment hatches, air lock doors, and containment spare penetrations in these Modes. (DOC L18)

The title of MTS Table 3.3.9-1 Function 5 is revised to “Feedwater Isolation – Manual Initiation” for clarity. (DOC A033)

The following tables are provided as an aid to tracking the various changes to GTS 3.3.2 Conditions, Required Actions, Functions, Applicability Footnotes, and Surveillance Requirements that result in interim A028-modified TS (MTS) 3.3.9, and as further changed, STS 3.3.9.

Changes to Conditions

GTS 3.3.2 Condition	MTS 3.3.9 Condition	STS 3.3.9 Condition	Other STS Subsections Addressing the Listed Condition	Additional Changes DOC Number
A	C	C	3.3.8, 3.3.10	M02
B	→	→	3.3.8	---
C	→	→	3.3.10	---
D	→	→	3.3.12, 3.3.15	---
A, E	A	A	---	---
F	→	→	3.3.13	---
A, G	B	B	3.3.13, 3.3.16	---
H	→	→	3.3.11, 3.3.14	---
I	→	→	3.3.8	---
J	→	→	3.3.8	---
K	→	→	3.3.13	---
L	→	→	3.3.8	---
M	→	→	3.3.8, 3.3.12	---
N	D	D	3.3.8, 3.3.11	---
O	E	E	3.3.8, 3.3.13, 3.3.15	---

GTS 3.3.2 Condition	MTS 3.3.9 Condition	STS 3.3.9 Condition	Other STS Subsections Addressing the Listed Condition	Additional Changes DOC Number
P	→	→	3.3.8, 3.3.14	---
Q	F	F	3.3.8, 3.6.3	L12
R	G	F	3.3.8, 3.1.9	L12
S	H	F	3.3.8, 3.7.3	L12
T	→	→	3.3.8	---
U	I	G	---	A029
V	→	→	3.3.8	---
W	→	→	3.3.16	---
GTS 3.3.2 Condition X actions are split between two Conditions in STS 3.3.9				
X	J	H	3.3.8	A031 A034
X	K	I	3.3.8	A031 A034
GTS 3.3.2 Condition Y actions are split between two Conditions in STS 3.3.9				
Y	L	J	3.3.8, 3.3.10	---
Y	M	K	3.3.8, 3.3.10	A031
Z	→	→	3.3.8	L12
AA	→	→	3.3.10	---
BB	→	→	3.3.10	---
CC	N	L	---	---

Changes to Functions (a complete function list appears in GTST AP1000-O61-3.3.8)

----------Function [Modes(footnote)] ----------			STS 3.3.9		Additional
GTS 3.3.2	MTS 3.3.9	STS 3.3.9	Conditions	Additional Changes	DOC Changes
1.a [1,2,3,4]	1 [1,2,3,4]	1 [1,2,3,4]	A, C, E	---	M02
1.a [5]	1 [5]	1 [5]	B, C, J	---	M02
2.a [1,2,3,4(b)]	2 [1,2,3,4(a)]	2 [1,2,3,4(a)]	A, C, D	---	M02
2.a [4(c),5(d)]	2 [4(b),5(c)]	2 [4(b),5(c)]	A, C, G	---	M02
3.a [1,2,3,4]	3 [1,2,3,4]	3 [1,2,3,4]	A, C, E	---	M02
3.a [5(e),6(e)]	3 [5(d),6(d)]	---	---	Deleted	L18
4.a [1,2(h),3(h),4(h)]	4 [1,2(e),3(e),4(e)]	4 [1,2,3,4]	A, C, F	---	M02 L12
5.a [1,2]	---	5 [1,2,3,4]	A, C, F	Combined with 6.a	A033
6.a [1,2,3,4(e)]	5 [1,2,3,4(d)]	5 [1,2,3,4]	A, C, F	---	A033 M02 L12
7.a [1,2,3,4(e)]	---	5 [1,2,3,4]	A, C, F	Combined with 6.a	A033
8.c [1,2,3,4(e)]	---	5 [1,2,3,4]	A, C, F	Combined with 6.a	A033
9.a [1,2,3,4]	6 [1,2,3,4]	6 [1,2,3,4]	A, C, E	---	M02
9.a [5(e)]	6 [5(d)]	6 [5(d)]	B, C, H	MTS footnote (d) deleted STS footnote (d) added	A031 A034 M02
9.a [6(j,k)]	6 [6(f,g)]	---	---	Deleted	A034
10.a [1,2,3,4]	7 [1,2,3,4]	7 [1,2,3,4]	A, C, E	---	A033 M02
10.a [5(j)]	7 [5(f)]	7 [5]	B, C, H	---	A031 A033 A034 M02
10.a [6(j,k)]	7 [6(f,g)]	7 [6(e)]	B, C, I	---	A031 A033 A034 M02
12.a [1,2,3,4]	8 [1,2,3,4]	8 [1,2,3,4]	A, C, E	---	M02
12.a [5(f)]	8 [5(h)]	8 [5(f)]	B, C, J	---	M02
12.a [6(f)]	8 [6(h)]	8 [6(f)]	B, C, K	---	A031 M02
13.a [1,2,3,4]	9 [1,2,3,4]	9 [1,2,3,4]	A, C, E	---	M02
13.a [5(d)]	9 [5(c)]	9 [5(c)]	A, C, G	---	M02
16.e [1,2,3(e),4(b,e)]	10 [1,2,3(d),4(a,d)]	10 [1,2,3,4(a)]	A, C, F	---	A033 M02 L12
17.c [1,2,3(e)]	11 [1,2,3(d)]	11 [1,2,3]	A, C, F	---	M02 L12
21.b [1,2]	---	10 [1,2,3,4(a)]	A, C, F	Combined with 16.e	A033
22.a [1,2,3,4(b)]	12 [1,2,3,4(a)]	12 [1,2,3,4(a)]	A, C, D	---	M02
22.a [4(c),5]	12 [4(b),5]	12 [4(b),5]	B, C, J	---	M02
22.a [6]	12 [6]	12 [6]	B, C, K	---	A031 M02
23.a [1,2,3,4(b)]	13 [1,2,3,4(a)]	13 [1,2,3,4(a)]	A, C, D	---	M02
23.a [4(c),5]	13 [4(b),5]	13 [4(b),5]	B, C, J	---	M02
23.a [6]	13 [6]	13 [6]	B, C, K	---	A031 M02
29.a [1,2,3,4(b)]	14 [1,2,3,4(a)]	14 [1,2,3,4(a)]	A, C, D	---	M02
31.b [1,2,3,4]	15 [1,2,3,4]	15 [1,2,3,4]	A, C, L	---	M02
31.b [5(r),6(r)]	15 [5(i),6(i)]	15 [5(g),6(g)]	A, C, L	---	M02

Changes to Applicability Footnotes

GTS 3.3.2 Footnote	MTS 3.3.9 Footnote	STS 3.3.9 Footnote	STS 3.3.9 Function	STS Subsections Also Addressing Listed footnote	Additional Changes DOC Number
a	→	→	→	3.3.8	---
b	a	a	2, 10, 12, 14	3.3.8, 3.3.9	---
c	b	b	2, 12, 13	3.3.8, 3.3.9, 3.3.10	---
d	c	c	2, 9	3.3.8, 3.3.9	---
e	d	Eliminated	----	3.3.8, 3.3.9	L12 L18

GTS 3.3.2 Footnote	MTS 3.3.9 Footnote	STS 3.3.9 Footnote	STS 3.3.9 Function	STS Subsections Also Addressing Listed footnote	Additional Changes DOC Number
f	h	f	8	3.3.8, 3.3.9	---
g	→	→	→	3.3.8	---
h	e	Eliminated	----	3.3.8, 3.3.9	L12
i	→	→	→	3.3.8	---
j	f	Eliminated	----	3.3.8, 3.3.9, 3.3.10	A034
k	g	e	7	3.3.8, 3.3.9, 3.3.10	A034
l	→	→	→	3.3.8	---
m	→	→	→	3.3.8	---
n	→	→	→	3.3.8	---
o	→	→	→	3.3.13	---
p	→	→	→	3.3.10	---
q	→	→	→	3.3.10	---
r	i	g	15	3.3.8	---
---	---	d	6	---	A031 A034

Changes to Surveillance Requirements

GTS 3.3.2 SR	MTS 3.3.9 SR	STS 3.3.9 SR	STS Subsections Also Addressing the Listed SR	Example Surveillance No. Surveillance Description
3.3.2.1	→	→	3.3.8, 3.3.10, 3.3.11, 3.3.13, 3.3.14	3.3.8.1 CHANNEL CHECK
3.3.2.2	→	→	3.3.15, 3.3.16	3.3.15.1 ACTUATION LOGIC TEST
3.3.2.3	3.3.9.1	3.3.9.1	3.3.12	3.3.9.1 TRIP ACTUATING DEVICE OPERATIONAL TEST
3.3.2.4	→	→	3.3.8, 3.3.10, 3.3.11, 3.3.13, 3.3.14	3.3.8.3 CHANNEL CALIBRATION
3.3.2.5	→	→	3.3.8, 3.3.10, 3.3.11, 3.3.13, 3.3.14	3.3.8.2 CHANNEL OPERATIONAL TEST
3.3.2.6	→	→	3.3.8, 3.3.10, 3.3.11, 3.3.13, 3.3.14	3.3.8.4 ESF RESPONSE TIME
3.3.2.7	→	→	3.3.8, 3.1.9, 3.5.2, 3.5.4, 3.5.6, 3.6.10, 3.7.7	ACTUATION DEVICE TEST*
3.3.2.8	→	→	3.3.8, 3.4.11, 3.4.13	Squib Valve ACTUATION DEVICE TEST
3.3.2.9	→	→	3.3.15, 3.3.16	Pressurizer Heater ACTUATION DEVICE TEST

* Typically, the associated STS system specification or STS 3.3.15 or 3.3.16, will include a SR for the actuation device, as follows: “Verify [tested required component] actuates to the [required position or state] on an actual or simulated actuation signal.” Such SRs overlap with the Actuation Logic Test for complete testing of the actuation device. (DOC L01)

The bullet list in the lead-in to the “ASA, LCO, and Applicability” section of the Bases is revised to provide better accuracy. (APOG Comment and NRC Staff Edit)

The “ASA, LCO, and Applicability” section of the Bases under the heading “1. Safeguards Actuation – Manual Initiation,” is revised for consistency. (APOG Comment)

The acronym “FSAR” is added to modify “Section” and “Chapter” in references to the FSAR throughout the Bases. (DOC A003) (APOG Comment)

VI. Traveler Information

Description of TSTF changes:

Not Applicable

Rationale for TSTF changes:

Not Applicable

Description of changes in RCOL Std. Dep., RCOL COL Item(s), and RCOL PTS Changes:

The Vogtle Electric Generating Plant Units 3 and 4 (VEGP) technical specifications upgrade (TSU) License Amendment Request (VEGP TSU LAR) (Reference 2) proposed changes to the initial version of the VEGP PTS (referred to as the current TS by the VEGP TSU LAR). As detailed in VEGP TSU LAR Enclosure 1, administrative change number 28 (DOC A028) reformats PTS 3.3.2 into multiple Specifications as follows:

- 3.3.8, “Engineered Safety Feature Actuation System (ESFAS) Instrumentation,”
- 3.3.9, “Engineered Safety Feature Actuation System (ESFAS) Manual Initiation,”
- 3.3.10, “Engineered Safety Feature Actuation System (ESFAS) Reactor Coolant System (RCS) Hot Leg Level Instrumentation,”
- 3.3.11, “Engineered Safety Feature Actuation System (ESFAS) Startup Feedwater Flow Instrumentation,”
- 3.3.12, “Engineered Safety Feature Actuation System (ESFAS) Reactor Trip Initiation,”
- 3.3.13, “Engineered Safety Feature Actuation System (ESFAS) Control Room Air Supply Radiation Instrumentation,”
- 3.3.14, “Engineered Safety Feature Actuation System (ESFAS) Spent Fuel Pool Level Instrumentation,”
- 3.3.15, “Engineered Safety Feature Actuation System (ESFAS) Actuation Logic – Operating,” and
- 3.3.16, “Engineered Safety Feature Actuation System (ESFAS) Actuation Logic – Shutdown.”

Since PTS 3.3.2, “Engineered Safety Feature Actuation System (ESFAS) Instrumentation,” is identical to GTS 3.3.2, it is appropriate for this GTST to consider the proposed changes to PTS 3.3.2 as changes to GTS 3.3.2 for incorporation in AP1000 STS 3.3.9. DOC A028 is extensive, but retains the intention of PTS 3.3.2 while improving operational use of the TS. The numerous Functions, Conditions and extensive bases discussion associated with PTS 3.3.2 are repackaged into nine smaller parts. Therefore, the changes implemented by DOC A028 are presented in the Subsection 3.3.9 markup in Section XI of this GTST as the “clean” starting point and are identified as interim A028-modified TS (MTS) 3.3.9. The specific details of the reformatting for MTS 3.3.9 can be found in VEGP TSU LAR (Reference 2), in Enclosure 2 (markup) and Enclosure 4 (clean). The NRC staff safety evaluation regarding DOC A028 can be found in Reference 3, VEGP LAR SER. The VEGP TSU LAR was modified in response to NRC staff RAIs in Reference 5 and the Southern Nuclear Operating Company RAI Response in Reference 6.

DOC A029 revises MTS 3.3.9 Required Action I.2 by deleting “and establish a pressurizer level ≥ 20%.”

DOC A031 revises MTS 3.3.9 as follows:

Required Action J.2 from “… initiate action to be MODE 5 with RCS open and ≥ 20% pressurizer level,” to “Initiate action to open RCS pressure boundary and establish ≥ 20% pressurizer level.”

Required Action K.2 is revised from “… initiate action to be in MODE 6 with the upper internals removed,” to “Initiate action to remove the upper internals.”

