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Your ref: Project Number 740
Our ref: DCP/NRC1865

April 13, 2007

Subject: AP1000 COL Standard Technical Report Submittal of APP-GW-GLR-064, Revision 1

In support of Combined License application pre-application activities, Westinghouse is submitting Revision 1 of AP1000 Standard Combined License Technical Report Number 74A. This report completes and documents, on a generic basis, activities required for COL Information Item 16.1-1 in the AP1000 Design Control Document. Changes to the Design Control Document identified in Technical Report Number 74A, Supplement 1 are intended to be incorporated into FSARs referencing the AP1000 design certification or incorporated into the design certification using supplemental rulemaking if Part 52 is revised to permit revision of the design certification. This report is submitted as part of the NuStart Bellefonte COL Project (NRC Project Number 740). The information included in this report is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification.

The purpose for submittal of this report was explained in a March 8, 2006 letter from NuStart to the U.S. Nuclear Regulatory Commission.

Pursuant to 10 CFR 50.30(b), APP-GW-GLR-064, Revision 1, "AP1000 Generic Technical Specifications Completion, Update on Open Items," Technical Report Number 74A, Supplement 1 is submitted as Enclosure 1 under the attached Oath of Affirmation.

Attachment 2 provides a list of open items addressed in this Technical Report 74A, Supplement 1.

It is expected that when the NRC review of Technical Report Number 74A, Supplement 1 is complete and the remaining open items addressed, COL Information Item 16.1-1 will be considered complete for COL applicants referencing the AP1000 Design Certification.

Questions or requests for additional information related to the content and preparation of this report should be directed to Westinghouse. Please send copies of such questions or requests to the prospective applicants for combined licenses referencing the AP1000 Design Certification. A representative for each applicant is included on the cc: list of this letter.

Westinghouse requests the NRC to provide a schedule for review of this Technical Report within two weeks of its submittal.

D079

Very truly yours,

A. Sterdis, Manager
Licensing and Customer Interface
Regulatory Affairs and Standardization

D. F. Hutchings for

/Attachments

1. "Oath of Affirmation," dated April 13, 2007
2. List of Open Items addressed in this Technical Report Number 74A, Supplement 1

/Enclosure

1. APP-GW-GLR-064, Revision 1, "AP1000 Generic Technical Specifications Completion, Update on Open Items," Technical Report Number 74A, Supplement 1, dated April 2007.

cc:	S. Bloom	- U.S. NRC	1E	1A
	S. Coffin	- U.S. NRC	1E	1A
	G. Curtis	- TVA	1E	1A
	P. Grendys	- Westinghouse	1E	1A
	P. Hastings	- Duke Power	1E	1A
	C. Ionescu	- Progress Energy	1E	1A
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	M. Moran	- Florida Power & Light	1E	1A
	C. Pierce	- Southern Company	1E	1A
	E. Schmiech	- Westinghouse	1E	1A
	G. Zinke	- NuStart/Entergy	1E	1A

ATTACHMENT 1

"Oath of Affirmation"

ATTACHMENT 1

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of:	)
NuStart Bellefonte COL Project	)
NRC Project Number 740	)

APPLICATION FOR REVIEW OF
"AP1000 GENERAL COMBINED LICENSE INFORMATION"
FOR COL APPLICATION PRE-APPLICATION REVIEW

W. E. Cummins, being duly sworn, states that he is Vice President, Regulatory Affairs & Standardization, for Westinghouse Electric Company; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission this document; that all statements made and matters set forth therein are true and correct to the best of his knowledge, information and belief.

W. E. Cummins
Vice President
Regulatory Affairs & Standardization

Subscribed and sworn to
before me this 13th day
of April 2007.

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Debra McCarthy, Notary Public
Monroeville Boro, Allegheny County
My Commission Expires Aug. 31, 2009
Member, Pennsylvania Association of Notaries

Notary Public

ATTACHMENT 2

"List of Open Items Addressed in this Technical Report 74A, Supplement 1"

List of Open Items Addressed in this TR74A, Supplement 1

TSs 3.3.1 and 3.3.2 Digital I&C SRs and Completion Times
TS 3.4.6 Overpressure Report
TS 3.4.14 RCS vent area
TSs 3.6.8 and 3.9.5 VFS Differential Pressure
TS 3.6.9 Bases Containment Floodup Volume, Accident [B], TSP Mass, and TSP Sample Mass
TSs 3.9.5 and 3.9.6 Equipment Hatch Bolts

ENCLOSURE 1

APP-GW-GLR-064, Revision 1

AP1000 Generic Technical Specifications Completion, Update on Open Items

Technical Report Number 74A, Supplement 1

AP1000 DOCUMENT COVER SHEET

TDC: _____ Permanent File: _____ APY: _____

RFS#: _____ RFS ITEM #: _____

AP1000 DOCUMENT NO.	REVISION NO.		ASSIGNED TO
APP-GW-GLR-064	1	Page 1 of 57	W-A. Sterdis

ALTERNATE DOCUMENT NUMBER: TR-74A Supplement 1 WORK BREAKDOWN #:

ORIGINATING ORGANIZATION: Westinghouse Electric Company

TITLE: AP1000 Generic Technical Specifications Completion Update on Open Items

ATTACHMENTS:	DCP #/REV. INCORPORATED IN THIS DOCUMENT REVISION:
CALCULATION/ANALYSIS REFERENCE:	

ELECTRONIC FILENAME	ELECTRONIC FILE FORMAT	ELECTRONIC FILE DESCRIPTION
APP-GW-GLR-064 Rev 1.doc	Microsoft Word	

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LEGAL REVIEW	SIGNATURE/DATE	4/11/07
PATENT REVIEW M.M. Corletti	SIGNATURE/DATE	4-11-07

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REVIEWERS	SIGNATURE/DATE	
VERIFIER C.S. Brockhoff	SIGNATURE/DATE CBrockhoff 4/11/07	VERIFICATION METHOD Verified all pages
AP1000 RESPONSIBLE MANAGER J.W. WINTERS	SIGNATURE*	APPROVAL DATE 04/11/07

* Approval of the responsible manager signifies that document is complete, all required reviews are complete, electronic file is attached and document is released for use.

APP-GW-GLR-064
Revision 1

April 2007

AP1000 Standard Combined License Technical Report
TR-74A Supplement 1

AP1000 Generic Technical Specifications Completion

Update on Open Items

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TABLE OF CONTENTS

1 INTRODUCTION

The purpose of this report is to provide updated technical information for the bracketed items in technical specifications in the AP1000 DCD, as discussed in the Combined License Information in DCD 16.1.1 and in the AP1000 Final Safety Evaluation Report (FSER). Attachment 2 of APP-GW-GLR-064 Revision 0 identified 6 design-related technical items that remained open. This report provides values for these open items.

The pages in this report can directly replace the equivalent pages in APP-GW-GLR-064 Revision 0 and the annotation comments for this report replace those for Revision 0. The only annotation change in this report was for annotation 7 which was revised to reflect an updated AP1000 reference.

1.1 COL INFORMATION ITEM 16.1-1

"DCD 16.1.1 Combined License Information

This set of technical specifications is intended to be used as a guide in the development of the plant-specific technical specifications. Combined License applicants referencing the AP1000 will replace preliminary information provided in brackets [ ] with final plant specific values."

FSER 16.2 (NUREG-1793)

"Technical Specifications (TS)

In some instances, detailed design information, equipment selection, allowable values, or other information are needed to establish the information to be included in the TS. Locations for the addition of this information are signified by brackets to indicate that the combined license (COL) applicant must provide plant-specific values or alternative text. This is COL Action Item 16.2-1."

1.2 GENERAL

This report provides final information for bracketed items identified as open in Attachment 2 of APP-GW-064 Revision 0. These changes along with those identified in Revision 0 of this report will be incorporated in Revision 16 of the DCD. This will reduce the number of Information items required by COL Information Item 16.1-1.

Appendix A Supplement 1 contains markups of the updated pages.

Replace the annotations in APP-GW-GEE-064 Revision 1 with the following annotations. They are identical with those used in Revision 0 of this report except that annotation 7 was revised.

The markups in Appendix A Supplement 1 are annotated with the following:

(1) The preliminary information contained in the brackets has been replaced with the final information and is based on system design specifications, approved engineering calculation notes and/or verified analysis input assumptions.

(2) The preliminary information has been replaced with the final information and is based on WCAP-15025-P-A.

(3) Not used.

(4) The preliminary information has been replaced with the final information and is based on engineering judgment.

(5) The preliminary information has been replaced with the final information and is based on the design capability of the system.

(6) The preliminary information has been replaced with the final information and is based on historical relationships between the no load operating temperature (557°F), the minimum temperature for criticality (551°F), and the limit for MODE 2 physics testing (541°F).

(7) ~~The preliminary information is still under evaluation and will be provided during the NRC review.~~
APP-GW-GSC-020, "I&C Technical Specification Completion Time and Surveillance Frequency Justification" provides the basis for the information provided in the brackets.

(8) The preliminary information has been replaced with the updated information and is based on WCAP-16361-P.

(9) Not used.

(10) The preliminary information has been replaced with the updated information and is based on WCAP-16361-P indication uncertainty for pressurizer level indication.

11 The preliminary information will be retained in brackets until a plant specific value can be determined using as built information.

12 The preliminary information has been replaced with final information and is based on the response to NRC RAI 440.106.

13 The preliminary information is no longer applicable due to a planned design change. Replacement pages will be provided later in a separate report to address technical specifications impacted by design changes.