Required Action M.2 is revised from “… initiate action to be in MODE 6 with the water level ≥ 23 feet above the top of the reactor vessel flange,” to “Initiate action to establish water level ≥ 23 feet above the top of the reactor vessel flange.”

DOC A033 revises the title of MTS Table 3.3.9-1 Function 5 to “Feedwater Isolation – Manual Initiation.”

DOC A034 deletes the following lead-in phrases in the following MTS 3.3.9 Required Actions:

J.2 “If in MODE 5 with RCS open and < 20% pressurizer level”

K.2 “If in MODE 6 with upper internals in place”

MTS Table 3.3.9-1 footnote (d) is eliminated from the Applicability of MTS 3.3.9 Functions 3, 5, 10, and 11.

STS Table 3.3.9-1 footnote (d) is added to the Mode 5 Applicability of MTS 3.3.9 Function 6, ADS Stages 1, 2 & 3 Actuation – Manual Initiation; it states “With RCS pressure boundary intact and with pressurizer level ≥ 20%.”

DOC M02 addresses the fact that MTS 3.3.9, “Engineered Safety Feature Actuation System (ESFAS) Manual Initiation,” does not specify Actions for the inoperability of two manual initiation channels with one or more Functions. This results in entry into LCO 3.0.3 when three or more channels are inoperable.

DOC L12 revises Actions related to Functions that result in valve isolation actuations. MTS 3.3.9 Actions F, G, and H (GTS 3.3.2 Actions Q, R, and S), are revised to “Declare affected isolation valve(s) inoperable.” MTS Table 3.3.9-1 footnotes (d) and (e) (GTS Table 3.3.2-1 footnotes (e) and (h)) are deleted.

DOC L18 removes requirements for operable containment isolation signals in Modes 5 and 6, allowing manual operator actions to affect any required isolation prior to steaming into the containment. This change affects MTS 3.3.9 Function 3.

A more detailed description of the changes by each of the above DOCs can be found in Reference 2, VEGP TSU LAR in Enclosure 1; the NRC staff safety evaluation can be found in Reference 3, VEGP LAR SER. The VEGP TSU LAR was modified in response to NRC staff RAIs (Reference 5) by Southern Nuclear Operating Company’s RAI Response in Reference 6.

Rationale for changes in RCOL Std. Dep., RCOL COL Item(s), and RCOL PTS Changes:

The reformatting per DOC A028, except where addressed in other DOCs, addresses inconsistencies in formatting and approach between PTS 3.3.1 and PTS 3.3.2, respectively. Simplification and clarification are proposed for each Specification. In breaking down each PTS Specification into specific subsets of the Protection and Safety Monitoring System (PMS) function, improved human factored operator usability results.

These improvements also reflect the general approach currently in use in the Improved Standard Technical Specifications (STS) for Babcock and Wilcox Plants, NUREG-1430, Rev. 4. That is to separate the functions for [sensor] instrumentation, Manual Actuation, Trip/Actuation Logic, and Trip Actuation Devices (e.g., Reactor Trip Breakers (RTBs)) into separate Specification subsections. Furthermore, the Actions for some ESFAS Functions generally involve a more complex presentation than needed for other Functions, such that simple common Actions are not reasonable. Such Functions are also provided with separate Specification subsections.

When TS instrument function tables are utilized to reference Actions, the generally preferred format of the Actions for an instrumentation Specification in NUREG-1430 is to provide the initial Actions that would be common to all of the specified functions (typically for bypassing and/or tripping one or two inoperable channels), then the “default” Action would direct consulting the function table for follow-on Actions applicable to the specific affected function. These follow-up Actions generally reflect the actions to exit the Applicability for that function.

This format also allows splitting the default Actions from the initial preferred actions. This general approach is the standard format for other Specifications and for Instrumentation Specifications for other vendors’ Improved STS.

DOC A029 clarifies the applicability of the action to establish a pressurizer level ≥ 20% once the RCS pressure boundary is open in MTS 3.3.9 Required Action I.2 (GTS 3.3.2 Required Action U.2; STS 3.3.9 Required Action G.2).

DOC A031 is consistent with the TS Writer's Guide (Reference 4).

DOC A033 acknowledges that DOC A028 revises GTS subsection 3.3.2, including Table 3.3.2-1, by breaking the subsection into nine subsections corresponding to specific subsets of the Protection and Safety Monitoring System (PMS) function. The referencing of another instrument function by a duplicate listing of that function in GTS Table 3.3.2-1, in order to specify, without repetition, the requirements for that function, is not necessary with the revised format for ESFAS instrumentation in the AP1000 STS; therefore, such reference statements for duplicate listings of instrument functions may be deleted.

DOC A034 acknowledges that DOC A028 revises GTS subsection 3.3.2, including Table 3.3.2-1, by breaking the subsection into nine subsections corresponding to specific subsets of the PMS function. This reformatting entails combining function table applicability footnotes and removing Condition and Required Action lead-in phrases that reference a specific operational mode or applicability condition in order to establish context for the action requirement. Such phrases are no longer necessary to establish context for the Action because the Actions table has been suitably revised to make the context of each action requirement clear.

DOC M02 directly provides for the default Actions of LCO 3.0.3 without allowing for the additional hour that LCO 3.0.3 permits prior to initiating shutdown. This provides clarity for the operator and is more restrictive than LCO 3.0.3.

DOC L12 notes that MTS 3.3.2 Conditions F, G, and H, which are related to MTS 3.3.9 Functions 4, 5, 10, and 11 that result in valve isolation actuations, specify inconsistent required actions for inoperable manual instrumentation channels of such instrument functions. These inconsistencies result in increased complexity and introduce an increased potential for operator confusion and misapplication. These inconsistencies are removed by revising the associated action requirements and applicability footnotes in MTS Table 3.3.9-1.

DOC L18 acknowledges that the equipment hatches, air lock doors, and containment spare penetrations may be open in MODES 5 and 6. There is no manual initiation Function for containment isolation for these large openings because closing these larger penetrations may involve more protracted procedures. Manual closure of these large containment isolations is acceptable provided they can be closed prior to steaming into the containment. This allowance is extended to penetration flow paths with isolation valves that provide direct connection between the atmosphere inside containment and the atmosphere outside containment.

Description of additional changes proposed by NRC staff/preparer of GTST:

All acronyms are identified at the first occurrence in the Bases discussion.

The phrase “Passive Core Cooling System” is inserted in front of PXS in the description of ESFAS manual initiation functions 12 and 13 in the APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY section of the Bases for clarity.

Clarifications regarding applicable Functions and Modes are added to the discussion of the Required Actions in the ACTIONS section of the Bases for MTS Actions B, D, I, J, K, L, M, and N (STS Actions B, D, G, H, I, J, K, and L). In addition, a logical error is corrected in MTS Action L (STS Action J) to “initiate action to close the RCS boundary” instead of “open.”

The “Main Feedwater Pump Trip and Valve Isolation” bullet in the lead-in to the “ASA, LCO, and Applicability” section of the Bases is revised to state:

- ~~Main~~ Feedwater ~~Control Valve~~ Isolation
  - **Main Feedwater Control Valve Isolation**
  - **Main Feedwater Pump Trip and Valve Isolation**
  - **Startup Feedwater Isolation** (APOG Comment and NRC Staff Edit)

The acronym “ESF” in the “ASA, LCO, and Applicability” section of the Bases under the heading “1. Safeguards Actuation – Manual Initiation,” is revised to “Engineered Safety Features (ESF).”

The acronym “FSAR” is added to modify “Section” and “Chapter” in references to the FSAR throughout the Bases. (DOC A003) (APOG Comment)

Rationale for additional changes proposed by NRC staff/preparer of GTST:

Provide additional clarifying discussion in the Bases only.

The bullet list in the lead-in to the “ASA, LCO, and Applicability” section of the Bases is revised to provide better accuracy.

The non-technical change to the “ASA, LCO, and Applicability” section of the Bases under the heading “1. Safeguards Actuation – Manual Initiation,” provides consistency.

Since Bases references to FSAR Sections and Chapters are to an external document, it is appropriate to include the “FSAR” modifier.

VII. GTST Safety Evaluation

Technical Analysis:

DOC A029, Revision of GTS 3.3.9 Required Action U.2 Statement

DOC A029 revises GTS 3.3.2 Required Action U.2 (MTS 3.3.9 Required Action I.2), which requires initiating action to open the RCS pressure boundary and establish a pressurizer level ≥ 20% within 12 hours, by deleting the phrase “and establish a pressurizer level ≥ 20%.”

GTS 3.3.2 Required Action U.1 requires placing the unit in Mode 5 within 12 hours, thus exiting the Mode 4 applicability of the LCO for:

> GTS 3.3.2 Function 2.a (MTS/STS 3.3.9 Function 2), CMT Actuation – Manual Initiation, which is applicable in Mode 4 with the RCS being cooled by the RNS, and in Mode 5 with the RCS pressure boundary intact; and
>
> GTS 3.3.2 Function 13.a (MTS/STS 3.3.9 Function 9), Passive Residual Heat Removal Heat Exchanger (PRHR HX) Actuation – Manual Initiation, which is applicable in Mode 4, and in Mode 5 with the RCS pressure boundary intact.

GTS LCO 3.0.1 and LCO 3.0.2 establish that Actions are applicable during the Modes or other Specified Conditions in which the LCO must be met. Therefore, the action to establish a pressurizer level ≥ 20% ceases to be applicable once the RCS pressure boundary is open as required by the first part of Required Action U.2. Therefore, the deletion of the portion of Required Action U.2 that states “establish a pressurizer level ≥ 20%,” results in no operational difference from the GTS Action, and is an administrative change. In addition, with the RCS pressure boundary open, the PRHR HX cannot operate; so there is no need to maintain pressurizer level ≥ 20% to support PRHR HX operation. Therefore, the revised GTS 3.3.2 Required Action U.2, renumbered as STS 3.3.9 Required Action G.2, is acceptable.

DOC M02, Provision for Two Inoperable Manual Initiation Channels

AP1000 GTS LCO 3.0.3 is only applicable in MODES 1, 2, 3, and 4, and states:

> When an LCO is not met and the associated ACTIONS are not met, an associated ACTION is not provided, or if directed by the associated ACTIONS, the unit shall be placed in a MODE or other specified condition in which the LCO is not applicable. Action shall be initiated within 1 hour to place the unit, as applicable,
>
> a. MODE 3 within 7 hours; and
> b. MODE 4 within 13 hours; and
> c. MODE 5 within 37 hours.

GTS 3.3.1 and 3.3.2 Functions with applicability statements that include MODE 1, 2, 3, or 4, generally have no Actions specified for addressing a loss of function condition, such as when all required channels are inoperable. Upon discovery of such a condition, LCO 3.0.3 would apply. The intent of LCO 3.0.3 (as stated in the TS Bases) is to “impose time limits for placing the unit in a safe MODE or other specified condition when operation cannot be maintained within the limits for safe operation as defined by the LCO and its ACTIONS.”

The Actions for inoperable RTS and ESFAS instrumentation provide restoration time and/or compensatory action allowances (e.g., place the inoperable channel in trip); but only for inoperability of some of the channels (e.g., 1 or 2 out of 4 required channels, typically). If these restoration and/or compensatory actions cannot be met in the required time, “default” actions are provided, which are designed to place the unit in a safe MODE or other specified condition – typically, actions that result in exiting the Applicability for that Function.

The shutdown actions of LCO 3.0.3 are typical of “default” actions throughout the TS that direct plant shutdown to exit the Applicability, with the exception that LCO 3.0.3 includes an additional 1 hour before the shutdown is required to be initiated.

The revisions described in DOC M02 address multiple-channel inoperability. The revisions will immediately impose the “default” Actions for that Function – without allowance for the 1 hour delay that is provided in LCO 3.0.3. Furthermore, the Function-specific “default” actions (currently, or proposed to be, specified for some Functions) impose requirements intended to establish safe operation that are not necessarily required by LCO 3.0.3. Since each Function-specific default action is specifically considering that Function’s safety-basis, such default actions necessarily result in more appropriate actions than the general default actions of LCO 3.0.3. Specifically, the Actions for each new Condition associated with DOC M02 for RTS and ESFAS Functions applicable in MODES1, 2, 3, or 4, are compared to LCO 3.0.3, and in each case, the new Actions are equivalent to or more restrictive than the actions of LCO 3.0.3.

As a result, MTS 3.3.9, Condition C, which becomes STS 3.3.9 Condition C, leads to the following new default Actions in STS 3.3.9:

> Actions E and L (MTS 3.3.9 revised Actions E and N) require placing the unit in Mode 3 in 6 hours and Mode 5 in 36 hours, which is more restrictive than LCO 3.0.3.
>
> Action D (MTS 3.3.9 revised Action D) requires placing the unit in Mode 3 in 6 hours, which is more restrictive than the time allowed by LCO 3.0.3, and in Mode 4 “with the Reactor Coolant System (RCS) cooling provided by the Normal Residual Heat Removal System (RNS)” in 24 hours. The specific RNS alignment and RCS heat removal requirement are not requirements found in LCO 3.0.3.
>
> Action F (which replaced MTS 3.3.9 Actions F, G, and H) directs the operator to immediately, “Declare affected isolation valve(s) inoperable.” (STS 3.3.9 Action F is also discussed under changes proposed in DOC L12.) For STS 3.3.9 manual initiation Function 4, 5, 10, or 11 with two channels inoperable (or one inoperable channel not restored within allowed time), Required Action F.1 will result in applying the applicable Conditions and Required Actions of STS 3.1.9, 3.6.3, 3.7.2, 3.7.3, and 3.7.7 (see Section V for details). These action requirements are more appropriate than the action requirements of
>
> — MTS 3.3.9 Condition F (applies to MTS Function 11, Normal Residual Heat Removal System Isolation – Manual Initiation);
>
> — MTS 3.3.9 Condition G (applies to MTS Function 10, Chemical Volume and Control System Makeup Isolation – Manual Initiation); and
>
> — MTS 3.3.9 Condition H (applies to MTS Function 4, Steam Line Isolation – Manual Initiation, and MTS Function 5, Main Feedwater Control Valve Isolation – Manual Initiation)

Action G (MTS 3.3.9 revised Action I) applies to ESFAS manual initiation Functions with Mode 4 Applicability that overlaps the Mode 4 Applicability of LCO 3.0.3. Action G requires placing the unit in Mode 5 in 12 hours, which is more restrictive than the time allowed by LCO 3.0.3; it also requires initiating action to open the RCS pressure boundary within 12 hours, which is an action not required by LCO 3.0.3.

Action J (MTS 3.3.9 revised Action L) requires placing the unit in Mode 5 in 12 hours; it also requires suspending positive reactivity additions, which is an action not required by LCO 3.0.3.

GTS 3.3.1 and 3.3.2 actions do not specify conditions that explicitly address multiple inoperable channels (that is, more than two inoperable channels or divisions, in most cases), and therefore default to LCO 3.0.3. In each instance, the proposed actions to address these conditions are more restrictive than the LCO 3.0.3 actions because completion times for reaching lower operational modes are shorter by 1 hour. In addition, Function-specific actions, where specified, are more appropriate for the affected Function than the unit-shutdown actions of LCO 3.0.3 alone. Therefore, the changes specified by DOC M02 do not introduce any adverse impact on public health and safety.

DOC L12, revise GTS 3.3.2 Conditions and Required Actions for ESFAS instrumentation manual initiation Functions that result in valve isolation actuations

DOC L12 revises Actions related to Functions that result in valve isolation actuations (MTS 3.3.9 Functions 4, 5, 10, and 11). MTS 3.3.9 Actions F, G, and H (GTS 3.3.2 Actions Q, R and S), are replaced with STS 3.3.9 Action F and the more appropriate action requirements of STS Subsections 3.1.9, 3.6.3, 3.7.2, 3.7.3, and 3.7.7, which apply to the actuated devices; i.e., valves). STS 3.3.9 Required Action F.1 says:

Declare affected isolation valve(s) inoperable. | Immediately

Associated with the changes in action requirements for MTS Functions 4, 5, 10, and 11, are changes in their Applicability. MTS Table 3.3.9-1 footnotes (d) and (e) (GTS Table 3.3.2-1 footnotes (e) and (h)) are deleted.

With the deletion of MTS Table 3.3.9-1 footnote (d) “Not applicable for valve isolation Functions whose associated flow path is isolated.”

- MTS 3.3.9 Function 5, Main Feedwater Control Valve Isolation – Manual Initiation, will be required in Mode 4 regardless of whether the affected valve’s flow path is isolated, as well as in Modes 1, 2, and 3.

- MTS 3.3.9 Function 10, CVS Makeup isolation – Manual Initiation, will be required in Modes 3 and 4 regardless of whether the affected valve’s flow path is isolated, as well as in Modes 1 and 2, and in Mode 4 with the RCS not being cooled by the RNS.

- MTS 3.3.9 Function 11, RNS Isolation – Manual Initiation, will be required in Mode 3 regardless of whether the affected valve’s flow path is isolated, as well as in Modes 1 and 2.

With the deletion of MTS 3.3.9 Table 3.3.9-1 footnote (e) “Not applicable if all MSIVs are closed.”

- MTS 3.3.9 Function 4, Steam Line Isolation – Manual Initiation, will be required in Modes 2, 3, and 4 regardless of MSIV position, as well as in Mode 1.

GTS 3.3.2 Actions related to ESFAS manual initiation Functions that result in valve isolation actuations have Actions for inoperable instrumentation channels that vary in consistency. Functions that provide the Applicability modifier Footnotes that allow isolation of the affected valve(s) and exiting the Applicability, specifically GTS Table 3.3.2-1 footnotes (e) and (h), allow exiting the Applicability upon isolation of the affected flow paths or closure of the affected isolation valve(s). These footnotes are often associated with GTS Actions P, R, S, and T that retain periodic verification of the isolated status, which would no longer be applicable.

GTS 3.3.2 Required Actions P.2.1, Q.1, Z.1, and AA.1.2.1 provide a specific list of acceptable isolation devices while other Required Actions such as R.2.1.1 and S.2.1.2 simply assure the isolated condition is established. GTS Action T uniquely allows either a requirement to isolate the flow path and periodically verify the isolated condition imposed by GTS Required Actions T.1.1 and T.1.2.2, or a requirement to isolate the flow path followed later by requiring one of a specific list of acceptable isolation devices with no periodic verification imposed by GTS Required Actions T.1.1 and T.1.2.1.

Additionally, GTS Actions Q, R, and S contain optional default Required Actions for compensatory measures such as unit shutdown that may be elected in lieu of any requirement to isolate flow paths.

These nuances result in increased complexity and introduce an increased potential for confusion and misapplication. Since each of these ESFAS instrumentation manual initiation Functions supports operability of the associated actuated valves, the impact of instrumentation inoperability should be consistent with Actions for the inoperability of the actuated supported system. The simplest approach to achieve this desired result is to allow the supported system Actions for inoperable valves to dictate the required measures. Therefore, each of the instrument Function Actions associated with this change is revised to “Declare affected isolation valve(s) inoperable.” This approach is in accordance with LCO 3.0.6.

<u>DOC L18, Deletion of Modes 5 and 6 from Applicability of ESFAS Instrumentation Function, Containment Isolation – Manual Initiation</u>

DOC L18 removes requirements for operable containment isolation signals in Modes 5 and 6, allowing manual operator actions to complete any required isolation prior to steaming into the containment. GTS LCO 3.6.8.d (STS LCO 3.6.7.d) provides the requirements for each penetration providing direct access from the containment atmosphere to the outside atmosphere. The penetrations covered by this LCO requirement are those providing direct access to the outside atmosphere, which includes the containment air filter supply and exhaust penetrations, and the vent and purge valves and the vacuum relief valves. For postulated events in Modes 5 and 6, RCS heat removal is provided by either passive residual heat removal (PRHR) or IRWST injection and containment sump recirculation. To support RCS heat removal, containment closure is required to limit the loss of the cooling water inventory from containment. The only Containment Isolation Signals required by GTS 3.3.2 in Modes 5 and 6 are the manual initiation functions. There are no automatic isolation functions required. Thus, GTS LCO 3.6.8.d.2 requires the associated valves to be capable of closing from a Manual signal only. GTS LCO 3.6.8.a, b, and c provide the requirements for the equipment hatches, air locks doors, and containment spare penetrations. All three of these requirements allow the associated penetration to be open, provided that it is capable of being closed prior to steaming into the containment. This capability is not reliant on any remote closure signals or automatic features. Manual closure capability is acceptable. The equipment hatches and personnel air locks have openings that are much larger than the containment air filter supply and exhaust penetrations, which are 36 inch penetrations. Closing these larger penetrations may involve more protracted procedures to affect manual closure than would be for the containment air filter supply and

exhaust penetrations. Therefore, it is appropriate to allow the purge valve penetrations to be open, provided they can be closed prior to steaming into the containment. This allows all for major penetration flow paths to be controlled in a similar manner.

GTS SR 3.6.8.3, as well as the corresponding Containment Isolation Function in GTS Table 3.3.2-1, Function 3.a for Modes 5 and 6 are deleted (STS Table 3.3.9-1, Function 3), consistent with this change. GTS SR 3.6.8.1, “Verify each required containment penetration is in the required status.” (STS SR 3.6.7.1) is adequate for ensuring the requirements of GTS LCO 3.6.8.d.2 (STS LCO 3.6.7.d, “The containment penetrations shall be in the following status: Each penetration providing direct access from the containment atmosphere to the outside atmosphere, if open, can be closed by a manual or automatic isolation valve, blind flange, or equivalent prior to steaming into the containment.”), if being used to comply with the LCO, are verified on a periodic basis. Provided the appropriate closure timing capability is provided commensurate with the timing necessary to achieve the closure prior to steaming into the containment, this change will not adversely impact public health and safety. Therefore, elimination of Modes 5 and 6 from the Applicability for MTS 3.3.9 Function 3 is acceptable.

The remaining changes, including those made by DOC A028, are editorial, clarifying, grammatical, or otherwise considered administrative. These changes do not affect the technical content, but improve the readability, implementation, and understanding of the requirements, and are therefore acceptable.

Having found that this GTST’s proposed changes to the GTS and Bases are acceptable, the NRC staff concludes that AP1000 STS Subsection 3.3.9 is an acceptable model Specification for the AP1000 standard reactor design.

References to Previous NRC Safety Evaluation Reports (SERs):

None

VIII. Review Information

Evaluator Comments:

None

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Review Information:

Availability for public review and comment on Revision 0 of this traveler approved by NRC staff on 5/29/2014.

APOG Comments (Ref. 7) and Resolutions:

1. (Internal # 3) Throughout the Bases, references to Sections and Chapters of the FSAR do not include the “FSAR” clarifier. Since these Section and Chapter references are to an external document, it is appropriate (DOC A003) to include the “FSAR” modifier. This is resolved by adding the FSAR modifier as appropriate.

2. (Internal # 6) The GTST sections often repeat VEGP LAR DOCs, which reference “existing” and “current” requirements. The inclusion in the GTST of references to “existing” and “current,” are not always valid in the context of the GTS. Each occurrence of “existing” and “current” should be revised to be clear and specific to GTS, MTS, or VEGP COL TS (or other), as appropriate. Noted ambiguities are corrected in the GTST body.

3. (Internal # 7) Section VII, GTST Safety Evaluation, inconsistently completes the subsection “References to Previous NRC Safety Evaluation Reports (SERs)” by citing the associated SE for VEGP 3&4 COL Amendment 13. It is not clear whether there is a substantive intended difference when omitting the SE citation. This is resolved by removing the SE citation in Section VII of the GTST and ensuring that appropriate references to the consistent citation of this reference in Section X of the GTST are made.

4. (Internal # 116 and 165) In GTST for Subsection 3.3.8, Section VI, under the heading “Rationale for changes in RCOL Std. Dep., RCOL COL Item(s), and RCOL PTS Changes,” the first paragraph mentions DOC A024. This DOC is for changes to RTS Instrumentation and does not affect Subsection 3.3.8. Note that it is not mentioned anywhere else in this Subsection. This is also stated in Subsections 3.3.9 through 3.3.16. Change “DOCs A024 and A028” to “DOC A028” in GTST 3.3.8 through GTST 3.3.16. This is resolved by making the recommended change. Note that comment # 116 is actually directed at removing DOC A028 in Subsections 3.3.1 through 3.3.7, but the opposite is true for DOC A024 in Subsections 3.3.8 through 3.3.16 as stated above.

5. (Internal # 179) In GTST for Subsection 3.3.9, Section II, under the heading “RCOL PTS Change Number and Title,” DOC A029 is identified as a “Revision of MTS 3.3.9 Required Action G.2 statement.” This should either be “STS” 3.3.9 Required Action G.2 or MTS 3.3.9 Required Action “I.2.” Correctly identify the change using consistent terminology. This is

resolved by making the recommended change. Under the listing for DOC A029, change "G.2" to "I.2."

6. (Internal # 180) In GTST for Subsection 3.3.9, Section V, under the heading "Changes to the Generic Technical Specifications and Bases," DOC M02 description (fifth paragraph below the table) states that Condition C is revised by adding a second condition that states "one or more Functions with more than two channels inoperable." The Condition actually reads "one or more Functions with two channels inoperable." Change sentence to read "one or more Functions with two channels inoperable." This is resolved by making the recommended change.

7. (Internal # 181) In GTST for Subsection 3.3.9, Section VII, under the heading "Technical Analysis," the 6th paragraph related to the description of the changes due to DOC M02 contains a set of nested paragraphs. The third nested change is related to Action F. The first sentence states in a parenthetical that it is "MTS 3.3.9 revised Actions F, G, and H." However, the description of the new action is only for Action F. Neither Action G nor Action H are described. Revise the parenthetical to delete reference to Actions G and H. NRC staff prefers to retain the references to Actions G and H, and recommends the following clarification:

   Action F (**which replaced** MTS 3.3.9 ~~revised~~ Actions F, G, and H)~~, which~~ directs the operator to immediately, "Declare affected isolation valve(s) inoperable." (STS 3.3.9 Action F is **also** discussed under changes proposed in DOC L12.) For STS 3.3.9 manual initiation Function 4, 5, 10, or 11 with two channels inoperable **(or one inoperable channel not restored within allowed time)**, Required Action F.1 will result in applying the applicable Conditions and Required Actions of STS 3.1.9, 3.6.3, 3.7.2, 3.7.3, and 3.7.7 (see Section V for details). **These action requirements are more appropriate than the action requirements of**

   - **MTS 3.3.9 Condition F (applies to MTS Function 11, Normal Residual Heat Removal System Isolation – Manual Initiation);**
   - **MTS 3.3.9 Condition G (applies to MTS Function 10, Chemical Volume and Control System Makeup Isolation – Manual Initiation); and**
   - **MTS 3.3.9 Condition H (applies to MTS Function 4, Steam Line Isolation – Manual Initiation, and MTS Function 5, Main Feedwater Control Valve Isolation – Manual Initiation)**

8. (Internal # 182) In GTST for Subsection 3.3.9, Section VII, under the heading "Technical Analysis," there is a fragment of a sentence ("which applies to STS 3.3.9 Functions 4, 5, 10, and 11") following the first paragraph under the heading "DOC L12, ..." Add the additional text necessary to complete the sentence, or delete the fragment. This is resolved by making the recommended change.