14 The preliminary information shown in the brackets has changed to be consistent with TS 3.8.7 Action B.2.

15 Not used.

16 Not used.

17 The site specific information will be provided by the specific COL Applicant in the Plant Specific Technical Specifications for that applicant. Any reviewer's notes should be removed at that time

18 The preliminary information has been replaced with final information and is based on the the nominal RCS pressure design of AP1000 and the requirements for test pressures identified in ASME OM Code ISTC-3630(b).

1.3 REGULATORY IMPACT

A. FSER IMPACT

The AP1000 Generic Technical Specifications are discussed in Chapter 16 of the NRC Final Safety Evaluation Report (FSER). The write-up describing the development of the technical specification and the NRC review are not impacted by the changes to the technical specifications identified in Appendix A. The changes in APP-GW-GLR-064 Appendix A include completion of the majority of the preliminary information identified in brackets in the technical specifications. The information not provided at this time is generally information that cannot be provided until as-built information is available or is related to plant specific site location and organization. The changes proposed in Appendix A will not impact the FSER conclusion that the proposed AP1000 technical specifications are consistent with the regulatory guidance contained in the standard technical specifications.

B. EVALUATION OF DEPARTURE FROM TIER 2 INFORMATION

(Check correct response and provide justification for that determination under each response)

10 CFR Part 52, Appendix D, Section VIII.B.5.a. provides that an applicant for a combined licensee who references the AP1000 design certification may depart from Tier 2 information, without prior NRC approval, if it does not require a license amendment under paragraph B.5.b. The questions below address the criteria of B.5.b.

1. Does the proposed departure result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the plant-specific DCD?

   The technical specification changes described in APP-GW-GLR-064 will not increase the frequency of occurrence of an accident because there is no significant increase in the probability of failure of the initiation, performance, and pressure boundary integrity design functions of the reactor coolant system and engineered safety features.

2. Does the proposed departure result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety and previously evaluated in the plant-specific DCD?

   The technical specification changes described in APP-GW-GLR-064 do not affect the initiation, performance, and pressure boundary integrity design functions of the reactor coolant system and engineered safety features, therefore there is no increase in the probability of malfunctions of these safety functions.

3. Does the proposed departure result in more than a minimal increase in the consequences of an accident previously evaluated in the plant-specific DCD?

   The technical specification changes described in APP-GW-GLR-064 have no effect on the initiation, performance, and pressure boundary integrity design functions of the reactor coolant system and engineered safety features and will not increase the release of radioactivity during a postulated accident. Therefore, there is no impact on the consequences of an accident.

4. Does the proposed departure result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the plant-specific DCD?

The technical specification changes described in APP-GW-GLR-064 will not impact the initiation, performance, and pressure boundary integrity design functions of the reactor coolant system and engineered safety features and will not increase the release of radioactivity during a postulated malfunction of an SSC. Therefore, there is no increase the consequences of a malfunction of an SSC important to safety.

5. Does the proposed departure create a possibility for an accident of a different type than any evaluated previously in the plant-specific DCD?

   No, the technical specification changes described in APP-GW-GLR-064 will not impact the response of the reactor coolant system or engineered safety features to postulated accident conditions. The changes also do not introduce any additional failure modes. Therefore, these changes will not result in an accident of a type different than what has already been evaluated in the DCD.

6. Does the proposed departure create a possibility for a malfunction of an SSC important to safety with a different result than any evaluated previously in the plant-specific

   No, the technical specification changes described in APP-GW-GLR-064 will not result in any impact to the safety functions of the initiation, performance, and pressure boundary integrity design functions of the reactor coolant system and engineered safety features, and therefore there it will not impact a malfunction of an SSC to cause a different result than what has been evaluated previously.

7. Does the proposed departure result in a design basis limit for a fission product barrier as described in the plant-specific DCD being exceeded or altered

   No, the technical specification changes described in APP-GW-GLR-064 will not result in any impact to initiation, performance, and pressure boundary integrity design functions of the reactor coolant system and engineered safety features and thus will not result in a design basis limit for a fission product barrier being exceeded.

8. Does the proposed departure result in a departure from a method of evaluation described in the plant-specific DCD used in establishing the design bases or in the safety analyses

   No, the technical specification changes described in APP-GW-GLR-064 will not alter the methodology used in verifying initiation, performance, and pressure boundary integrity design functions of the reactor coolant system and engineered safety features, or in performing the safety analyses.

The answers to the evaluation questions above are "NO" and the proposed departure from Tier 2 does not require prior NRC review to be included in plant specific FSARs as provided in 10 CFR Part 52, Appendix D, Section VIII. B.5.b

C. IMPACT ON RESOLUTION OF A SEVERE ACCIDENT ISSUE

10 CFR Part 52, Appendix D, Section VIII. B.5.a. provides that an applicant for a combined licensee who references the AP1000 design certification may depart from Tier 2 information, without prior NRC approval, if it does not require a license amendment under paragraph B.5.c. The questions below address the criteria of B.5.c.

1. Does the proposed activity result in an impact on features that mitigate severe accidents.

No, the technical specification changes described in APP-GW-GLR-064 will not have an impact on the initiation, performance, and pressure boundary integrity design functions of the reactor coolant system and engineered safety features or any features that mitigate severe accidents.

The answers to the evaluation questions above are "NO" or are not applicable and the proposed departure from Tier 2 does not require prior NRC review to be included in plant specific FSARs as provided in 10 CFR Part 52, Appendix D, Section VIII. B.5.c

D. SECURITY ASSESSMENT

Does the proposed change have an adverse impact on the security assessment of the AP1000.

No, the technical specification completion described in APP-GW-GLR-064 will not alter barriers or alarms that control access to protected areas of the plant. The changes to the technical specifications will not alter requirements for security personnel.

DCD Mark-ups

Appendix A contains the markups of the Specifications and Bases associated with the information item discussed below.

Revise COL Information Item 16.1-1 in Subsection 16.1.1 as follows:

Combined License Information

This set of technical specifications is intended to be used as a guide in the development of the plant-specific technical specifications. The preliminary information originally provided in brackets [ ] has been revised with updated information (Reference 1, APP-GW-GLR-064 Revision 0 and Reference 3 APP-GW-GLR-064 Revision 1). Combined License applicants referencing the AP1000 will be required to provide the final information for the remaining brackets [ ] with final plant specific information.

Add the following reference to DCD Section 16.1

16.1.2 References

1. APP-GW-GLR-064, Revision 0, "AP1000 Generic Technical Specifications Completion," November 2006.

2. APP-GW-GLN-075, Revision 0, "AP1000 Generic Technical Specifications for Design Changes," March 2007.

3. APP-GW-GLR-064, Revision 1, "AP1000 Generic Technical Specifications Completion," April 2007.

APPENDIX A

Supplement 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or two Power Range Neutron Flux – High channels inoperable.	D.1.1 Reduce THERMAL POWER to ≤ 75% RTP. AND	12 hours
	D.1.2 Place one inoperable channel in bypass or trip. AND	~~[6]~~ hours (7)
	D.1.3 With two inoperable channels, place one channel in bypass and one channel in trip. OR	~~[6]~~ hours (7)
	D.2.1 Place inoperable channel(s) in bypass. AND	~~[6]~~ hours (7)
	--- **- NOTE -** Only required to be performed when OPDMS is inoperable and the Power Range Neutron Flux input to QPTR is inoperable. ---	
	D.2.2 Perform SR 3.2.4.2 (QPTR verification). OR	Once per 12 hours
	D.3 Be in MODE 3.	12 hours
E. One or two channels inoperable.	E.1.1 Place one inoperable channel in bypass or trip. AND	~~[6]~~ hours (7)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
	E.1.2	With two channels inoperable, place one channel in bypass and one channel in trip.	[6] hours (7)
	OR		
	E.2	Be in MODE 3.	12 hours
F. THERMAL POWER between P-6 and P-10, one or two Intermediate Range Neutron Flux channels inoperable.	F.1.1	Place one inoperable channel in bypass or trip.	[2] hours (7)
	AND		
	F.1.2	With two channels inoperable, place one channel in bypass and one channel in trip.	[2] hours (7)
	OR		
	F.2	Reduce THERMAL POWER to < P-6.	2 hours
	OR		
	F.3	Increase THERMAL POWER to > P-10.	2 hours
G. THERMAL POWER between P-6 and P-10, three Intermediate Range Neutron Flux channels inoperable.	G.1	Suspend operations involving positive reactivity additions.	Immediately
	AND		
	G.2	Reduce THERMAL POWER to < P-6.	2 hours
H. THERMAL POWER < P-6, one or two Intermediate Range Neutron Flux channels inoperable.	H.1	Restore three of four channels to OPERABLE status.	Prior to increasing THERMAL POWER to > P-6

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. One or two Source Range Neutron Flux channels inoperable.	I.1 Suspend operations involving positive reactivity additions.	Immediately
J. Three Source Range Neutron Flux channels inoperable.	J.1 Open RTBs.	Immediately
K. One or two channels inoperable.	K.1.1 Place one inoperable channel in bypass or trip. AND K.1.2 With two channels inoperable, place one channel in bypass and one channel in trip. OR K.2 Reduce THERMAL POWER to < P-10.	[6] hours (7) [6]-hours (7) 12 hours
L. One or two channels inoperable. (B5)	L.1.1 Place one inoperable channel in bypass or trip. AND L.1.2 With two channels inoperable, place one channel in bypass and one channel in trip. OR L.2 Reduce THERMAL POWER to < P-810.	[6] hours (7) [6] hours (7) 10 hours
M. One or two channels/ divisions inoperable.	M.1 Restore three of four channels/divisions to OPERABLE status. OR M.2 Be in MODE 3.	6 hours 12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
N. One or two interlock channels inoperable.	N.1 Verify the interlocks are in required state for existing plant conditions.	1 hour
	OR	
	N.2.1 Place the Functions associated with one inoperable interlock channel in bypass or trip.	[7] hours (7)
	AND	
	N.2.2 With two interlock channels inoperable, place the Functions associated with one inoperable interlock channel in bypass and with one inoperable interlock channel in trip.	[7] hours (7)
	OR	
	N.3 Be in MODE 3.	13 hours
O. One or two interlock channels inoperable.	O.1 Verify the interlocks are in required state for existing plant conditions.	1 hour
	OR	
	O.2.1 Place the Functions associated with one inoperable interlock channel in bypass.	[7] hours (7)
	AND	

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
	O.2.2	With two interlock channels inoperable, place the Functions associated with one inoperable interlock channel in bypass and with one inoperable interlock channel in trip.	~~[7]~~ hours (7)
	OR		
	O.3	Be in MODE 2.	13 hours
P. One division inoperable.	P.1	Open RTBs in inoperable division.	8 hours
	OR		
	P.2.1	Be in MODE 3, 4, or 5.	14 hours
	AND		
	P.2.2	Open RTBs.	14 hours
Q. Two divisions inoperable.	Q.1	Restore three of four divisions to OPERABLE status.	1 hour
	OR		
	Q.2.1	Be in MODE 3, 4, or 5.	7 hours
	AND		
	Q.2.2	Open RTBs.	7 hours
R. One or two channels/ divisions inoperable.	R.1	Restore three of four channels/divisions to OPERABLE status.	48 hours
	OR		
	R.2	Open RTBs.	49 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
S. One or two Source Range Neutron Flux channel inoperable.	S.1 Restore three of four channels to OPERABLE status.	[48] hours (7)
	OR	
	S.2 Open RTBs.	[49] hours (7)
T. Required Source Range Neutron Flux channel inoperable.	T.1 Suspend operations involving positive reactivity additions.	Immediately
	AND	
	T.2 Close unborated water source isolation valves.	1 hour
	AND	
	T.3 Perform SR 3.1.1.1.	1 hour AND Once per 12 hours thereafter

SURVEILLANCE REQUIREMENTS

- NOTE -

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

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	12 hours

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.4	---------- **- NOTE -** Required to be met within 24 hours after reaching 50% RTP. ---------- Calibrate excore channels to agree with incore detector measurements.	92 EFPD
SR 3.3.1.5	---------- **- NOTE -** This Surveillance must be performed on both reactor trip breakers associated with a single division. ---------- Perform TADOT.	92 days on a STAGGERED TEST BASIS
SR 3.3.1.6	---------- **- NOTE -** Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. ---------- Perform RTCOT.	(7) ~~[92] days~~24 months

3.3 INSTRUMENTATION

3.3.2 Engineered Safety Feature Actuation System (ESFAS) Instrumentation

LCO 3.3.2 The ESFAS instrumentation for each function in Table 3.3.2-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.2-1.

ACTIONS

- NOTES -

1. Separate condition entry is allowed for each Function.
2. The Conditions for each Function are given in Table 3.3.2-1. If the Required Actions and associated Completion Times of the first Condition are not met, refer to the second Condition.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels or divisions inoperable.	A.1 Enter the Condition referenced in Table 3.3.2-1 for the channel(s) or division(s).	Immediately
B. One or two channels or divisions inoperable.	B.1 Place one inoperable channel or division in bypass or trip. AND	~~[6]~~ hours (7)
	B.2 With two inoperable channels or divisions, place one inoperable channel or division in bypass and one inoperable channel or division in trip.	~~[6]~~ hours (7)
C. One channel inoperable.	C.1 Place inoperable channel in bypass.	~~[6]~~ hours (7)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One required division inoperable.	D.1 Restore required division to OPERABLE status.	6 hours
E. One switch or switch set inoperable.	E.1 Restore switch and switch set to OPERABLE status.	48 hours
F. One channel inoperable.	F.1 Restore channel to OPERABLE status. OR F.2.1 Verify alternate radiation monitors are OPERABLE. AND F.2.2 Verify control room isolation and air supply initiation manual controls are OPERABLE.	72 hours 72 hours 72 hours
G. One switch, switch set, channel, or division inoperable.	G.1 Restore switch, switch set, channel, and division to OPERABLE status.	72 hours
H. One channel inoperable.	H.1 Place channel in trip.	6 hours
I. One or two channels inoperable.	I.1 Place one inoperable channel in bypass or trip. AND I.2 With two inoperable channels, place one channel in bypass and one channel in trip.	~~[6]~~ hours (7) ~~[6]~~ hours (7)
J. One or two interlock channels inoperable.	J.1 Verify the interlocks are in the required state for the existing plant conditions. OR	1 hour

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
	J.2.1	Place the Functions associated with one inoperable interlock channel in bypass or trip.	[7] hours (7)
	AND		
	J.2.2	With two interlock channels inoperable, place the Functions associated with one inoperable interlock channel in bypass and with one inoperable interlock channel in trip.	[7] hours (7)
K. Required Action and associated Completion Time not met.	K.1	---------- **- NOTE -** LCO 3.0.8 is not applicable. ---------- Suspend movement of irradiated fuel assemblies.	Immediately
L. Required Action and associated Completion Time not met.	L.1	Be in MODE 3.	6 hours
M. Required Action and associated Completion Time not met.	M.1	Be in MODE 3.	6 hours
	AND		
	M.2	Be in MODE 4.	12 hours
N. Required Action and associated Completion Time not met.	N.1	Be in MODE 3.	6 hours
	AND		
	N.2	Be in MODE 4 with the RCS cooling provided by the RNS.	24 hours

SURVEILLANCE REQUIREMENTS

- NOTE -

Refer to Table 3.3.2-1 to determine which SRs apply for each Engineered Safety Features (ESF) Function.

	SURVEILLANCE	FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.2.2	Perform ACTUATION LOGIC TEST.	92 days on a STAGGERED TEST BASIS
SR 3.3.2.3	**- NOTE -** Verification of setpoint not required for manual initiation functions. Perform TRIP ACTUATING DEVICE OPERATIONAL TEST (TADOT).	24 months
SR 3.3.2.4	**- NOTE -** This surveillance shall include verification that the time constants are adjusted to the prescribed values. Perform CHANNEL CALIBRATION.	24 months
SR 3.3.2.5	Perform CHANNEL OPERATIONAL TEST (COT).	~~[92] days~~24 months (7)
SR 3.3.2.6	Verify ESFAS RESPONSE TIMES are within limit.	24 months on a STAGGERED TEST BASIS
SR 3.3.2.7	**- NOTE -** This Surveillance is not required to be performed for actuated equipment which is included in the Inservice Test (IST) Program. Perform ACTUATION DEVICE TEST.	24 months
SR 3.3.2.8	Perform ACTUATION DEVICE TEST for squib valves.	24 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.14 Low Temperature Overpressure Protection (LTOP) System

LCO 3.4.14 At least one of the following Overpressure Protection Systems shall be OPERABLE, with the accumulators isolated:

a. The Normal Residual Heat Removal System (RNS) suction relief valve, or

1

b. The RCS depressurized and an RCS vent of ≥ [~~9.34~~.15] square inches.

- NOTE -

When the RCS temperature is ≥ 200°F, a reactor coolant pump (RCP) may not be started if the pressurizer level is ≥ 92%.

APPLICABILITY: MODE 4 when any cold leg temperature is ≤ 275°F,
MODE 5,
MODE 6 when the reactor vessel head is on.

- NOTE -

Accumulator isolation is only required when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. An accumulator not isolated when the accumulator pressure is ≥ to the maximum RCS pressure for existing cold leg temperature allowed in the PTLR.	A.1 Isolate affected accumulator.	1 hour

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	B.1	Increase RCS cold leg temperature to a level acceptable for the existing accumulator pressure allowed in the PTLR.	12 hours
	OR		
	B.2	Depressurize affected accumulator to less than the maximum RCS pressure for existing cold leg temperature allowed in the PTLR.	12 hours
C. The RNS suction relief valve inoperable.	C.1	Restore the RNS suction relief valve to OPERABLE status.	12 hours
	OR		
(1)	C.2	Depressurize RCS and establish RCS vent of ≥ [~~9.34~~.15] square inches.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.14.1	Verify each accumulator is isolated.	12 hours
SR 3.4.14.2	Verify both RNS suction isolation valves in one RNS suction flow path are open.	12 hours

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.14.3	---------- **- NOTE -** Only required to be performed when complying with LCO 3.4.14.b. ----------	
(1)	Verify RCS vent ≥ ~~[9.34~~.15~~]~~ square inches is open.	12 hours for unlocked-open vent AND 31 days for locked-open vent
SR 3.4.14.4	Verify the lift setting of the RNS suction relief valve.	In accordance with the Inservice Testing Program

3.6 CONTAINMENT SYSTEMS

3.6.8 Containment Penetrations

LCO 3.6.8 The containment penetrations shall be in the following status:

(1)

a. The equipment hatches closed and held in place by ~~[four]~~ bolts or, if open, clear of obstructions such that the hatches can be closed prior to steaming into the containment.

b. One door in each air lock closed or, if open, the containment air locks shall be clear of obstructions such that they can be closed prior to steaming into the containment.

c. The containment spare penetrations, if open, shall be clear of obstructions such that the penetrations can be closed prior to steaming into the containment.

d. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:

1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or

2. capable of being closed by an OPERABLE Containment Isolation signal.

APPLICABILITY: MODES 5 and 6.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Restore containment penetrations to required status.	1 hour

3.6 CONTAINMENT SYSTEMS

3.6.9 pH Adjustment

(1) LCO 3.6.9 The pH adjustment baskets shall contain ≥ [560] ft^3 of trisodium phosphate (TSP).