   DOC L12 revises Actions related to Functions that result in valve isolation actuations (MTS 3.3.9 Functions 4, 5, 10, and 11). MTS 3.3.9 Actions F, G, and H (GTS 3.3.2 ~~Conditions~~ Actions Q, R and S), are ~~revised~~ **replaced with STS 3.3.9 Action F and the more appropriate action requirements of STS Subsections 3.1.9, 3.6.3, 3.7.2, 3.7.3, and 3.7.7, which apply to the actuated devices; i.e., valves). STS 3.3.9 Required Action F.1 says:** ~~to immediately~~

Declare affected isolation valve(s) inoperable. **| Immediately**

Associated with the changes in action requirements for MTS Functions 4, 5, 10, and 11, are changes in their Applicability. MTS Table 3.3.9-1 footnotes (d) and (e) (GTS Table 3.3.2-1 footnotes (e) and (h)) are deleted.

With the deletion of MTS Table 3.3.9-1 footnote (d) "Not applicable for valve isolation Functions whose associated flow path is isolated.":

- **MTS 3.3.9 Function 5, Main Feedwater Control Valve Isolation – Manual Initiation, will be required in Mode 4 regardless of whether the affected valve's flow path is isolated, as well as in Modes 1, 2, and 3.**

- **MTS 3.3.9 Function 10, CVS Makeup isolation – Manual Initiation, will be required in Modes 3 and 4 regardless of whether the affected valve's flow path is isolated, as well as in Modes 1 and 2, and in Mode 4 with the RCS not being cooled by the RNS.**

- **MTS 3.3.9 Function 11, RNS Isolation – Manual Initiation, will be required in Mode 3 regardless of whether the affected valve's flow path is isolated, as well as in Modes 1 and 2.**

With the deletion of MTS 3.3.9 Table 3.3.9-1 footnote (e) "Not applicable if all MSIVs are closed.":

- **MTS 3.3.9 Function 4, Steam Line Isolation – Manual Initiation, will be required in Modes 2, 3, and 4 regardless of MSIV position, as well as in Mode 1.**

~~Which applies to STS 3.3.9 Functions 4, 5, 10, and 11.~~

9. (Internal # 183) Table 3.3.9-1 first page number states "(page -1 of 2)"; it should be "(page 1 of 2)"; and second page states "(page 0 of 2); it should be "(page 2 of 2)." Correct Table 3.3.9-1 page numbering. This is resolved by making the recommended change.

10. (Internal # 184) The lead-in to the "ASA, LCO, and Applicability" section of the Bases has a bullet for "Main Feedwater Control Valve Isolation" and refers to LCO 3.3.8 Bases for details. However, the protective functions also include "Main Feedwater Pump Trip and Valve Isolation" as well as "Startup Feedwater Isolation." These two functions should be included in this list. Add bullets for:

    - **Main Feedwater Pump Trip and Valve Isolation**

    - **Startup Feedwater Isolation**

    This is resolved by making the recommended change with an alternate presentation:

    - ~~Main~~ Feedwater ~~Control Valve~~ Isolation

        - **Main Feedwater Control Valve Isolation**

        - **Main Feedwater Pump Trip and Valve Isolation**

— **Startup Feedwater Isolation**

11. (Internal # 185) The “ASA, LCO, and Applicability” section of the Bases under the heading “1. Safeguards Actuation – Manual Initiation,” uses the term “ESF.” ESF – Engineered Safety Features – has not been previously defined. Change “ESF” to “Engineered Safety Features (ESF).” This is resolved by making the recommended change.

NRC Final Approval Date: 12/14/2015

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IX. Evaluator Comments for Consideration in Finalizing Technical Specifications and Bases

Final production of files for Subsections 3.3.1, 3.3.8, and 3.3.9 will require reformatting of footnotes for Table 3.3.1-1, Table 3.3.8-1, and Table 3.3.9-1 to conform to Writer's Guide (Ref. 4) Sections 2.1.2 and 2.1.9; in particular [with clarification]:

2.1.2 Page Format

d. The suggested font is Arial 11 point for all type. … Reduced footnote, table, or figure font sizes may occasionally be required, but to ensure readability, these fonts should be no smaller than [Arial] 8 point …

2.1.9 Figure and Table Footnote Format

Footnotes are restricted for use in figures and tables. Footnotes are not used in Specifications or Bases except in figures and tables.

a. Use superscript, lower-case letters enclosed within parentheses as footnote designators where it modifies an item. Order them alphabetically.

b. If the same footnote is repeated in a figure or table, use the same footnote designator for each repeated reference. Do so even if the continued figure and table span several pages.

c. Place the footnote key on each page the footnote appears. Include in the key only those footnotes appearing on that page. For tables, the key is placed two blank lines below the table. … For figures, the key is two blank lines below the figure and one blank line above the title.

d. Footnote designators in the key should not be superscript. Text in the key should be indented two [en] spaces from the footnote designator.

e. On occasion, table width may preclude the use of the normal size font. When this occurs, regardless of the font [size] used, use the same font [size] for all facets of the figure or table: [except title], column headings, body text, and footnotes.

The above corrections will require moving Table entries from page to page to make room for the necessary footnotes. Note that these changes are necessary on the LCO mark-up and on the LCO clean version.

X. References Used in GTST

1. AP1000 DCD, Revision 19, Section 16, “Technical Specifications,” June 2011 (ML11171A500).

2. Southern Nuclear Operating Company, Vogtle Electric Generating Plant, Units 3 and 4, Technical Specifications Upgrade License Amendment Request, February 24, 2011 (ML12065A057).

3. NRC Safety Evaluation (SE) for Amendment No. 13 to Combined License (COL) No. NPF-91 for Vogtle Electric Generating Plant (VEGP) Unit 3, and Amendment No. 13 to COL No. NPF-92 for VEGP Unit 4, September 9, 2013, ADAMS Package Accession No. ML13238A337, which contains:

   ML13238A355 Cover Letter - Issuance of License Amendment No. 13 for Vogtle Units 3 and 4 (LAR 12-002).
   ML13238A359 Enclosure 1 - Amendment No. 13 to COL No. NPF-91
   ML13239A256 Enclosure 2 - Amendment No. 13 to COL No. NPF-92
   ML13239A284 Enclosure 3 - Revised plant-specific TS pages (Attachment to Amendment No. 13)
   ML13239A287 Enclosure 4 - Safety Evaluation (SE), and Attachment 1 - Acronyms
   ML13239A288 SE Attachment 2 - Table A - Administrative Changes
   ML13239A319 SE Attachment 3 - Table M - More Restrictive Changes
   ML13239A333 SE Attachment 4 - Table R - Relocated Specifications
   ML13239A331 SE Attachment 5 - Table D - Detail Removed Changes
   ML13239A316 SE Attachment 6 - Table L - Less Restrictive Changes

   The following documents were subsequently issued to correct an administrative error in Enclosure 3:

   ML13277A616 Letter - Correction To The Attachment (Replacement Pages) - Vogtle Electric Generating Plant Units 3 and 4-Issuance of Amendment Re: Technical Specifications Upgrade (LAR 12-002) (TAC No. RP9402)
   ML13277A637 Enclosure 3 - Revised plant-specific TS pages (Attachment to Amendment No. 13) (corrected)

4. TSTF-GG-05-01, “Writer's Guide for Plant-Specific Improved Technical Specifications,” June 2005.

5. RAI Letter No. 01 Related to License Amendment Request (LAR) 12-002 for the Vogtle Electric Generating Plant Units 3 and 4 Combined Licenses, September 7, 2012 (ML12251A355).

6. Southern Nuclear Operating Company, Vogtle Electric Generating Plant, Units 3 and 4, Response to Request for Additional Information Letter No. 01 Related to License Amendment Request LAR-12-002, ND-12-2015, October 04, 2012 (ML12286A363 and ML12286A360)

7. APOG-2014-008, APOG (AP1000 Utilities) Comments on AP1000 Standardized Technical Specifications (STS) Generic Technical Specification Travelers (GTSTs), Docket ID NRC-2014-0147, September 22, 2014 (ML14265A493).

XI. MARKUP of the Applicable GTS Subsection for Preparation of the STS NUREG

The entire section of the Specifications and the Bases associated with this GTST is presented next.

Changes to the Specifications and Bases are denoted as follows: Deleted portions are marked in strikethrough red font, and inserted portions in bold blue font.

3.3 INSTRUMENTATION

3.3.9 Engineered Safety Feature Actuation System (ESFAS) Manual Initiation

LCO 3.3.9 The ESFAS manual initiation channels for each Function in Table 3.3.9-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.9-1.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ----------NOTE---------- Not applicable to Functions 1, 6, 7, 8, 12, and 13 in MODE 5 or 6. --- One or more Functions with one channel inoperable.	A.1 Restore channel to OPERABLE status.	48 hours
B. ----------NOTE---------- Only applicable to Functions 1, 6, 7, 8, 12, and 13 in MODE 5 or 6. --- One or more Functions with one channel inoperable.	B.1 Restore channel to OPERABLE status.	72 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met. **OR** **One or more Functions with two channels inoperable.**	C.1 Enter the Condition referenced in Table 3.3.9-1 for the channel(s).	Immediately
D. As required by Required Action C.1 and referenced in Table 3.3.9-1.	D.1 Be in MODE 3. AND D.2 Be in MODE 4 with the Reactor Coolant System (RCS) cooling provided by the Normal Residual Heat Removal System (RNS).	6 hours 24 hours
E. As required by Required Action C.1 and referenced in Table 3.3.9-1.	E.1 Be in MODE 3. AND E.2 Be in MODE 5.	6 hours 36 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. As required by Required Action C.1 and referenced in Table 3.3.9-1.	F.1 **Declare affected isolation valve(s) inoperable.** ~~NOTE~~ ~~Flow path(s) may be unisolated intermittently under administrative controls.~~	**Immediately**
	~~Isolate the affected flow path(s) by use of at least one closed manual or closed and de-activated automatic valve.~~	~~6 hours~~
	~~OR~~	
	~~F.2.1 Be in MODE 3.~~	~~12 hours~~
	~~AND~~	
	~~F.2.2 Be in MODE 4.~~	~~18 hours~~
~~G. As required by Required Action C.1 and referenced in Table 3.3.9-1.~~	~~G.1 Be in MODE 3.~~	~~6 hours~~
	~~AND~~	
	~~NOTE~~ ~~Flow path(s) may be unisolated intermittently under administrative controls.~~	
	~~G.2.1.1 Isolate the affected flow path(s).~~	~~12 hours~~
	~~AND~~	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. (continued)	G.2.1.2 Verify the affected flow path is isolated. OR G.2.2 Be in MODE 4 with the RCS cooling provided by the RNS.	Once per 7 days 30 hours
H. As required by Required Action C.1 and referenced in Table 3.3.9-1.	H.1 Be in MODE 3. AND H.2.1.1 Be in MODE 4 with the RCS cooling provided by the RNS. AND NOTE Flow path(s) may be unisolated intermittently under administrative controls. H.2.1.2 Isolate the affected flow path(s). AND H.2.1.3 Verify the affected flow path is isolated. OR H.2.2 Be in MODE 5.	6 hours 24 hours 30 hours Once per 7 days 42 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G~~I~~. As required by Required Action C.1 and referenced in Table 3.3.9-1.	**G**~~I~~.1 Be in MODE 5. AND **G**~~I~~.2 Initiate action to open the RCS pressure boundary ~~and establish a pressurizer level ≥ 20%~~.	12 hours 12 hours
H~~J~~. As required by Required Action C.1 and referenced in Table 3.3.9-1.	**H**~~J~~.1 Suspend positive reactivity additions. AND **H**~~J~~.2 ~~If in MODE 5 with RCS open and < 20% pressurizer level, i~~**I**nitiate action to ~~be in MODE 5 with RCS~~ open **RCS pressure boundary** and **establish** ≥ 20% pressurizer level.	Immediately Immediately
I~~K~~. As required by Required Action C.1 and referenced in Table 3.3.9-1.	**I**~~K~~.1 Suspend positive reactivity additions. AND **I**~~K~~.2 ~~If in MODE 6 with upper internals in place, i~~**I**nitiate action to **remove** ~~be in MODE 6 with~~ the upper internals ~~removed~~.	Immediately Immediately
J~~L~~. As required by Required Action C.1 and referenced in Table 3.3.9-1.	**J**~~L~~.1 Suspend positive reactivity additions. AND	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
JL. (continued)	JL.2 Be in MODE 5. AND JL.3 Initiate action to establish a pressurizer level ≥ 20% with the RCS pressure boundary intact.	12 hours 12 hours
KM. As required by Required Action C.1 and referenced in Table 3.3.9-1.	KM.1 Suspend positive reactivity additions. AND KM.2 If in MODE 6, iInitiate action to **establish** be in MODE 6 with the water level ≥ 23 feet above the top of the reactor vessel flange.	Immediately Immediately
LN. As required by Required Action C.1 and referenced in Table 3.3.9-1.	LN.1 Be in MODE 3. AND LN.2 Be in MODE 5. AND LN.3 Open a containment air flow path ≥ 6 inches in diameter.	6 hours 36 hours 44 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	----------NOTE---------- Verification of setpoint not required ~~for manual initiation functions~~. ---------- Perform TRIP ACTUATING DEVICE OPERATIONAL TEST (TADOT).	24 months

Table 3.3.9-1 (page 1 of 2)
Engineered Safeguards Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS
1. Safeguards Actuation - Manual Initiation	1,2,3,4	2 switches	E
	5	2 switches	JL
2. Core Makeup Tank (CMT) Actuation - Manual Initiation	1,2,3,4[a]	2 switches	D
	4[b],5[c]	2 switches	GI
3. Containment Isolation - Manual Initiation	1,2,3,4	2 switches	E
	5[d],6[d]	2 switches	L
4. Steam Line Isolation - Manual Initiation	1,2[e],3[e],4[e]	2 switches	FH
5. Main Feedwater Control Valve Isolation - Manual Initiation	1,2,3,4[d]	2 switches	FH
6. Automatic Depressurization System (ADS) Stages 1, 2 & 3 Actuation - Manual Initiation	1,2,3,4	2 switch sets	E
	5[df],6[f][h]	2 switch sets	HJ
7. ADS Stage 4 Actuation - Manual Initiation	1,2,3,4	2 switch sets	E
	5[f],6[ef][h]	2 switch sets	HK
	5[f],6[ef][h]	2 switch sets	IK
8. Passive Containment Cooling Actuation - Manual Initiation	1,2,3,4	2 switches	E
	5[fi]	2 switches	JL
	6[fi]	2 switches	KM
9. Passive Residual Heat Removal Heat Exchanger Actuation - Manual Initiation	1,2,3,4	2 switches	E
	5[c]	2 switches	GI
10. Chemical Volume and Control System Makeup Isolation - Manual Initiation	1,2,3[d],4[a][d]	2 switches	FG

Table 3.3.9-1 (page 2 of 2)
Engineered Safeguards Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS
11. Normal Residual Heat Removal System Isolation - Manual Initiation	1,2,3~~(d)~~	2 switch sets	F
12. In-Containment Refueling Water Storage Tank (IRWST) Injection Line Valve Actuation - Manual Initiation	1,2,3,4(a)	2 switch sets	D
	4(b),5	2 switch sets	J~~L~~
	6	2 switch sets	K~~M~~
13. IRWST Containment Recirculation Valve Actuation - Manual Initiation	1,2,3,4(a)	2 switch sets	D
	4(b),5	2 switch sets	J~~L~~
	6	2 switch sets	K~~M~~
14. SG Power Operated Relief Valve and Block Valve Isolation - Manual Initiation	1,2,3,4(a)	2 switches	D
15. Containment Vacuum Relief Valve Actuation - Manual Initiation	1,2,3,4,5~~(g)~~j),6~~(g)~~j)	2 switches	L~~N~~

(a) With the RCS not being cooled by the Normal Residual Heat Removal System (RNS).