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The volume of trisodium phosphate not within limit.	A.1 Restore volume of trisodium phosphate to within limit.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
(1) SR 3.6.9.1	Verify that the pH adjustment baskets contain at least [560] ft^3 of TSP (Na_3PO_4-12 H_2O).	24 months
SR 3.6.9.2	Verify that a sample from the pH adjustment baskets provides adequate pH adjustment of the post-accident water.	24 months

3.9 REFUELING OPERATIONS

3.9.5 Containment Penetrations

LCO 3.9.5 The containment penetrations shall be in the following status:

(1)

a. The equipment hatches closed and held in place by ~~[~~four~~]~~ bolts or, if open, the containment air filtration system (VFS) shall be OPERABLE and operating;

b. One door in each air lock closed or, if open, the VFS shall be OPERABLE and operating;

c. The containment spare penetrations closed or, if open, the VFS shall be OPERABLE and operating;

d. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:

1. Closed by a manual or automatic isolation valve, blind flange, or equivalent, or

2. Capable of being closed by an OPERABLE Containment Isolation signal.

- NOTE -

Penetration flow path(s) providing direct access from the containment atmosphere to the outside atmosphere may be unisolated under administrative controls.

APPLICABILITY: During movement of irradiated fuel assemblies within containment.

ACTIONS

- NOTE -

LCO 3.0.8 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Suspend movement of irradiated fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.5.1	Verify each required containment penetration is in the required status.	7 days
SR 3.9.5.2	---------- **- NOTE-** Not required to be met for containment purge and exhaust valve(s) in penetrations closed to comply with LCO 3.9.4.d.1. ---------- Verify each required containment purge and exhaust valve actuates to the isolation position on a manual actuation signal.	In accordance with the Inservice Test Program
SR 3.9.5.3	Verify the VFS can maintain a negative pressure (≤ ~~[~~-0.125~~]~~ inches water gauge relative to outside atmospheric pressure) in the area enclosed by the containment and alternate barrier.	24 months
SR 3.9.5.4	Operate each VFS train for ≥ 10 continuous hours with the heaters operating.	Within 31 days prior to fuel movement or CORE ALTERATIONS

1

3.9 REFUELING OPERATIONS

3.9.6 Containment Air Filtration System (VFS)

LCO 3.9.6 One VFS exhaust subsystem shall be OPERABLE.

APPLICABILITY: During movement of irradiated fuel assemblies in the fuel building.

ACTIONS

- NOTE -

LCOs 3.0.3 and 3.0.8 are not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required VFS exhaust subsystem inoperable.	A.1 Suspend movement of irradiated fuel assemblies in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.6.1	Operate each VFS exhaust subsystem for $\geq$ 10 continuous hours with the heaters operating.	Within 31 days prior to fuel movement
SR 3.9.6.2	Verify the VAS fuel handling area subsystem aligns to the VFS exhaust subsystem on an actual or simulated actuation signal.	24 months
SR 3.9.6.3	Verify one VFS exhaust subsystem can maintain a negative pressure ($\leq$ [-0.125] inches water gauge relative to outside atmospheric pressure) in the fuel handling area.	24 months

(1)

BASES

ACTIONS (continued)

(7)

With one or two channels inoperable, one affected channel must be placed in a bypass or trip condition within ~~[6] hours~~6 hours. If one channel is bypassed, the logic becomes two-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) If one channel is tripped, the logic becomes one-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) If one channel is bypassed and one channel is tripped, the logic becomes one-out-of-two, while still meeting the single failure criterion. The ~~[6] hours~~6 hours allowed to place the inoperable channel(s) in the bypassed or tripped condition is justified in ~~Reference [7]~~Reference 7.

In addition to placing the inoperable channel(s) in the bypassed or tripped condition, THERMAL POWER must be reduced to ≤ 75% RTP within 12 hours. Reducing the power level prevents operation of the core with radial power distributions beyond the design limits. With one or two of the PMS power range detectors inoperable, partial radial power distribution monitoring capability is lost. However, the protective function would still function even with a single failure of one of the two remaining channels.

As an alternative to reducing power, the inoperable channel(s) can be placed in the bypassed or tripped condition within 6 hours and the QPTR monitored every 12 hours as per SR 3.2.4.2, QPTR verification. Calculating QPTR compensates for the lost monitoring capability and allows continued plant operation at power levels > 75% RTP. The 12 hour Frequency is consistent with LCO 3.2.4, "QUADRANT POWER TILT RATIO (QPTR)."

Required Action D.2.2 has been modified by a Note which only requires SR 3.2.4.2 to be performed if OPDMS and the Power Range Neutron Flux input to QPTR become inoperable. Power distribution limits are normally verified in accordance with LCO 3.2.5, "OPDMS - Monitored Power Distribution Parameters." However, if OPDMS becomes inoperable, then LCO 3.2.4, "QUADRANT POWER TILT RATIO (QPTR)," becomes applicable. Failure of a component in the Power Range Neutron Flux Channel which renders the High Flux Trip Function inoperable may not affect the capability to monitor QPTR. If either OPDMS or the channel input to QPTR is OPERABLE, then performance of SR 3.2.4.2 once per 12 hours is not necessary.

As an alternative to the above Actions, the plant must be placed in a MODE where this Function is no longer required OPERABLE. Twelve hours are allowed to place the plant in MODE 3. This is a

ACTIONS (continued)

reasonable time, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging plant systems. If Required Actions cannot be completed within their allowed Completion Times, LCO 3.0.3 must be entered.

E.1.1, E.1.2, and E.2

Condition E applies to the following reactor trip Functions:

- Power Range Neutron Flux – Low;
- Overtemperature ΔT;
- Overpower ΔT;
- Power Range Neutron Flux – High Positive Rate;
- Pressurizer Pressure – High;
- SG Water Level – Low; and
- SG Water Level – High 2.

(7)

With one or two channels inoperable, one affected channel must be placed in a bypass or trip condition within ~~[6] hours~~6 hours. If one channel is bypassed, the logic becomes two-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) If one channel is tripped, the logic becomes one-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) If one channel is bypassed and one channel is tripped, the logic becomes one-out-of-two, while still meeting the single failure criterion. The ~~[6] hours~~6 hours allowed to place the inoperable channel(s) in the bypassed or tripped condition is justified in ~~Reference [7]~~Reference 7.

If the Required Actions described above cannot be met within the specified Completion Times, the unit must be placed in a MODE where this Function is no longer required to be OPERABLE. An additional 6 hours is allowed to place the unit in MODE 3. Six hours is a reasonable time, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging plant systems.

BASES

ACTIONS (continued)

F.1.1, F.1.2, F.2, and F.3

Condition F applies to the Intermediate Range Neutron Flux trip when above the P-6 setpoint and below the P-10 setpoint. Above the P-6 setpoint and below the P-10 setpoint, the PMS intermediate range detector performs the monitoring functions.

(7)

With one or two channels inoperable, one affected channel must be placed in a bypass or trip condition within [2] hours. If one channel is bypassed, the logic becomes two-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) If one channel is tripped, the logic becomes one-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) If one channel is bypassed and one channel is tripped, the logic becomes one-out-of-two, while still meeting the single failure criterion. The [2] hours allowed to place the inoperable channel(s) in the bypassed or tripped condition is justified in ~~Reference [7]~~Reference 7.

As an alternative to placing the channel(s) in bypass or trip if THERMAL POWER is greater than the P-6 setpoint but less than the P-10 setpoint, 2 hours are allowed to reduce THERMAL POWER below the P-6 setpoint or to increase the THERMAL POWER above the P-10 setpoint. The PMS Intermediate Range Neutron Flux channels must be OPERABLE when the power level is above the capability of the source range, P-6, and below the capability of the power range, P-10. If THERMAL POWER is greater than the P-10 setpoint, the PMS power range detectors perform the monitoring and protective functions and the intermediate range is not required. The Completion Times allow for a slow and controlled power adjustment below P-6, and takes into account the redundant capability afforded by the two remaining OPERABLE channels and the low probability of their failure during this period.

G.1 and G.2

Condition G applies to three Intermediate Range Neutron Flux trip channels inoperable in MODE 2 above the P-6 setpoint and below the P-10 setpoint. Required Actions specified in this Condition are only applicable when channel failures do not result in reactor trip. Above the P-6 setpoint and below the P-10 setpoint, the PMS intermediate range detector performs the monitoring Functions. With only one intermediate range channel OPERABLE, the Required Actions are to suspend operations involving positive reactivity additions immediately. This will preclude any power level increase since there are insufficient

BASES

ACTIONS (continued)

K.1.1, K.1.2, and K.2

Condition K applies to the following reactor trip Functions:

- Pressurizer Pressure – Low;
- Pressurizer Water Level – High 3;
- Reactor Coolant Flow – Low (Both Hot Legs);
- RCP Bearing Water Temperature – High (Two Pumps); and
- RCP Speed – Low.

7

With one or two channels inoperable, one affected channel must be placed in a bypass or trip condition within ~~[6] hours~~6 hours. If one channel is bypassed, the logic becomes two-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) If one channel is tripped, the logic becomes one-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) If one channel is bypassed and one channel is tripped, the logic becomes one-out-of-two, while still meeting the single failure criterion. The ~~[6] hours~~6 hours allowed to place the inoperable channel(s) in the bypassed or tripped condition is justified in ~~Reference [7]~~Reference 7.

If Required Actions described above cannot be met within the specified Completion Times, the unit must be placed in a MODE where this Function is no longer required to be OPERABLE. A Completion Time of an additional 6 hours is allowed to reduce power < P-10. Allowance of this time interval takes into consideration the redundant capability provided by the remaining two redundant OPERABLE channels and the low probability of occurrence of an event during this period that may require the protection afforded by the Functions associated with Condition K.

B5

L.1.1, L.1.2, and L.2

Condition L is applicable to the Reactor Coolant Flow – Low ~~(Single Cold Leg)~~ and RCP Bearing Water Temperature – High ~~(Single Pump)~~ reactor trip Functions.

7

With one or two channels inoperable, one affected channel must be placed in a bypass or trip condition within ~~[6] hours~~6 hours. If one channel is bypassed, the logic becomes two-out-of-three, while still

ACTIONS (continued)

meeting the

single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) If one channel is tripped, the logic becomes one-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) If one channel is bypassed and one channel is tripped, the logic becomes one-out-of-two, while still meeting the single failure criterion. The ~~[6] hours~~6 hours allowed to place the inoperable channel(s) in the bypassed or tripped condition is justified in ~~Reference [7]~~Reference 7.

7

If Required Actions described above cannot be met within the specified Completion Times, the unit must be placed in a MODE where this Function is no longer required to be OPERABLE. A Completion Time of an additional 4 hours is allowed to reduce power < P-~~8~~10. Allowance of this time interval takes into consideration the redundant capability provided by the remaining two redundant OPERABLE channels and the low probability of occurrence of an event during this period that may require the protection afforded by this Function.

B5

M.1 and M.2

Condition M applies to the Safeguards Actuation signal from ESFAS reactor trip, the RTS Automatic Trip Logic, automatic ADS Stages 1, 2, and 3 actuation, and automatic CMT injection in MODES 1 and 2.

With one or two channels or divisions inoperable, the Required Action is to restore three of the four channels/divisions within 6 hours. Restoring all channels/divisions but one to OPERABLE status ensures that a single failure will neither cause nor prevent the protective function. The 6 hour Completion Time is considered reasonable since the protective function will still function.

If Required Actions described above cannot be met within the specified Completion Times, the unit must be placed in a MODE where this Function is no longer required to be OPERABLE. A Completion Time of an additional 6 hours is allowed to place the unit in MODE 3. The Completion Time is a reasonable time, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging plant systems. Allowance of this time interval takes into consideration the redundant capability provided by the remaining two redundant OPERABLE channels/divisions and the low probability of occurrence of an event during this period that may require the protection afforded by this Function.

ACTIONS (continued)

N.1, N.2.1, N.2.2, and N.3

Condition N applies to the P-6, P-10, and P-11 interlocks. With one or two channels inoperable, the associated interlock must be verified to be in its required state for the existing plant condition within 1 hour, or the Functions associated with inoperable interlocks placed in a bypassed or tripped condition within [7] hours, or the unit must be placed in MODE 3 within 13 hours. Verifying the interlock manually accomplishes the interlock condition. (7)

If one interlock channel is inoperable, the associated Function(s) must be placed in a bypass or trip condition within [7] hours. If one channel is bypassed, the logic becomes two-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) If one channel is tripped, the logic becomes one-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) (7)

If two interlock channels are inoperable, one channel of the associated Function(s) must be bypassed and one channel of the associated Function(s) must be tripped. In this state, the logic becomes one-out-of-two, while still meeting the single failure criterion. The [7] hours allowed to place the inoperable channel(s) in the bypassed or tripped condition is justified in ~~Reference [7]~~Reference 7. (7)

If placing the associated Functions in bypass or trip is impractical, for instance as the result of other channels in bypass or trip, the Completion Time of an additional 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging plant systems.

~~O.1, O.2.1, O.2.2, and O.3~~

~~Condition O applies to the P-8 interlock. With one or two channels inoperable, the associated interlock must be verified to be in its required state for the existing plant condition within 1 hour, or the Functions associated with inoperable interlocks placed in a bypassed or tripped condition within [7] hours, or the unit must be placed in MODE 2 within 13 hours. Verifying the interlock manually accomplishes the interlock condition.~~ B5 (7)

BASES

ACTIONS (continued)

B5 7

~~If one interlock channel is inoperable, the associated Function(s) must be placed in a bypass or trip condition within [7] hours. If one channel is bypassed, the logic becomes two-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) If one channel is tripped, the logic becomes one-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.)~~

B5 7

~~If two interlock channels are inoperable, one channel of the associated Function(s) must be bypassed and one channel of the associated Function(s) must be tripped. In this state, the logic becomes one-out-of-two, while still meeting the single failure criterion. The [7] hours allowed to place the inoperable channel(s) in the bypassed or tripped condition is justified in Reference [7].~~

B5

~~If placing the associated Functions in bypass or trip is impractical, for instance as the result of other channels in bypass or trip, the Completion Time of an additional 6 hours is reasonable, based on operating experience, to reach MODE 2 from full power in an orderly manner and without challenging plant systems.~~

B5

~~P~~O.1, ~~P~~O.2.1, and ~~P~~O.2.2

Condition ~~P~~ O applies to the RTBs, and RTB undervoltage and shunt trip mechanisms in MODES 1 and 2, and in MODES 3, 4, and 5 with the RTBs closed and the PLS capable of rod withdrawal. This Condition is primarily associated with mechanical damage that can prevent the RTBs from opening.

With one division inoperable, the reactor trip breakers in the inoperable division must be opened within 8 hours. A division is inoperable, if, within that division, one or both of the RTBs and/or one or both of the trip mechanisms is inoperable.

With one division inoperable (with its RTBs open) and with three OPERABLE divisions remaining, the trip logic becomes one-out-of-three. The one-out-of-three trip logic meets the single failure criterion. (A failure in one of the three remaining divisions will not prevent the protective function.) If, coincident with RTBs inoperable in one division, the automatic trip logic is inoperable in another division, the trip logic becomes one-out-of-two, which meets the single failure criterion.

SURVEILLANCE REQUIREMENTS (continued)

A Note modifies SR 3.3.1.4. The Note states that this Surveillance is required only if reactor power is > 50% RTP and that 24 hours is allowed for performing the first surveillance after reaching 50% RTP.

The Frequency of 92 EFPD is adequate. It is based on industry operating experience, considering instrument reliability and operating history data for instrument drift.

SR 3.3.1.5

SR 3.3.1.5 is the performance of a TADOT every 92 days on a STAGGERED TEST BASIS. This test shall verify OPERABILITY by actuation of the end devices.

The Reactor Trip Breaker (RTB) test shall include separate verification of the undervoltage and shunt trip mechanisms. Each RTB in a division shall be tested separately in order to minimize the possibility of an inadvertent trip.

The Frequency of every 92 days on a STAGGERED TEST BASIS is adequate. It is based on industry operating experience, considering instrument reliability and operating history data. In addition, the AP1000 design provides additional breakers to enhance reliability.

The SR is modified by a Note to clarify that both breakers in a single division are to be tested during each STAGGERED TEST.

SR 3.3.1.6

7

SR 3.3.1.6 is the performance of a REACTOR TRIP CHANNEL OPERATIONAL TEST (RTCOT) every ~~[92] days~~24 months.

A RTCOT is performed on each required channel to provide reasonable assurance that the entire channel will perform the intended Function.

A test subsystem is provided with the protection and safety monitoring system to aid the plant staff in performing the RTCOT. The test subsystem is designed to allow for complete functional testing by using a combination of system self checking features, functional testing features, and other testing features. Successful functional testing consists of verifying that the capability of the system to perform the safety function has not failed or degraded.

SURVEILLANCE REQUIREMENTS (continued)

For hardware functions this would involve verifying that the hardware components and connections have not failed or degraded. Generally this verification includes a comparison of the outputs from two or more redundant subsystems or channels.

Since software does not degrade, software functional testing involves verifying that the software code has not changed and that the software code is executing.

To the extent possible, protection and safety monitoring system functional testing is accomplished with continuous system self-checking features and the continuous functional testing features. The RTCOT shall include a review of the operation of the test subsystem to verify the completeness and adequacy of the results.

If the RTCOT can not be completed using the built-in test subsystem, either because of failures in the test subsystem or failures in redundant channel hardware used for functional testing, the RTCOT can be performed using portable test equipment.

(7)

This test frequency of ~~[92] days~~24 months is justified based on ~~Reference [7]~~Reference 7 and the use of continuous diagnostic test features, such as deadman timers, cross-check of redundant channels, memory checks, numeric coprocessor checks, and tests of timers, counters and crystal time bases, which will report a failure within the protection and safety monitoring system cabinets to the operator within 10 minutes of a detectable failure.

SR 3.3.1.6 is modified by a note that provides a 4 hour delay in the requirement to perform this Surveillance for source range instrumentation when entering MODE 3 from MODE 2. This note allows a normal shutdown to proceed without a delay for testing in MODE 2 and for a short time in MODE 3 until the RTBs are open and SR 3.3.1.6 is no longer required to be performed. If the unit is to be in MODE 3 with the RTBs closed for a time greater than 4 hours, this Surveillance must be performed prior to 4 hours after entry into MODE 3.

During the RTCOT, the protection and safety monitoring system cabinets in the division under test may be placed in bypass.

SR 3.3.1.7

SR 3.3.1.7 is the performance of a RTCOT as described in SR 3.3.1.6, except it is modified by a Note that this test shall include verification that the P-6 and P-10 interlocks are in their required state for the existing unit

BASES

SURVEILLANCE REQUIREMENTS (continued)

measure response times. Experience has shown that these components usually pass this surveillance when performed on a refueling frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

The SR 3.3.1.11 is modified by exempting neutron detectors from response time testing. A Note to the Surveillance indicates that neutron detectors may be excluded from RTS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response.

REFERENCES

1. Chapter 6.0, "Engineered Safety Features."

2. Chapter 7.0, "Instrumentation and Controls."

3. Chapter 15.0, "Accident Analysis."

4. WCAP-14606, "Westinghouse Setpoint Methodology for Protection Systems," April 1996 (nonproprietary).

5. Institute of Electrical and Electronic Engineers, IEEE-603-1991, "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations," June 27, 1991.