(b) With the RCS being cooled by the RNS.

(c) With the RCS pressure boundary intact.

~~(d) Not applicable for valve isolation Functions whose associated flow path is isolated.~~

~~(e) Not applicable if all MSIVs are closed.~~

~~(f) Not applicable when the required ADS valves are open. See LCO 3.4.12 and LCO 3.4.13 for ADS valve and equivalent relief area requirements.~~

(d~~g~~) With **the RCS pressure boundary intact** and **with** pressurizer level ≥ 20%.

(e~~h~~) With upper internals in place.

(f~~i~~) With decay heat > 6.0 MWt.

(g~~j~~) Without an open containment air flow path ≥ 6 inches in diameter.

B 3.3 INSTRUMENTATION

B 3.3.9 Engineered Safety Feature Actuation System (ESFAS) Manual Initiation

BASES

BACKGROUND

A description of the ESFAS Instrumentation is provided in the Bases for LCO 3.3.8, “Engineered Safety Feature Actuation System (ESFAS) Instrumentation.”

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

A description of the following ESFAS protective functions is provided in the Bases for LCO 3.3.8:

- Safeguards Actuation
- Core Makeup Tank (CMT) Actuation
- Containment Isolation
- Steam Line Isolation
- ~~Main~~ Feedwater ~~Control Valve~~ Isolation
  - **Main Feedwater Control Valve Isolation**
  - **Main Feedwater Pump Trip and Valve Isolation**
  - **Startup Feedwater Isolation**
- Automatic Depressurization System (ADS) Stages 1, 2, & 3 Actuation
- ADS Stage 4 Actuation
- Passive Containment Cooling Actuation
- Passive Residual Heat Removal Heat Exchanger Actuation
- Chemical Volume and Control System Makeup Isolation
- Normal Residual Heat Removal System Isolation

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

- In-Containment Refueling Water Storage Tank (IRWST) Injection Line Valve Actuation
- IRWST Containment Recirculation Valve Actuation
- Steam Generator (SG) Power Operated Relief Valve and Block Valve Isolation
- Containment Vacuum Relief Valve Actuation

The LCO requires OPERABILITY of two devices for each manual initiation Function listed in Table 3.3.9-1. Two manual initiation channels are required to ensure no single random failure disables the ESFAS. The required channels of ESFAS instrumentation provide plant protection in the event of any of the analyzed accidents **(Ref. 1)**. ESFAS manual initiation functions are as follows:

1. Safeguards Actuation – Manual Initiation

   The LCO requires that two manual initiation devices are OPERABLE. The operator can initiate the Safeguards Actuation signal at any time by using either of two switches in the main control room. This action will cause actuation of all components in the same manner as any of the automatic actuation signals.

   The LCO on Safeguards Actuation – Manual Initiation ensures the proper amount of redundancy is maintained in the manual Safeguards actuation circuitry to ensure the operator has manual Safeguards Actuation capability.

   Each device consists of one switch and the interconnecting wiring to all four divisions. Each manual initiation device actuates all four divisions. This configuration does not allow testing at power.

   Manual Safeguards Actuation must be OPERABLE in MODES 1, 2, 3, and 4.

   Manual initiation is required in MODE 5 to support system level initiation.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

This Safeguards Actuation Function is not required to be OPERABLE in MODE 6 because there is adequate time for the operator to evaluate plant conditions and respond by manually starting individual systems, pumps, and other equipment to mitigate the consequences of an abnormal condition or accident. Plant pressure and temperature are very low and many **Engineered Safety Features (**ESF**)** components are administratively locked out or otherwise prevented from actuating to prevent inadvertent overpressurization of plant systems.

2. Core Makeup Tank (CMT) Actuation – Manual Initiation

CMT Actuation provides the passive injection of borated water into the RCS. Injection provides RCS makeup water and boration during transients or accidents when the normal makeup supply from the Chemical and Volume Control System (CVS) is lost or insufficient.

Manual CMT Valve Actuation is accomplished by either of two switches in the main control room. Either switch activates all four divisions.

Manual CMT Valve Actuation must be OPERABLE in MODES 1 through 3, and MODE 4 with the Reactor Coolant System (RCS) not cooled by the Normal Residual Heat Removal System (RNS). Manual actuation of the CMT valves is additionally required in MODE 4 when the RCS is being cooled by the RNS, and MODE 5 with the RCS pressure boundary intact. Actuation of this Function is not required in MODE 5 with the RCS pressure boundary open, or MODE 6 because the CMTs are not required to be OPERABLE in these MODES.

3. Containment Isolation – Manual Initiation

Containment isolation is necessary to prevent or limit the release of radioactivity to the environment in the event of a large break LOCA.

Manual Containment Isolation is accomplished by either of two switches in the main control room. Either switch actuates all four ESFAS divisions. Manual initiation of Containment Isolation must be OPERABLE in MODES 1, 2, 3, and 4, when containment integrity is required.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

4. Steam Line Isolation – Manual Initiation

Isolation of the main steam lines provides protection in the event of a Steam Line Break (SLB) inside or outside containment.

Manual initiation of Steam Line Isolation can be accomplished from the main control room. There are two switches in the main control room and either switch can initiate action to immediately close all main steam isolation valves (MSIVs).

The LCO requires two OPERABLE channels in MODES 1, 2, 3, and 4. In MODES 5 and 6, this Function is not required to be OPERABLE because there is insufficient energy in the secondary side of the unit to cause an accident.

5. ~~Main~~ Feedwater ~~Control Valve~~ Isolation – Manual Initiation

The primary Function of ~~Main~~ Feedwater ~~Control Valve~~ Isolation is to prevent damage to the turbine due to water in the steam lines and to stop the excessive flow of feedwater into the SGs.

Manual ~~Main~~ Feedwater ~~Control Valve~~ Isolation can be accomplished from the main control room. There are two switches in the main control room and either switch can initiate action in both divisions to close all main and startup feedwater control, isolation and crossover valves, trip all main and startup feedwater pumps, and trip the turbine.

~~Main~~ **F**eedwater isolation is necessary in MODES 1, 2, 3, and 4 to mitigate the effects of a large SLB or feedwater line break (FLB). In MODES 5 and 6, the energy in the RCS and the steam generators is low and this function is not required to be OPERABLE.

6. ADS Stages 1, 2, & 3 Actuation – Manual Initiation

The Automatic Depressurization System (ADS) provides a sequenced depressurization of the reactor coolant system to allow passive injection from the CMTs, accumulators, and the in-containment refueling water storage tank (IRWST) to mitigate the effects of a LOCA.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The operator can initiate an ADS Stages 1, 2, and 3 actuation from the main control room by simultaneously actuating two ADS actuation devices in the same set. There are two sets of two switches each in the main control room. Simultaneously actuating the two devices in either set will actuate ADS Stages 1, 2, and 3.

This Function must be OPERABLE in MODES 1 through 4, and MODE 5 with the RCS pressure boundary intact and with pressurizer level ≥ 20%. In MODE 5 with the RCS open and in MODE 6, LCO 3.4.13, ADS – Shutdown, RCS Open, required the ADS Stages 1, 2, and 3 valves to be open. Thus, Manual actuation is not required.

7. ADS Stage 4 Actuation – Manual Initiation

The ADS provides a sequenced depressurization of the reactor coolant system to allow passive injection from the CMTs, accumulators, and the IRWST to mitigate the effects of a LOCA.

The fourth stage depressurization valves open on manual actuation. The operator can initiate Stage 4 of ADS from the main control room. There are two sets of two switches each in the main control room. Actuating the two switches in either set will actuate all 4th stage ADS valves. This manual actuation is interlocked to actuate with either the low RCS pressure signal or with the ADS Stages 1, 2, & 3 actuation. These interlocks minimize the potential for inadvertent actuation of this Function. This interlock with the ADS Stages 1, 2, & 3 actuation Function allows manual actuation of this Function if automatic or manual actuation of the ADS Stages 1, 2, & 3 valves fails to depressurize the RCS due to common-mode failure. This consideration is important in PRA modeling to improve the reliability of reducing the RCS pressure following a small LOCA or transient event. This Function must be OPERABLE in MODES 1 through 5, and MODE 6 with the upper internals in place. In MODE 6 with the upper internals not in place, the Stage 4 ADS valves are not required to be OPERABLE by LCO 3.4.13, thus Manual Initiation of the valves is not required.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

8. Passive Containment Cooling Actuation – Manual Initiation

The Passive Containment Cooling System (PCS) transfers heat from the reactor containment to the environment. This Function is necessary to prevent the containment design pressure and temperature from being exceeded following any postulated DBA (such as LOCA or SLB).

The operator can initiate Containment Cooling at any time from the main control room by actuating either of the two containment cooling actuation switches. There are two switches in the main control room, either of which will actuate containment cooling in all divisions. Manual Initiation of containment cooling also actuates containment isolation.

The LCO requires this Function to be OPERABLE in MODES 1, 2, 3, and 4 when the potential exists for a DBA that could require the operation of the Passive Containment Cooling System. In MODES 5 and 6, with decay heat more than 6.0 MWt, manual initiation of the PCS provides containment heat removal. Section B 3.6.6, Applicability, provides the basis for the decay heat limit.

9. Passive Residual Heat Removal Heat Exchanger Actuation – Manual Initiation

The PRHR Heat Exchanger (HX) provides emergency core decay heat removal when the Startup Feedwater System is not available to provide a heat sink.

Manual PRHR actuation is accomplished by either of two switches in the main control room. Either switch actuates all four ESFAS Divisions.

This Function is required to be OPERABLE in MODES 1, 2, 3, and 4, and MODE 5 with the RCS pressure boundary intact. This ensures that PRHR can be actuated in the event of a loss of the normal heat removal systems.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

10. Chemical Volume and Control System Makeup Isolation – Manual Initiation

The CVS makeup line**, auxiliary spray line, and letdown purification line are** ~~is~~ isolated following certain events to prevent overfilling of the RCS.

Manual Chemical **and** Volume Control System Makeup Isolation is actuated by either of two switches in the main control room. Either switch closes Chemical Volume Control System ~~Makeup~~ **makeup line, auxiliary spray line, and letdown purification line isolation** valves. The LCO requires two switches to be OPERABLE.

This Function is required to be OPERABLE in MODES 1 through 3, and MODE 4 with the RCS not being cooled by the RNS.

11. Normal Residual Heat Removal System Isolation – Manual Initiation

The RNS suction line is isolated by closing the containment isolation valves to provide containment isolation following an accident

The operator can initiate RNS isolation at any time from the control room by simultaneously actuating two switches in the same actuation set. Because an inadvertent actuation of RNS isolation could have serious consequences, two switches must be actuated simultaneously to initiate isolation. There are two sets of two switches in the control room. Simultaneously actuating the two switches in either set will isolate the RNS in the same manner as the automatic actuation signal. Two Manual Initiation switches in each set are required to be OPERABLE to ensure no single failure disables the Manual Initiation Function.

This Function is required to be OPERABLE in MODES 1, 2, and 3.

12. In-Containment Refueling Water Storage Tank (IRWST) Injection Line Valve Actuation – Manual Initiation

The **Passive Core Cooling System (**PXS**)** provides core cooling by gravity injection and recirculation for decay heat removal following an accident. Manual initiation will generate a signal to open the IRWST injection line and actuate IRWST injection.

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The operator can open IRWST injection line valves at any time from the main control room by actuating two IRWST injection actuation switches in the same actuation set. There are two sets of two switches each in the main control room.

This Function is required to be OPERABLE in MODES 1 through 3, and MODE 4 with the Reactor Coolant System (RCS) not cooled by the Normal Residual Heat Removal System (RNS). Manual actuation of the IRWST injection line valves is additionally required **to be OPERABLE** in MODE 4 when the RCS is being cooled by the RNS, MODE 5, and MODE 6.

13. IRWST Containment Recirculation Valve Actuation – Manual Initiation

The **Passive Core Cooling System (**PXS**)** provides core cooling by gravity injection and recirculation for decay heat removal following an accident. Manual initiation will open these valves.