6. 10 CFR 50.49, "Environmental Qualifications of Electric Equipment Important to Safety for Nuclear Power Plants."

(7) [7. APP-GW-GSC-020, "Technical Specification Completion Time and Surveillance Frequency Justification."~~WCAP-10271-P-A (Proprietary) and WCAP-10272-A (Non-Proprietary), "Evaluation of Surveillance Frequencies and Out-of-Service Times for the Reactor Protection Instrumentation System," Supplement 2, Revision 1, June 1990.~~]

8. NRC Generic Letter No. 83-27, Surveillance Intervals in Standard Technical Specifications.

9. ESBU-TB-97-01, Westinghouse Technical Bulletin, "Digital Process Rack Operability Determination Criteria," May 1, 1997.

10. WCAP-13632-P-A (Proprietary) and WCAP-13787-A (Non-Proprietary), Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," January 1996.

ACTIONS (continued)

to refer to Table 3.3.2-1 and to take the Required Actions for the protection Functions affected. The Completion Times are those from the referenced Conditions and Required Actions.

B.1 and B.2

(7) With one or two channels or divisions inoperable, one affected channel or division must be placed in a bypass or trip condition within ~~[6] hours~~6 hours. If one channel or division is bypassed, the logic becomes two-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels or divisions will not prevent the protective function.) If one channel or division is tripped, the logic becomes one-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels or divisions will not prevent the protective function.) If one channel or division is bypassed and one channel or division is tripped, the logic becomes one-out-of-two, while still meeting the single failure criterion. The ~~[6] hours~~6 hours allowed to place the inoperable channel(s) or division(s) in the bypassed or tripped condition is justified in Reference ~~[6]~~.

C.1

(7) With one channel inoperable, the affected channel must be placed in a bypass condition within ~~[6] hours~~6 hours. The ~~[6] hours~~6 hours allowed to place the inoperable channel in the bypass condition is justified in Reference ~~[6]~~. If one CVS isolation channel is bypassed, the logic becomes one-out-of-one. A single failure in the remaining channel could cause a spurious CVS isolation. Spurious CVS isolation, while undesirable, would not cause an upset plant condition.

D.1

With one required division inoperable, the affected division must be restored to OPERABLE status within 6 hours.

Condition D applies to one inoperable required division of P-4 Interlock (Function 18.a). With one required division inoperable, the 2 remaining OPERABLE divisions are capable of providing the required interlock function, but without a single failure. The P-4 Interlock is enabled when RTBs in two divisions are detected as open. The status of the other inoperable, non-required P-4 division is not significant, since P-4 divisions can not be tripped or bypassed. In order to provide single failure tolerance, 3 required divisions must be OPERABLE.

ACTIONS (continued)

inoperable, the inoperable channel must be placed in a trip condition within 6 hours. If one channel is tripped, the logic becomes one-out-of-two, while still meeting the single failure criterion. The specified Completion Time is reasonable considering the time required to complete this action.

I.1 and I.2

(7) Condition I applies to IRWST containment recirculation valve actuation on safeguards actuation coincident with IRWST Level Low 3 (Function 23.b). With one or two channels inoperable, one affected channel must be placed in a bypass or trip condition within ~~[6] hours~~6 hours. If one channel is bypassed, the logic becomes two-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) If one channel is tripped, the logic becomes one-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) If one channel is bypassed and one channel is tripped, the logic becomes one-out-of-two, while still meeting the single failure criterion. The ~~[6] hours~~6 hours allowed to place the inoperable channel(s) in the bypassed or tripped condition is justified in Reference [6].

J.1 and J.2

(7) Condition J applies to the P-6, P-11, P-12, and P-19 interlocks. With one or two required channel(s) inoperable, the associated interlock must be verified to be in its required state for the existing plant condition within 1 hour, or any Function channels associated with inoperable interlocks placed in a bypassed condition within [7] hours. Verifying the interlock state manually accomplishes the interlock role.

(7) If one interlock channel is inoperable, the associated Function(s) must be placed in a bypass or trip condition within [7] hours. If one channel is bypassed, the logic becomes two-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.) If one channel is tripped, the logic becomes one-out-of-three, while still meeting the single failure criterion. (A failure in one of the three remaining channels will not prevent the protective function.)

If two interlock channels are inoperable, one channel of the associated Function(s) must be bypassed and one channel of the associated

BASES

ACTIONS (continued)

(7) Function(s) must be tripped. In this state, the logic becomes one-out-of-two, while still meeting the single failure criterion. The [7] hours allowed to place the inoperable channel(s) in the bypassed or tripped condition is justified in Reference [6].

K.1

LCO 3.08 is applicable while in MODE 5 or 6. Since irradiated fuel assembly movement can occur in MODE 5 or 6, the ACTIONS have been modified by a Note stating that LCO 3.0.8 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, the fuel movement is independent of shutdown reactor operations. Entering LCO 3.0.8 while in MODE 5 or 6 would require the optimization of plant safety, unnecessarily.

Condition K is applicable to the MCR Isolation and Air Supply Initiation (Function 20), during movement of irradiated fuel assemblies. If the Required Action and associated Completion Time of the first Condition listed in Table 3.3.2-1 is not met, the plant must suspend movement of the irradiated fuel assemblies immediately. The required action suspends activities with potential for releasing radioactivity that might enter the MCR. This action does not preclude the movement of fuel to a safe position.

L.1

If the required Action and associated Completion Time of the first Condition listed in Table 3.3.2-1 is not met, the plant must be placed in a MODE in which the LCO does not apply. This accomplished by placing the plant in MODE 3 within 6 hours. The allowed time is reasonable, based operating experience, to reach the required plant conditions from full power conditions in an orderly manner without challenging plant systems.

M.1 and M.2

If the Required Action and associated Completion Time of the first condition listed in Table 3.3.2-1 is not met, 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 6 hours and in MODE 4 within 12 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.

SURVEILLANCE REQUIREMENTS (continued)

The Frequency of every 92 days on a STAGGERED TEST BASIS provides a complete test of all four divisions once per year. This frequency is adequate based on the inherent high reliability of the solid state devices which comprise this equipment; the additional reliability provided by the redundant subsystems; and the use of continuous diagnostic test features, such as deadman timers, memory checks, numeric coprocessor checks, cross-check of redundant subsystems, and tests of timers, counters, and crystal time basis, which will report a failure within these cabinets to the operator.

SR 3.3.2.3

SR 3.3.2.3 is the performance of a TADOT of the manual actuations, initiations, and blocks for various ESF Functions, the Class 1E battery charger undervoltage inputs, and the reactor trip (P-4) input from the IPCs. 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 excludes verification of setpoints from the TADOT. The setpoints for the Class 1E battery charger undervoltage relays require bench calibration and are verified during CHANNEL CALIBRATION. The other functions have no setpoints associated with them.

SR 3.3.2.4

SR 3.3.2.4 is the performance of a CHANNEL CALIBRATION every 24 months or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor and the IPC.

The Frequency is based on operating experience and consistency with the refueling cycle.

This Surveillance Requirement is modified by a Note. The Note states that this test should include verification that the time constants are adjusted to the prescribed values where applicable.

SR 3.3.2.5

7

SR 3.3.2.5 is the performance of an CHANNEL OPERATIONAL TEST (COT) every ~~[92] days~~24 months.

BASES

SURVEILLANCE REQUIREMENTS (continued)

A COT is performed on each required channel to provide reasonable assurance that the entire channel will perform the intended ESF Function.

A test subsystem is provided with the protection and safety monitoring system to aid the plant staff in performing the COT. The test subsystem is designed to allow for complete functional testing by using a combination of system self-checking features, functional testing features, and other testing features. Successful functional testing consists of verifying that the capability of the system to perform the safety function has not failed or degraded.

For hardware functions this would involve verifying that the hardware components and connections have not failed or degraded. Generally this verification includes a comparison of the outputs from two or more redundant subsystems or channels.

Since software does not degrade, software functional testing involves verifying that the software code has not changed and that the software code is executing.

To the extent possible, protection and safety monitoring system functional testing is accomplished with continuous system self-checking features and the continuous functional testing features. The COT shall include a review of the operation of the test subsystem to verify the completeness and adequacy of the results.

If the COT can not be completed using the built-in test subsystem, either because of failures in the test subsystem or failures in redundant channel hardware used for functional testing, the COT can be performed using portable test equipment.

7

The ~~[92] day~~24 month Frequency is based on Reference 6 and the use of continuous diagnostic test features, such as deadman timers, cross-check of redundant channels, memory checks, numeric coprocessor checks, and tests of timers, counters and crystal time bases, which will report a failure within the integrated protection cabinets to the operator.

During the COT, the protection and safety monitoring system cabinets in the division under test may be placed in bypass.

SR 3.3.2.6

This SR ensures the individual channel ESF RESPONSE TIMES are less than or equal to the maximum values assumed in the accident analysis.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency of 24 months is based on the need to perform this surveillance during periods in which the plant is shutdown for refueling to prevent any upsets of plant operation. This Frequency is adequate based on the use of multiple circuit breakers to prevent the failure of any single circuit breaker from disabling the function and that all circuit breakers are tested.

REFERENCES

1. Chapter 6, "Engineered Safety Features."

2. Chapter 7, "Instrumentation and Controls."

3. Chapter 15, "Accident Analysis."

4. Institute of Electrical and Electronic Engineers, IEEE-603-1991, "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations," June 27, 1991.

5. 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants."

[6. APP-GW-GSC-020, "Technical Specification Completion Time and Surveillance Frequency Justification."~~WCAP-10271-P-A (Proprietary) and WCAP-10272-A (Non-Proprietary), Supplement 2, Rev. 1, "Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System," dated June 1990.~~]

7. 10 CFR 50, Appendix A, "General Design Criteria for Nuclear Power Plants."

8. NUREG-1218, "Regulatory Analysis for Resolution of USI A-47," 4/88.

9. WCAP-14606, "Westinghouse Setpoint Methodology for Protection Systems," April 1996 (nonproprietary).

10. ESBU-TB-97-01, Westinghouse Technical Bulletin, "Digital Process Rack Operability Determination Criteria," May 1, 1997.

11. WCAP-13632-P-A (Proprietary) and WCAP-13787-A (Non-Proprietary), Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," January 1996.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.6.1

SRs are specified in the Inservice Testing Program. Pressurizer safety valves are to be tested one at a time and in accordance with the requirements of ASME Code Section XI (Ref. 4), which provides the activities and Frequency necessary to satisfy the SRs. No additional requirements are specified.

The pressurizer safety valve setpoint is ± 3% for OPERABILITY; however, the values are reset to ± 1% during the Surveillance to allow for drift.

REFERENCES

1. ASME Boiler and Pressure Vessel Code, Section III, NB 7614.3.
2. [WCAP-16779~~7769~~, "~~Topical Report on~~AP1000 Overpressure Protection Report, ~~October 1971~~April 2007."] (1)
3. Chapter 15, "Accident Analyses."
4. ASME Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components."

BASES

APPLICABLE SAFETY ANALYSES (continued)

RCS Vent Performance

1 With the RCS depressurized, a vent size of ~~[9.3]~~4.15 square inches is capable of mitigating a limiting overpressure transient. The area of the vent is equivalent to the area of the inlet pipe to the RNS suction relief valve so the capacity of the vent is greater than the flow possible with either the mass or heat input transient, while maintaining the RCS pressure less than the minimum of either the maximum pressure on the P/T limit curve or 110 percent of the design pressure of the normal residual heat removal system.

The required vent area may be obtained by opening one ADS Stage 2, 3, or 4 flow path.

The RCS vent size will be reevaluated for compliance each time the P/T limit curves are revised based on the results of the vessel material surveillance.

The RCS vent is passive and is not subject to active failure.

The LTOP System satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO requires that the LTOP System is OPERABLE. The LTOP System is OPERABLE when the maximum coolant input and minimum pressure relief capabilities are OPERABLE. Violation of this LCO could lead to the loss of low temperature overpressure mitigation and violation of the Reference 1 limits as a result of an operational transient.

To limit the coolant input capability, the LCO requires all accumulator discharge isolation valves closed and immobilized, when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS temperature allowed in the PTLR.

The elements of the LCO that provide low temperature overpressure mitigation through pressure relief are:

a. One OPERABLE RNS suction relief valve; or

   An RNS suction relief valve is OPERABLE for LTOP when both RNS suction isolation valves in one flow path are open, its setpoint is within limits, and testing has proven its ability to open at this setpoint.

BASES

LCO (continued)

b. A depressurized RCS and an RCS vent.

1

An RCS vent is OPERABLE when open with an area of ≥ ~~[9.3]~~ 4.15 square inches.

Each of these methods of overpressure prevention is capable of mitigating the limiting LTOP transient.

APPLICABILITY

This LCO is applicable in MODE 4 when any cold leg temperature is below 275°F, MODE 5, and in MODE 6 when the reactor vessel head is on. The pressurizer safety valves provide overpressure protection that meets the Reference 1 P/T limits above 275°F. In MODE 6, the reactor vessel head is off, and overpressurization cannot occur.

LCO 3.4.3 provides the operational P/T limits for all MODES. LCO 3.4.6, "Pressurizer Safety Valves," requires the OPERABILITY of the pressurizer safety valves that provide overpressure protection during MODES 1, 2, and 3, and MODE 4 with the RNS isolated or RCS temperature ≥ 275°F.

Low temperature overpressure prevention is most critical during shutdown when the RCS is water solid, and a mass or heat input transient can cause a very rapid increase in RCS pressure with little or no time for operator action to mitigate the event.

The Applicability is modified by a Note stating that accumulator isolation is only required when the accumulator pressure is more than or at the maximum RCS pressure for the existing temperature, as allowed by the P/T limit curves.

This Note permits the accumulator discharge isolation valve Surveillance to be performed only under these pressure and temperature conditions.

ACTIONS

A.1, B.1, and B.2

An unisolated accumulator requires isolation within 1 hour. This is only required when the accumulator pressure is at or more than the maximum RCS pressure for the existing temperature allowed by the P/T limit curves.

If isolation is needed and cannot be accomplished in 1 hour, Required Action B.1 and Required Action B.2 provide two options, either of which must be performed in the next 12 hours. By increasing the RCS

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.14.2

The RNS suction relief valve shall be demonstrated OPERABLE by verifying two RNS suction isolation valves in one flow path are open. This Surveillance is only performed if the RNS suction relief valve is being used to satisfy this LCO.

The RNS suction isolation valves are verified to be opened every 12 hours. The Frequency is considered adequate in view of other administrative controls such as valve status indications available to the operator in the control room that verify the RNS suction isolation valves remain open.

SR 3.4.14.3

1

The RCS vent of ≥ ~~[9.3]~~4.15 square inches is proven OPERABLE by verifying its open condition either:

a. Once every 12 hours for a valve that is not locked (valves that are sealed or secured in the open position are considered "locked" in this context) or

b. Once every 31 days for other vent path(s) (e.g., a vent valve that is locked, sealed, or secured in position or a removed pressurizer safety valve or open manway also fits this category).

The passive vent arrangement must only be open to be OPERABLE. This Surveillance is required to be performed if the vent is being used to satisfy the pressure relief requirements of the LCO 3.4.14b.

SR 3.4.14.4

The RNS suction relief valve shall be demonstrated OPERABLE by verifying that two RNS suction isolation valves in one flow path are open and by testing it in accordance with the Inservice Testing Program. (Refer to SR 3.4.14.2 for the RNS suction isolation valve Surveillance.) This Surveillance is only required to be performed if the RNS suction relief valve is being used to meet this LCO. The ASME Code, Section XI (Ref. 5), test per Inservice Testing Program verifies OPERABILITY by proving proper relief valve mechanical motion and by measuring and, if required, adjusting the lift setpoint.

BASES

BACKGROUND (continued)

following an event. The need to close containment for the mid-loop period following a refueling must be evaluated since decay heat varies with the time after shutdown and the impact of the partial core replacement with new fuel. It is expected that containment will be closed for activities where drain-down is planned, such as the RCS drain-down from no-load pressurizer level for the initial mid-loop period during a refueling. Containment is not expected to be closed for minor, unplanned RCS volume transients, such as a short-term inventory where the pressurizer level may be reduced, but not emptied, and where recovery actions are within the time to containment closure.

The containment equipment hatches, which are part of the containment pressure boundary, provide a means for moving large equipment and components into and out of containment. If closed, the equipment hatch must be held in place by at least [four] bolts. Good engineering practice dictates that bolts required by this LCO be approximately equally spaced. Alternatively, if open, each equipment hatch can be installed using a dedicated set of hardware, tools and equipment. A self-contained power source is provided to drive each hoist while lowering the hatch into position. Large equipment and components may be moved through the hatches as long as they can be removed and the hatch closed prior to steaming into the containment.

1

~~Reviewers Note:~~ The design of the equipment hatch is such that the [four] bolts would only be needed to support the hatch in place and provide adequate strength to support the hatch dead weight and associated loads. The hatch is installed on the inside containment and is held in place against a matching flange surface with mating bolt pattern by the bolts. Once the dead weight is supported, any pressure (greater than atmospheric) within containment will serve to exert closure force on the hatch toward the mating flange surface serving to reduce stresses on bolts. Therefore the determination of the number of bolts is limited to the quantity required to support the hatch itself and not related to any potential containment pressure.

1

The containment air locks, which are also part of the containment pressure boundary, provide a means for personnel access during MODES 1, 2, 3, and 4 unit operation in accordance with LCO 3.6.2, "Containment Air Locks." Each air lock has a door at both ends. The doors are normally interlocked to prevent simultaneous opening when containment OPERABILITY is required. During periods of unit shutdown when containment closure is required, the door interlock mechanism may be disabled, allowing both doors of an air lock to remain open for

BASES

LCO

(1)

The requirement to maintain the pH adjustment baskets with ≥ {560} ft^3 of TSP assures that for DBA releases of iodine into containment, the pH of the containment sump will be adjusted to enhance the retention of the iodine.

A required volume is specified instead of mass because it is not feasible to weigh the TSP in the containment. The minimum required volume is based on the manufactured density of TSP. This is conservative because the density of TSP may increase after installation due to compaction.

APPLICABILITY

In MODES 1, 2, 3, and 4 a DBA could cause release of radioactive iodine to containment requiring pH adjustment. The pH adjustment baskets assist in reducing the airborne iodine fission product inventory available for release to the environment.

In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Thus, pH adjustment is not required to be OPERABLE in MODES 5 and 6.

ACTIONS

A.1

If the TSP volume in the baskets is not within limits, the iodine retention may be less than that assumed in the accident analysis for the limiting DBA. Due to the very low probability that the volume of TSP may change, the variations are expected to be minor such that the required capability is substantially available. The 72 hour Completion Time for restoration to within limits is consistent with times applied to minor degradations of ECCS parameters.