The operator can open the containment recirculation valves at any time from the main control room by actuating two containment recirculation actuation switches in the same actuation set. There are two sets of two switches each in the main control room.

This Function is required to be OPERABLE in MODES 1 through 3, and MODE 4 with the Reactor Coolant System (RCS) not cooled by the Normal Residual Heat Removal System (RNS). Manual actuation of the IRWST containment recirculation valves is additionally required **to be OPERABLE** in MODE 4 when the RCS is being cooled by the RNS, MODE 5, and MODE 6.

14. SG Power Operated Relief Valve and Block Valve Isolation – Manual Initiation

The Function of the SG Power Operated Relief Valve **(PORV)** and Block Valve Isolation is to ensure that the SG PORV flow paths can be isolated during a SG tube rupture (SGTR) event.

Manual initiation of SG **PORV** ~~Power Operated Relief Valve~~ and Block Valve Isolation can be accomplished from the control room. There are two switches in the control room and either switch can

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

close the SG PORVs and PORV block valves. The LCO requires two switches to be OPERABLE.

This Function is required to be OPERABLE in MODES 1, 2, and 3, and MODE 4 with the RCS cooling not being provided by the RNS. In MODE 4 with the RCS cooling being provided by the RNS the steam generators are not being used for RCS cooling and the potential for a SGTR is minimized due to the reduced mass and energy in the RCS and steam generators.

15. Containment Vacuum Relief Valve Actuation – Manual Initiation

The purpose of the vacuum relief lines is to protect the containment vessel against damage due to a negative pressure (i.e., a lower pressure inside than outside).

The operator can open the vacuum relief valves at any time from the main control room by actuating either of the two vacuum relief actuation switches. There are two switches in the main control room, either of which will actuate vacuum relief in all divisions.

Manual Containment Vacuum Relief Valve actuation must be OPERABLE in MODES 1 through 4 and in MODES 5 and 6 without an open containment air flow path ≥ 6 inches in diameter. With a 6-inch diameter or equivalent containment air flow path, the vacuum relief function is not needed to mitigate a low pressure event.

ESFAS Manual Initiation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

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 3.3.9-1. The Completion Time(s) of the inoperable equipment of a Function will be tracked separately for each Function starting from the time the Condition was entered for that Function.

In the event a channel is not functioning as required, or the Protection and Safety Monitoring System Division, associated with a specific Function is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the LCO Condition(s) entered for the particular protection Function(s) affected.

BASES

ACTIONS (continued)

A.1

Condition A addresses the inoperability of the system level manual initiation capability for the ESF Functions listed in Table 3.3.9-1. With one channel inoperable for one or more Functions, the system level manual initiation capability is reduced below that required to meet single failure criterion. Required Action A.1 requires the manual initiation channel to be restored to OPERABLE status within 48 hours. The specified Completion Time is reasonable considering that the remaining switch or switch set is capable of performing the safety function.

Condition A is modified by a Note stating that this Condition is not applicable to Functions 1, 6, 7, 8, 12, and 13 in MODE 5 or 6.

B.1

As noted, Condition B addresses the inoperability of one channel of **one or more of** Function**s** 1, 6, 7, 8, 12, and 13 when in MODE 5 or 6. With one channel inoperable for one or more **of these** Functions, the system level initiation capability is reduced below that required to meet single failure criterion. Therefore, the required channel must be returned to OPERABLE status within 72 hours. The specified Completion Time is reasonable considering the remaining switch or switch set is capable of performing manual initiation.

C.1

Required Action C.1 directs entry into the appropriate Condition referenced in Table 3.3.9-1. If the Required Action and the associated Completion Time of Condition A or B are not met **or if two channels for one or more Functions are inoperable**, Condition C is entered to provide for transfer to the appropriate subsequent Condition.

D.1 and D.2

If the Required Action and associated Completion Time of Condition A are not met **or if two channels for one or more Functions are inoperable for one or more of Functions 2, 12, 13, and 14 in MODE 1, 2, or 3, or MODE 4 with the RCS not being cooled by the RNS**, the plant must be placed in a MODE in which the likelihood and consequences of an event are minimized. This is accomplished by placing the plant in MODE 3 within 6 hours and in MODE 4 with the RCS

BASES

ACTIONS (continued)

being cooled by the RNS within 24 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner without challenging plant systems.

E.1 and E.2

If the Required Action and associated Completion Time of Condition A are not met **or if two channels for one or more Functions are inoperable**, the plant must be placed in a MODE in which the likelihood and consequences of an event are minimized. This is accomplished by placing the plant in MODE 3 within 6 hours and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner without challenging plant systems.

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

If the Required Action and associated Completion Time of Condition A are not met **or if two channels for one or more Functions are inoperable**, the plant must be placed in a **MODE in which the likelihood and consequences of an event are minimized. Under these circumstances, the affected isolation valves(s) must be declared inoperable immediately. Declaring the affected isolation valve inoperable allows the supported system Actions (i.e., for inoperable valves) to dictate the required measures. The respective isolation valve LCO provides appropriate actions for the inoperable components. This action is in accordance with LCO 3.0.6, which requires that the applicable Conditions and Required Actions for the isolation valves declared inoperable shall be entered in accordance with LCO 3.0.2.** ~~condition where the instrumentation Function for valve isolation is no longer needed. This is accomplished by isolating the affected flow path by the use of at least one closed manual or closed and deactivated automatic valve within 6 hours.~~

~~If the flow path is not isolated within 6 hours the plant must be placed in a MODE in which the LCO does not apply. This is accomplished by placing the plant in MODE 3 within 12 hours and in MODE 4 within 18 hours.~~

BASES

ACTIONS (continued)

~~This action is modified by a Note allowing the flow path(s) to be unisolated intermittently under administrative control. These administrative controls consist of stationing a dedicated operator at the valve controls, who is in continuous communication with the control room. In this way the flow path can be rapidly isolated when a need for flow path isolation is indicated.~~

~~G.1, G.2.1.1, G.2.1.2, and G.2.2~~

~~If the Required Action and associated Completion Time of Condition A are not met the plant must be placed in a condition in which the likelihood and consequences of an event are minimized. This is accomplished by placing the plant in MODE 3 within 6 hours and isolating the affected flow path(s) within 12 hours. To assure that the flow path remains closed, the affected flow path shall be verified to be isolated once per 7 days.~~

~~If the flow path is not isolated within 12 hours the plant must be placed in a MODE in which the LCO does not apply. This is accomplished by placing the plant in MODE 4 with the RCS cooling provided by the RNS within 30 hours. The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner without challenging plant systems.~~

~~This action is modified by a Note allowing the flow path(s) to be unisolated intermittently under administrative control. These administrative controls consist of stationing a dedicated operator at the valve controls, who is in continuous communication with the control room. In this way the flow path can be rapidly isolated when a need for flow path isolation is indicated.~~

~~H.1, H.2.1.1, H.2.1.2, H.2.1.3, and H.2.2~~

~~If the Required Action and associated Completion Time of Condition A are not met, the plant must be placed in a condition in which the likelihood and consequences of an event are minimized. This is accomplished by placing the plant in MODE 3 within 6 hours and in MODE 4 with the RCS cooling provided by the RNS within 24 hours. Once the plant has been placed in MODE 4 the affected flow path must be isolated within 30 hours. To assure that the flow path remains closed, the affected flow path shall be verified to be isolated once per 7 days.~~

BASES

ACTIONS (continued)

~~If the flow path is not isolated within 12 hours, the plant must be placed in a MODE in which the LCO does not apply. This is accomplished by placing the plant in MODE 5 within 42 hours. The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner without challenging plant systems.~~

~~This action is modified by a Note allowing the flow path(s) to be unisolated intermittently under administrative control. These administrative controls consist of stationing a dedicated operator at the valve controls, who is in continuous communication with the control room. In this way the flow path can be rapidly isolated when a need for flow path isolation is indicated.~~

G~~I~~.1 and **G**~~I~~.2

If the Required Action and the associated Completion Time of Condition A are not met **or if two channels for one or more Functions are inoperable for Function 2 in Mode 4 with the RCS being cooled by the RNS, or for one or both of Functions 2 and 9 in MODE 5 with the RCS pressure boundary intact**, ~~and the required switch or switch set is not restored to OPERABLE status within 48 hours,~~ the plant must be placed in a condition in which the likelihood and consequences of an event are minimized. This is accomplished by placing the plant in MODE 5 within 12 hours. Once in MODE 5, action shall be immediately initiated to open the RCS pressure boundary ~~and establish ≥ 20% pressurizer level~~. The 12 hour Completion Time is a reasonable time to reach MODE 5 from MODE 4 with RCS cooling provided by the RNS (approximately 350°F) in an orderly manner without challenging plant systems. Opening the RCS pressure boundary assures that cooling water can be injected without ADS operation. ~~Filling the RCS to provide ≥ 20% pressurizer level minimizes the consequences of a loss of decay heat removal event.~~

H~~J~~.1 and **H**~~J~~.2

If the Required Action and associated Completion Time of Condition B are not met **or if two channels for one or more Functions are inoperable for one or both of Function 6 in MODE 5 with RCS pressure boundary intact and with pressurizer level ≥ 20%, and Function 7 in MODE 5**, the plant must be placed in a MODE in which the likelihood and consequences of an event are minimized. This is

BASES

ACTIONS (continued)

accomplished by immediately initiating action to open the RCS pressure boundary, establish ≥ 20% pressurizer level, and suspending positive reactivity additions. The requirement to open the RCS pressure boundary minimizes the consequences of the loss of decay heat removal by maximizing RCS inventory and maintaining RCS temperature as low as practical. Additionally, the potential for a criticality event is minimized by the immediate suspension of positive reactivity additions.

I~~K~~.1 and I~~K~~.2

If the Required Action and associated Completion Time of Condition B are not met **or if two channels for Function 7 in MODE 6 with upper internals in place are inoperable**, the plant must be placed in a MODE in which the likelihood and consequences of an event are minimized. This is accomplished by immediately initiating action to remove the upper internals and suspend positive reactivity additions. The requirement to initiate action to remove the upper internals minimizes the consequences of the loss of decay heat removal by maximizing RCS inventory and maintaining RCS temperature as low as practical. Additionally, the potential for a criticality event is minimized by the immediate suspension of positive reactivity additions.

J~~L~~.1, J~~L~~.2, and J~~L~~.3

If the Required Action and associated Completion Time of Condition B are not met **or if two channels are inoperable for one or more of Functions 12 and 13 in MODE 4 with the RCS being cooled by the RNS, Function 1 in MODE 5, and Function 8 in MODE 5 with decay heat > 6.0 MWt**, the plant must be placed in a MODE in which the likelihood and consequences of an event are minimized. This is accomplished by placing the plant in MODE 5 within 12 hours (Required Action J~~L~~.2). The 12 hours is a reasonable time to reach MODE 5 with RCS cooling provided by the RNS (approximately 350°F) in an orderly manner without challenging plant systems.

Required Action J~~L~~.3 requires initiation of action within 12 hours to close the RCS pressure boundary and establish ≥ 20% pressurizer level. The 12 hour Completion Time allows transition to MODE 5 in accordance with J~~L~~.2, if needed, prior to initiating action to **close** ~~open~~ the RCS pressure boundary.

BASES

ACTIONS (continued)

Required Action **J~~L~~**.1 minimizes the potential for a criticality event by suspension of positive reactivity additions. Required Actions **J~~L~~**.2 and **J~~L~~**.3 minimize the consequences of a loss of decay heat removal event by optimizing conditions for RCS cooling in MODE 5 using the PRHR HX. Additionally, maximizing RCS inventory and maintaining RCS temperature as low as practical further minimize the consequences of a loss of decay heat removal event. Closing the RCS pressure boundary in MODE 5 assures that PRHR HX cooling is available.

K~~M~~.1 and **K~~M~~**.2

If the Required Action and associated Completion Time of Condition B are not met **or if two channels are inoperable for one or more of Functions 12 and 13 in MODE 6, and Function 8 in MODE 6 with decay heat > 6.0 MWt**, the plant must be placed in a **condition** ~~MODE~~ in which the likelihood and consequences of an event are minimized. This is accomplished by immediately initiating action to establish the reactor cavity water level ≥ 23 feet above the top of the reactor vessel flange (Required Action **K~~M~~**.2) and to suspend positive reactivity additions (Required Action **K~~M~~**.1).

Required Action **K~~M~~**.2 minimizes the consequences of a loss of decay heat removal event by optimizing conditions for RCS cooling in MODE 6 using IRWST injection.

Additionally, maximizing RCS inventory and maintaining RCS temperature as low as practical further minimize the consequences of a loss of decay heat removal event. Additionally, the potential for a criticality event is minimized by suspension of positive reactivity additions.

L~~N~~.1, **L~~N~~**.2, and **L~~N~~**.3

If the Required Action and associated Completion Time of Condition A are not met **or if more than two channels are inoperable for Function 15**, the plant must be placed in a MODE in which the likelihood and consequences of an event are minimized. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

BASES

ACTIONS (continued)

In addition, a containment air flow path ≥ 6 inches in diameter shall be opened within 44 hours from Condition entry. Opening any flow path (or paths) with an area equivalent to 6 inches in diameter provides the required vacuum relief path in the event of a low pressure event.

The primary means of opening a containment air flow path is by establishing a **Containment Air Filtration System (**VFS**)** air flow path into containment. Manual actuation and maintenance as necessary to open a purge supply, purge exhaust, or vacuum relief flow path are available means to open a containment air flow path. In addition, opening of a spare penetration is an acceptable means to provide the necessary flow path. Opening of an equipment hatch or a containment airlock is acceptable. Containment air flow paths opened must comply with LCO 3.6.7, Containment Penetrations.

The 44 hour Completion Time is reasonable for opening a containment air flow path in an orderly manner.

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1

SR 3.3.9.1 is the performance of a TADOT of the manual initiation for the various ESF Functions. This TADOT is performed every 24 months.

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

The SR is modified by a Note that states verification of setpoint is not required, since these functions have no setpoint associated with them.

REFERENCES

1. **FSAR** Chapter 15.0, “Accident **Analyses** ~~Analysis~~.”

XII. Applicable STS Subsection After Incorporation of this GTST's Modifications

The entire subsection of the Specifications and the Bases associated with this GTST, following incorporation of the modifications, is presented next.

3.3 INSTRUMENTATION

3.3.9 Engineered Safety Feature Actuation System (ESFAS) Manual Initiation

LCO 3.3.9 The ESFAS manual initiation channels for each Function in Table 3.3.9-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.9-1.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ----------NOTE---------- Not applicable to Functions 1, 6, 7, 8, 12, and 13 in MODE 5 or 6. --- One or more Functions with one channel inoperable.	A.1 Restore channel to OPERABLE status.	48 hours
B. ----------NOTE---------- Only applicable to Functions 1, 6, 7, 8, 12, and 13 in MODE 5 or 6. --- One or more Functions with one channel inoperable.	B.1 Restore channel to OPERABLE status.	72 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met. OR One or more Functions with two channels inoperable.	C.1 Enter the Condition referenced in Table 3.3.9-1 for the channel(s).	Immediately
D. As required by Required Action C.1 and referenced in Table 3.3.9-1.	D.1 Be in MODE 3. AND D.2 Be in MODE 4 with the Reactor Coolant System (RCS) cooling provided by the Normal Residual Heat Removal System (RNS).	6 hours 24 hours
E. As required by Required Action C.1 and referenced in Table 3.3.9-1.	E.1 Be in MODE 3. AND E.2 Be in MODE 5.	6 hours 36 hours
F. As required by Required Action C.1 and referenced in Table 3.3.9-1.	F.1 Declare affected isolation valve(s) inoperable.	Immediately
G. As required by Required Action C.1 and referenced in Table 3.3.9-1.	G.1 Be in MODE 5. AND	12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
G. (continued)	G.2	Initiate action to open the RCS pressure boundary.	12 hours
H. As required by Required Action C.1 and referenced in Table 3.3.9-1.	H.1	Suspend positive reactivity additions.	Immediately
	AND		
	H.2	Initiate action to open RCS pressure boundary and establish ≥ 20% pressurizer level.	Immediately
I. As required by Required Action C.1 and referenced in Table 3.3.9-1.	I.1	Suspend positive reactivity additions.	Immediately
	AND		
	I.2	Initiate action to remove the upper internals.	Immediately
J. As required by Required Action C.1 and referenced in Table 3.3.9-1.	J.1	Suspend positive reactivity additions.	Immediately
	AND		
	J.2	Be in MODE 5.	12 hours
	AND		
	J.3	Initiate action to establish a pressurizer level ≥ 20% with the RCS pressure boundary intact.	12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
K. As required by Required Action C.1 and referenced in Table 3.3.9-1.	K.1 Suspend positive reactivity additions. AND K.2 Initiate action to establish water level ≥ 23 feet above the top of the reactor vessel flange.	Immediately Immediately
L. As required by Required Action C.1 and referenced in Table 3.3.9-1.	L.1 Be in MODE 3. AND L.2 Be in MODE 5. AND L.3 Open a containment air flow path ≥ 6 inches in diameter.	6 hours 36 hours 44 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	----------NOTE---------- Verification of setpoint not required. ----------	
	Perform TRIP ACTUATING DEVICE OPERATIONAL TEST (TADOT).	24 months

Table 3.3.9-1 (page 1 of 2)
Engineered Safeguards Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS
1. Safeguards Actuation - Manual Initiation	1,2,3,4	2 switches	E
	5	2 switches	J
2. Core Makeup Tank (CMT) Actuation - Manual Initiation	1,2,3,4[a]	2 switches	D
	4[b],5[c]	2 switches	G
3. Containment Isolation - Manual Initiation	1,2,3,4	2 switches	E
4. Steam Line Isolation - Manual Initiation	1,2,3,4	2 switches	F
5. Feedwater Isolation - Manual Initiation	1,2,3,4	2 switches	F
6. Automatic Depressurization System (ADS) Stages 1, 2 & 3 Actuation - Manual Initiation	1,2,3,4	2 switch sets	E
	5[d]	2 switch sets	H
7. ADS Stage 4 Actuation - Manual Initiation	1,2,3,4	2 switch sets	E
	5	2 switch sets	H
	6[e]	2 switch sets	I
8. Passive Containment Cooling Actuation - Manual Initiation	1,2,3,4	2 switches	E
	5[f]	2 switches	J
	6[f]	2 switches	K
9. Passive Residual Heat Removal Heat Exchanger Actuation - Manual Initiation	1,2,3,4	2 switches	E
	5[c]	2 switches	G
10. Chemical Volume and Control System Makeup Isolation - Manual Initiation	1,2,3,4[a]	2 switches	F
11. Normal Residual Heat Removal System Isolation - Manual Initiation	1,2,3	2 switch sets	F

Table 3.3.9-1 (page 2 of 2)
Engineered Safeguards Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS
12. In-Containment Refueling Water Storage Tank (IRWST) Injection Line Valve Actuation - Manual Initiation	1,2,3,4[a]	2 switch sets	D
	4[b],5	2 switch sets	J
	6	2 switch sets	K
13. IRWST Containment Recirculation Valve Actuation - Manual Initiation	1,2,3,4[a]	2 switch sets	D
	4[b],5	2 switch sets	J
	6	2 switch sets	K
14. SG Power Operated Relief Valve and Block Valve Isolation - Manual Initiation	1,2,3,4[a]	2 switches	D
15. Containment Vacuum Relief Valve Actuation - Manual Initiation	1,2,3,4,5[g],6[g]	2 switches	L

(a) With the RCS not being cooled by the Normal Residual Heat Removal System (RNS).

(b) With the RCS being cooled by the RNS.

(c) With the RCS pressure boundary intact.

(d) With the RCS pressure boundary intact and with pressurizer level ≥ 20%.

(e) With upper internals in place.

(f) With decay heat > 6.0 MWt.

(g) Without an open containment air flow path ≥ 6 inches in diameter.

B 3.3 INSTRUMENTATION

B 3.3.9 Engineered Safety Feature Actuation System (ESFAS) Manual Initiation

BASES

BACKGROUND

A description of the ESFAS Instrumentation is provided in the Bases for LCO 3.3.8, “Engineered Safety Feature Actuation System (ESFAS) Instrumentation.”

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

A description of the following ESFAS protective functions is provided in the Bases for LCO 3.3.8:

- Safeguards Actuation
- Core Makeup Tank (CMT) Actuation
- Containment Isolation
- Steam Line Isolation
- Feedwater Isolation
  - Main Feedwater Control Valve Isolation
  - Main Feedwater Pump Trip and Valve Isolation
  - Startup Feedwater Isolation
- Automatic Depressurization System (ADS) Stages 1, 2, & 3 Actuation
- ADS Stage 4 Actuation
- Passive Containment Cooling Actuation
- Passive Residual Heat Removal Heat Exchanger Actuation
- Chemical Volume and Control System Makeup Isolation
- Normal Residual Heat Removal System Isolation

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

- In-Containment Refueling Water Storage Tank (IRWST) Injection Line Valve Actuation
- IRWST Containment Recirculation Valve Actuation
- Steam Generator (SG) Power Operated Relief Valve and Block Valve Isolation
- Containment Vacuum Relief Valve Actuation

The LCO requires OPERABILITY of two devices for each manual initiation Function listed in Table 3.3.9-1. Two manual initiation channels are required to ensure no single random failure disables the ESFAS. The required channels of ESFAS instrumentation provide plant protection in the event of any of the analyzed accidents (Ref. 1). ESFAS manual initiation functions are as follows:

1. Safeguards Actuation – Manual Initiation

   The LCO requires that two manual initiation devices are OPERABLE. The operator can initiate the Safeguards Actuation signal at any time by using either of two switches in the main control room. This action will cause actuation of all components in the same manner as any of the automatic actuation signals.

   The LCO on Safeguards Actuation – Manual Initiation ensures the proper amount of redundancy is maintained in the manual Safeguards actuation circuitry to ensure the operator has manual Safeguards Actuation capability.

   Each device consists of one switch and the interconnecting wiring to all four divisions. Each manual initiation device actuates all four divisions. This configuration does not allow testing at power.

   Manual Safeguards Actuation must be OPERABLE in MODES 1, 2, 3, and 4.

   Manual initiation is required in MODE 5 to support system level initiation.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

This Safeguards Actuation Function is not required to be OPERABLE in MODE 6 because there is adequate time for the operator to evaluate plant conditions and respond by manually starting individual systems, pumps, and other equipment to mitigate the consequences of an abnormal condition or accident. Plant pressure and temperature are very low and many Engineered Safety Features (ESF) components are administratively locked out or otherwise prevented from actuating to prevent inadvertent overpressurization of plant systems.

2. Core Makeup Tank (CMT) Actuation – Manual Initiation

CMT Actuation provides the passive injection of borated water into the RCS. Injection provides RCS makeup water and boration during transients or accidents when the normal makeup supply from the Chemical and Volume Control System (CVS) is lost or insufficient.

Manual CMT Valve Actuation is accomplished by either of two switches in the main control room. Either switch activates all four divisions.

Manual CMT Valve Actuation must be OPERABLE in MODES 1 through 3, and MODE 4 with the Reactor Coolant System (RCS) not cooled by the Normal Residual Heat Removal System (RNS). Manual actuation of the CMT valves is additionally required in MODE 4 when the RCS is being cooled by the RNS, and MODE 5 with the RCS pressure boundary intact. Actuation of this Function is not required in MODE 5 with the RCS pressure boundary open, or MODE 6 because the CMTs are not required to be OPERABLE in these MODES.

3. Containment Isolation – Manual Initiation

Containment isolation is necessary to prevent or limit the release of radioactivity to the environment in the event of a large break LOCA.

Manual Containment Isolation is accomplished by either of two switches in the main control room. Either switch actuates all four ESFAS divisions. Manual initiation of Containment Isolation must be OPERABLE in MODES 1, 2, 3, and 4, when containment integrity is required.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

4. Steam Line Isolation – Manual Initiation

Isolation of the main steam lines provides protection in the event of a Steam Line Break (SLB) inside or outside containment.

Manual initiation of Steam Line Isolation can be accomplished from the main control room. There are two switches in the main control room and either switch can initiate action to immediately close all main steam isolation valves (MSIVs).

The LCO requires two OPERABLE channels in MODES 1, 2, 3, and 4. In MODES 5 and 6, this Function is not required to be OPERABLE because there is insufficient energy in the secondary side of the unit to cause an accident.

5. Feedwater Isolation – Manual Initiation

The primary Function of Feedwater Isolation is to prevent damage to the turbine due to water in the steam lines and to stop the excessive flow of feedwater into the SGs.

Manual Feedwater Isolation can be accomplished from the main control room. There are two switches in the main control room and either switch can initiate action in both divisions to close all main and startup feedwater control, isolation and crossover valves, trip all main and startup feedwater pumps, and trip the turbine.

Feedwater isolation is necessary in MODES 1, 2, 3, and 4 to mitigate the effects of a large SLB or feedwater line break (FLB). In MODES 5 and 6, the energy in the RCS and the steam generators is low and this function is not required to be OPERABLE.

6. ADS Stages 1, 2, & 3 Actuation – Manual Initiation

The Automatic Depressurization System (ADS) provides a sequenced depressurization of the reactor coolant system to allow passive injection from the CMTs, accumulators, and the in-containment refueling water storage tank (IRWST) to mitigate the effects of a LOCA.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The operator can initiate an ADS Stages 1, 2, and 3 actuation from the main control room by simultaneously actuating two ADS actuation devices in the same set. There are two sets of two switches each in the main control room. Simultaneously actuating the two devices in either set will actuate ADS Stages 1, 2, and 3.

This Function must be OPERABLE in MODES 1 through 4, and MODE 5 with the RCS pressure boundary intact and with pressurizer level ≥ 20%. In MODE 5 with the RCS open and in MODE 6, LCO 3.4.13, ADS – Shutdown, RCS Open, required the ADS Stages 1, 2, and 3 valves to be open. Thus, Manual actuation is not required.

7. ADS Stage 4 Actuation – Manual Initiation

The ADS provides a sequenced depressurization of the reactor coolant system to allow passive injection from the CMTs, accumulators, and the IRWST to mitigate the effects of a LOCA.

The fourth stage depressurization valves open on manual actuation. The operator can initiate Stage 4 of ADS from the main control room. There are two sets of two switches each in the main control room. Actuating the two switches in either set will actuate all 4th stage ADS valves. This manual actuation is interlocked to actuate with either the low RCS pressure signal or with the ADS Stages 1, 2, & 3 actuation. These interlocks minimize the potential for inadvertent actuation of this Function. This interlock with the ADS Stages 1, 2, & 3 actuation Function allows manual actuation of this Function if automatic or manual actuation of the ADS Stages 1, 2, & 3 valves fails to depressurize the RCS due to common-mode failure. This consideration is important in PRA modeling to improve the reliability of reducing the RCS pressure following a small LOCA or transient event. This Function must be OPERABLE in MODES 1 through 5, and MODE 6 with the upper internals in place. In MODE 6 with the upper internals not in place, the Stage 4 ADS valves are not required to be OPERABLE by LCO 3.4.13, thus Manual Initiation of the valves is not required.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

8. Passive Containment Cooling Actuation – Manual Initiation

The Passive Containment Cooling System (PCS) transfers heat from the reactor containment to the environment. This Function is necessary to prevent the containment design pressure and temperature from being exceeded following any postulated DBA (such as LOCA or SLB).

The operator can initiate Containment Cooling at any time from the main control room by actuating either of the two containment cooling actuation switches. There are two switches in the main control room, either of which will actuate containment cooling in all divisions. Manual Initiation of containment cooling also actuates containment isolation.