B.1 and B.2

If the Required Actions and associated Completion Times are not met, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 84 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

SURVEILLANCE REQUIREMENTS

SR 3.6.9.1

The minimum amount of TSP is [560] ft^3. A volume is specified since it is not feasible to weigh the TSP contained in the pH adjustment baskets. This volume is based on providing sufficient TSP to buffer the post accident containment water to a minimum pH of 7.0. Additionally, the TSP volume is based on treating the maximum volume of post accident water ([~~918,600~~]908,000 gallons) containing the maximum amount of boron ([~~3009~~]2990 ppm) as well as other sources of acid. The minimum required mass of TSP is [~~27,540~~]26,460 pounds. (1)

The minimum required volume of TSP is based on this minimum required mass of TSP, the minimum density of TSP plus margin to account for degradation of TSP during plant operation. The minimum TSP density is based on the manufactured density, since the density may increase and the volume decrease, during plant operation, due to agglomeration from humidity inside the containment. The minimum required TSP volume also has about 10% margin to account for degradation of TSP during plant operation.

The periodic verification is required every 24 months, since access to the TSP baskets is only feasible during outages, and normal fuel cycles are scheduled for 24 months. Operating experience has shown this Surveillance Frequency acceptable due to the margin in the volume of TSP placed in the containment building.

SR 3.6.9.2

Testing must be performed to ensure the solubility and buffering ability of the TSP after exposure to the containment environment. A representative sample of [~~2.36~~]2.39 grams of TSP from one of the baskets in containment is submerged in ≥ 1 liter of water at a boron concentration of [~~3009~~]2990 ppm and at the standard temperature of 25 ± 5°C. Without agitation, the solution pH should be raised to ≥ 7.0 within 4 hours. (1)

The minimum required amount of TSP is sufficient to buffer the maximum amount of boron [~~3009~~]2990 ppm, the maximum amount of other acids, and the maximum amount of water [~~918,600~~]908,000 gallons that can exist in the containment following an accident and achieve a minimum pH of 7.0. (1)

Agitation of the test solution is prohibited, since an adequate standard for the agitation intensity cannot be specified. The test time of 4 hours is necessary to allow time for the dissolved TSP to naturally diffuse through the sample solution. In the post LOCA sump area, rapid mixing would occur due to liquid flow, significantly decreasing the actual amount of time

B 3.9 REFUELING OPERATIONS

B 3.9.5 Containment Penetrations

BASES

BACKGROUND

During movement of irradiated fuel assemblies within containment, potential releases of fission product radioactivity within containment are monitored and filtered or are restricted from escaping to the environment when the LCO requirements are met. Monitoring of potential releases of radiation is performed in accordance with Administrative Controls Section 5.5.2, "Radioactive Effluent Control Program." In MODES 1, 2, 3, and 4, containment OPERABILITY is addressed in LCO 3.6.1, "Containment." In MODES 5 and 6, closure capability of containment penetrations is addressed in LCO 3.6.8, "Containment Penetrations." Since there is no potential for containment pressurization due to a fuel handling accident, the Appendix J leakage criteria and tests are not required in MODES 5 and 6.

The containment serves to contain fission product radioactivity that may be released from the reactor core following an accident, such that offsite radiation exposures are maintained within the requirements of 10 CFR 50.34. For a fuel handling accident, the AP1000 dose analysis does not rely on containment closure to meet the offsite radiation exposure limits. This LCO is provided as an additional level of defense against the possibility of a fission product release from a fuel handling accident.

The containment equipment hatches, which are part of the containment pressure boundary, provide a means for moving large equipment and components into and out of containment. During movement of irradiated fuel assemblies within containment, an equipment hatch is considered closed if the hatch cover is held in place by at least [four] bolts. Good engineering practice dictates that the bolts required by this LCO be approximately equally spaced.

1

If the equipment hatch is open, an alternative barrier between the containment atmosphere and the outside atmosphere shall be in place. Each containment equipment hatch opens into a staging area in the auxiliary building. These staging areas contain doors that open to the radiologically controlled areas of the annex building. The annex building contains a door that opens to the outside atmosphere. The alternate barrier may consist of the staging area in the auxiliary building, or may consist of the staging areas in the auxiliary building and the radiologically controlled areas in the annex building provided the doors from the annex building to the outside atmosphere are closed. The alternate barrier may

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.9.5.3

(1) This SR verifies the ability of the VFS to maintain a negative pressure (≤ ~~[~~-0.125~~]~~ inches water gauge relative to outside atmospheric pressure) in the containment and the portions of the auxiliary and/or annex building that comprise the envelope defined as the alternate barrier. This surveillance is performed with the VFS in containment operating. Doors in the alternate barrier which are normally closed may be opened for ingress and egress. The portion of the VAS which services the area enclosed by the alternate barrier is aligned to the VFS exhaust subsystem, and the VAS auxiliary/annex building supply fans and VFS containment purge supply fans not operating. The Frequency of 24 months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. 3).

SR 3.9.5.4

The VFS should be checked periodically to ensure that it functions properly. As the operating conditions on this system are not severe, testing each train within 31 days prior to fuel movement provides an adequate check on this system. Operation of the heater dries out any moisture accumulated in the charcoal from humidity in the ambient air.

REFERENCES

1. Section 15.7.4, "Fuel Handling Accident."

2. NUREG-0800, Section 15.0.1, Rev. 0.

3. NUREG-0800, Section 6.5.1, Rev. 2, July 1981.

B 3.9 REFUELING OPERATIONS

B 3.9.6 Containment Air Filtration System (VFS)

BASES

BACKGROUND

The radiologically controlled area ventilation system (VAS) serves the fuel handling area of the auxiliary building, and the radiologically controlled portions of the auxiliary and annex buildings, except for the health physics and hot machine shop areas which are provided with a separate ventilation system (VHS). If high airborne radioactivity is detected in the exhaust air from the fuel handling area, the auxiliary building, or the annex buildings, the VAS supply and exhaust duct isolation dampers automatically close to isolate the affected area from the outside environment and the containment air filtration exhaust subsystem starts. The VFS exhaust subsystem prevents exfiltration of unfiltered airborne radioactivity by maintaining the isolated zone at ≤ ~~[~~-0.125~~]~~ inches water gauge pressure relative to the outside atmosphere. Monitoring of potential releases of radiation is performed in accordance with Administrative Controls Section 5.5.2, "Radioactive Effluent Control Program." (1)

For a fuel handling accident, the AP1000 dose analysis does not rely on the OPERABILITY of the VAS or VFS exhaust subsystem to meet the offsite radiation exposure limits. This LCO is provided as an additional level of defense-in-depth against the possibility of a fission product release from a fuel handling accident in the fuel building. The plant vent radiation detectors monitor effluents discharged from the plant vent to the environment.

Each VFS exhaust subsystem includes one 100 percent capacity exhaust air filtration unit, and the associated exhaust fan, heater and ductwork.

The filtration units are connected to a ducted system with isolation dampers to provide HEPA filtration and charcoal adsorption of exhaust air from the containment, fuel handling area, radiologically controlled areas of the auxiliary and annex buildings. A gaseous radiation monitor is located downstream of the exhaust air filtration units to provide an alarm if abnormal gaseous releases are detected. The plant vent exhaust flow is monitored for gaseous, particulate and iodine releases to the environment. During conditions of abnormal airborne radioactivity in the fuel handling area, auxiliary and/or annex buildings, the VFS exhaust subsystem provides filtered exhaust to minimize unfiltered offsite releases.

BASES

ACTIONS (continued)

LCO 3.0.8 is applicable while in MODE 5 or 6. Since irradiated fuel assembly movement can occur in MODE 5 or 6, the ACTIONS have been modified by a Note stating that LCO 3.0.8 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, the fuel movement is independent of shutdown reactor operations. Entering LCO 3.0.8 while in MODE 5 or 6 would require the optimization of plant safety, unnecessarily.

A.1

When the required VFS exhaust subsystem is inoperable during movement of irradiated fuel assemblies in the fuel building, action must be taken to place the unit in a condition in which the LCO does not apply. Action must be taken immediately to suspend movement of irradiated fuel assemblies in the fuel building. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

Each VFS exhaust subsystem should be checked 31 days prior to fuel movement in the fuel handling area to ensure that it functions properly. As the operating conditions on this subsystem are not severe, testing each subsystem within one month prior to fuel movement provides an adequate check on this system. Operation of the heater dries out any moisture accumulated in the charcoal from humidity in the ambient air.

SR 3.9.6.2

This SR verifies that the VAS fuel handling area subsystem aligns to the VFS and that the VFS exhaust subsystem starts and operates on an actual or simulated actuation signal. During the post-accident mode of operation, the VAS fuel handling area subsystem aligns to the VFS filtered exhaust subsystem. The 24 month Frequency is consistent with Reference 4.

SR 3.9.6.3

(1) This SR verifies the integrity of the fuel handling area of the auxiliary building enclosure. The ability of the VAS and VFS to maintain negative pressure (≤ [-0.125] inches water gauge relative to outside atmospheric pressure) in the fuel handling area of the auxiliary building is periodically tested to verify proper function of the VAS and VFS exhaust subsystem. During this surveillance, the VAS fuel handling area subsystem is aligned

BASES

SURVEILLANCE REQUIREMENTS (continued)

(1) to the operating VFS exhaust subsystem. The fan for the VAS fuel handling area subsystem is off. In this configuration, the VFS exhaust subsystem is designed to maintain a negative pressure in the fuel handling area of the auxiliary building (≤ [-0.125] inches water gauge relative to outside atmospheric pressure), to prevent unfiltered and unmonitored leakage. Doors may be opened for short periods of time to allow ingress and egress. During this surveillance, the VAS may be servicing the remaining portions of the auxiliary and annex buildings. The Frequency of 24 months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. 5).

REFERENCES

1. Section 9.4.3, "Radiologically Controlled Area Ventilation System."
2. Section 9.4.7, "Containment Air Filtration System."
3. Section 15.7.4, "Fuel Handling Accident."
4. Regulatory Guide 1.140 (Rev. 2).
5. NUREG-0800, Section 6.5.1, Rev. 2, July 1981.