The LCO requires this Function to be OPERABLE in MODES 1, 2, 3, and 4 when the potential exists for a DBA that could require the operation of the Passive Containment Cooling System. In MODES 5 and 6, with decay heat more than 6.0 MWt, manual initiation of the PCS provides containment heat removal. Section B 3.6.6, Applicability, provides the basis for the decay heat limit.

9. Passive Residual Heat Removal Heat Exchanger Actuation – Manual Initiation

The PRHR Heat Exchanger (HX) provides emergency core decay heat removal when the Startup Feedwater System is not available to provide a heat sink.

Manual PRHR actuation is accomplished by either of two switches in the main control room. Either switch actuates all four ESFAS Divisions.

This Function is required to be OPERABLE in MODES 1, 2, 3, and 4, and MODE 5 with the RCS pressure boundary intact. This ensures that PRHR can be actuated in the event of a loss of the normal heat removal systems.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

10. Chemical Volume and Control System Makeup Isolation – Manual Initiation

    The CVS makeup line, auxiliary spray line, and letdown purification line are isolated following certain events to prevent overfilling of the RCS.

    Manual Chemical and Volume Control System Makeup Isolation is actuated by either of two switches in the main control room. Either switch closes Chemical Volume Control System makeup line, auxiliary spray line, and letdown purification line isolation valves. The LCO requires two switches to be OPERABLE.

    This Function is required to be OPERABLE in MODES 1 through 3, and MODE 4 with the RCS not being cooled by the RNS.

11. Normal Residual Heat Removal System Isolation – Manual Initiation

    The RNS suction line is isolated by closing the containment isolation valves to provide containment isolation following an accident

    The operator can initiate RNS isolation at any time from the control room by simultaneously actuating two switches in the same actuation set. Because an inadvertent actuation of RNS isolation could have serious consequences, two switches must be actuated simultaneously to initiate isolation. There are two sets of two switches in the control room. Simultaneously actuating the two switches in either set will isolate the RNS in the same manner as the automatic actuation signal. Two Manual Initiation switches in each set are required to be OPERABLE to ensure no single failure disables the Manual Initiation Function.

    This Function is required to be OPERABLE in MODES 1, 2, and 3.

12. In-Containment Refueling Water Storage Tank (IRWST) Injection Line Valve Actuation – Manual Initiation

    The Passive Core Cooling System (PXS) provides core cooling by gravity injection and recirculation for decay heat removal following an accident. Manual initiation will generate a signal to open the IRWST injection line and actuate IRWST injection.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

The operator can open IRWST injection line valves at any time from the main control room by actuating two IRWST injection actuation switches in the same actuation set. There are two sets of two switches each in the main control room.

This Function is required to be OPERABLE in MODES 1 through 3, and MODE 4 with the Reactor Coolant System (RCS) not cooled by the Normal Residual Heat Removal System (RNS). Manual actuation of the IRWST injection line valves is additionally required to be OPERABLE in MODE 4 when the RCS is being cooled by the RNS, MODE 5, and MODE 6.

13. IRWST Containment Recirculation Valve Actuation – Manual Initiation

The Passive Core Cooling System (PXS) provides core cooling by gravity injection and recirculation for decay heat removal following an accident. Manual initiation will open these valves.

The operator can open the containment recirculation valves at any time from the main control room by actuating two containment recirculation actuation switches in the same actuation set. There are two sets of two switches each in the main control room.

This Function is required to be OPERABLE in MODES 1 through 3, and MODE 4 with the Reactor Coolant System (RCS) not cooled by the Normal Residual Heat Removal System (RNS). Manual actuation of the IRWST containment recirculation valves is additionally required to be OPERABLE in MODE 4 when the RCS is being cooled by the RNS, MODE 5, and MODE 6.

14. SG Power Operated Relief Valve and Block Valve Isolation – Manual Initiation

The Function of the SG Power Operated Relief Valve (PORV) and Block Valve Isolation is to ensure that the SG PORV flow paths can be isolated during a SG tube rupture (SGTR) event.

Manual initiation of SG PORV and Block Valve Isolation can be accomplished from the control room. There are two switches in the control room and either switch can close the SG PORVs and PORV block valves. The LCO requires two switches to be OPERABLE.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

This Function is required to be OPERABLE in MODES 1, 2, and 3, and MODE 4 with the RCS cooling not being provided by the RNS. In MODE 4 with the RCS cooling being provided by the RNS the steam generators are not being used for RCS cooling and the potential for a SGTR is minimized due to the reduced mass and energy in the RCS and steam generators.

15. Containment Vacuum Relief Valve Actuation – Manual Initiation

The purpose of the vacuum relief lines is to protect the containment vessel against damage due to a negative pressure (i.e., a lower pressure inside than outside).

The operator can open the vacuum relief valves at any time from the main control room by actuating either of the two vacuum relief actuation switches. There are two switches in the main control room, either of which will actuate vacuum relief in all divisions.

Manual Containment Vacuum Relief Valve actuation must be OPERABLE in MODES 1 through 4 and in MODES 5 and 6 without an open containment air flow path ≥ 6 inches in diameter. With a 6-inch diameter or equivalent containment air flow path, the vacuum relief function is not needed to mitigate a low pressure event.

ESFAS Manual Initiation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

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 3.3.9-1. The Completion Time(s) of the inoperable equipment of a Function will be tracked separately for each Function starting from the time the Condition was entered for that Function.

In the event a channel is not functioning as required, or the Protection and Safety Monitoring System Division, associated with a specific Function is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the LCO Condition(s) entered for the particular protection Function(s) affected.

BASES

ACTIONS (continued)

A.1

Condition A addresses the inoperability of the system level manual initiation capability for the ESF Functions listed in Table 3.3.9-1. With one channel inoperable for one or more Functions, the system level manual initiation capability is reduced below that required to meet single failure criterion. Required Action A.1 requires the manual initiation channel to be restored to OPERABLE status within 48 hours. The specified Completion Time is reasonable considering that the remaining switch or switch set is capable of performing the safety function.

Condition A is modified by a Note stating that this Condition is not applicable to Functions 1, 6, 7, 8, 12, and 13 in MODE 5 or 6.

B.1

As noted, Condition B addresses the inoperability of one channel of one or more of Functions 1, 6, 7, 8, 12, and 13 when in MODE 5 or 6. With one channel inoperable for one or more of these Functions, the system level initiation capability is reduced below that required to meet single failure criterion. Therefore, the required channel must be returned to OPERABLE status within 72 hours. The specified Completion Time is reasonable considering the remaining switch or switch set is capable of performing manual initiation.

C.1

Required Action C.1 directs entry into the appropriate Condition referenced in Table 3.3.9-1. If the Required Action and the associated Completion Time of Condition A or B are not met or if two channels for one or more Functions are inoperable, Condition C is entered to provide for transfer to the appropriate subsequent Condition.

D.1 and D.2

If the Required Action and associated Completion Time of Condition A are not met or if two channels for one or more Functions are inoperable for one or more of Functions 2, 12, 13, and 14 in MODE 1, 2, or 3, or MODE 4 with the RCS not being cooled by the RNS, the plant must be placed in a MODE in which the likelihood and consequences of an event are minimized. This is accomplished by placing the plant in MODE 3 within 6 hours and in MODE 4 with the RCS being cooled by the RNS

ACTIONS (continued)

within 24 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner without challenging plant systems.

E.1 and E.2

If the Required Action and associated Completion Time of Condition A are not met or if two channels for one or more Functions are inoperable, the plant must be placed in a MODE in which the likelihood and consequences of an event are minimized. This is accomplished by placing the plant in MODE 3 within 6 hours and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner without challenging plant systems.

F.1

If the Required Action and associated Completion Time of Condition A are not met or if two channels for one or more Functions are inoperable, the plant must be placed in a MODE in which the likelihood and consequences of an event are minimized. Under these circumstances, the affected isolation valves(s) must be declared inoperable immediately. Declaring the affected isolation valve inoperable allows the supported system Actions (i.e., for inoperable valves) to dictate the required measures. The respective isolation valve LCO provides appropriate actions for the inoperable components. This action is in accordance with LCO 3.0.6, which requires that the applicable Conditions and Required Actions for the isolation valves declared inoperable shall be entered in accordance with LCO 3.0.2.

G.1 and G.2

If the Required Action and the associated Completion Time of Condition A are not met or if two channels for one or more Functions are inoperable for Function 2 in Mode 4 with the RCS being cooled by the RNS, or for one or both of Functions 2 and 9 in MODE 5 with the RCS pressure boundary intact, the plant must be placed in a condition in which the likelihood and consequences of an event are minimized. This is accomplished by placing the plant in MODE 5 within 12 hours. Once in MODE 5, action shall be immediately initiated to open the RCS pressure boundary. The 12 hour Completion Time is a reasonable time to reach MODE 5 from MODE 4 with RCS cooling provided by the RNS

BASES

ACTIONS (continued)

(approximately 350°F) in an orderly manner without challenging plant systems. Opening the RCS pressure boundary assures that cooling water can be injected without ADS operation.

H.1 and H.2

If the Required Action and associated Completion Time of Condition B are not met or if two channels for one or more Functions are inoperable for one or both of Function 6 in MODE 5 with RCS pressure boundary intact and with pressurizer level ≥ 20%, and Function 7 in MODE 5, the plant must be placed in a MODE in which the likelihood and consequences of an event are minimized. This is accomplished by immediately initiating action to open the RCS pressure boundary, establish ≥ 20% pressurizer level, and suspending positive reactivity additions. The requirement to open the RCS pressure boundary minimizes the consequences of the loss of decay heat removal by maximizing RCS inventory and maintaining RCS temperature as low as practical. Additionally, the potential for a criticality event is minimized by the immediate suspension of positive reactivity additions.

I.1 and I.2

If the Required Action and associated Completion Time of Condition B are not met or if two channels for Function 7 in MODE 6 with upper internals in place are inoperable, the plant must be placed in a MODE in which the likelihood and consequences of an event are minimized. This is accomplished by immediately initiating action to remove the upper internals and suspend positive reactivity additions. The requirement to initiate action to remove the upper internals minimizes the consequences of the loss of decay heat removal by maximizing RCS inventory and maintaining RCS temperature as low as practical. Additionally, the potential for a criticality event is minimized by the immediate suspension of positive reactivity additions.

J.1, J.2, and J.3

If the Required Action and associated Completion Time of Condition B are not met or if two channels are inoperable for one or more of Functions 12 and 13 in MODE 4 with the RCS being cooled by the RNS, Function 1 in MODE 5, and Function 8 in MODE 5 with decay heat > 6.0 MWt, the plant must be placed in a MODE in which the likelihood and consequences of an event are minimized. This is accomplished by

ACTIONS (continued)

placing the plant in MODE 5 within 12 hours (Required Action J.2). The 12 hours is a reasonable time to reach MODE 5 with RCS cooling provided by the RNS (approximately 350°F) in an orderly manner without challenging plant systems.

Required Action J.3 requires initiation of action within 12 hours to close the RCS pressure boundary and establish ≥ 20% pressurizer level. The 12 hour Completion Time allows transition to MODE 5 in accordance with J.2, if needed, prior to initiating action to close the RCS pressure boundary.

Required Action J.1 minimizes the potential for a criticality event by suspension of positive reactivity additions. Required Actions J.2 and J.3 minimize the consequences of a loss of decay heat removal event by optimizing conditions for RCS cooling in MODE 5 using the PRHR HX. Additionally, maximizing RCS inventory and maintaining RCS temperature as low as practical further minimize the consequences of a loss of decay heat removal event. Closing the RCS pressure boundary in MODE 5 assures that PRHR HX cooling is available.

K.1 and K.2

If the Required Action and associated Completion Time of Condition B are not met or if two channels are inoperable for one or more of Functions 12 and 13 in MODE 6, and Function 8 in MODE 6 with decay heat > 6.0 MWt, the plant must be placed in a condition in which the likelihood and consequences of an event are minimized. This is accomplished by immediately initiating action to establish the reactor cavity water level ≥ 23 feet above the top of the reactor vessel flange (Required Action K.2) and to suspend positive reactivity additions (Required Action K.1).

Required Action K.2 minimizes the consequences of a loss of decay heat removal event by optimizing conditions for RCS cooling in MODE 6 using IRWST injection.

Additionally, maximizing RCS inventory and maintaining RCS temperature as low as practical further minimize the consequences of a loss of decay heat removal event. Additionally, the potential for a criticality event is minimized by suspension of positive reactivity additions.

BASES

ACTIONS (continued)

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

If the Required Action and associated Completion Time of Condition A are not met or if more than two channels are inoperable for Function 15, the plant must be placed in a MODE in which the likelihood and consequences of an event are minimized. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

In addition, a containment air flow path ≥ 6 inches in diameter shall be opened within 44 hours from Condition entry. Opening any flow path (or paths) with an area equivalent to 6 inches in diameter provides the required vacuum relief path in the event of a low pressure event.

The primary means of opening a containment air flow path is by establishing a Containment Air Filtration System (VFS) air flow path into containment. Manual actuation and maintenance as necessary to open a purge supply, purge exhaust, or vacuum relief flow path are available means to open a containment air flow path. In addition, opening of a spare penetration is an acceptable means to provide the necessary flow path. Opening of an equipment hatch or a containment airlock is acceptable. Containment air flow paths opened must comply with LCO 3.6.7, Containment Penetrations.

The 44 hour Completion Time is reasonable for opening a containment air flow path in an orderly manner.

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1

SR 3.3.9.1 is the performance of a TADOT of the manual initiation for the various ESF Functions. This TADOT is performed every 24 months.

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

The SR is modified by a Note that states verification of setpoint is not required, since these functions have no setpoint associated with them.

REFERENCES 1. FSAR Chapter 15.0, “Accident Analyses.”