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Attn: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

St. Lucie Nuclear Plant, Units 1 and 2
Docket Nos. 50-335 and 50-389

Subject: Fourth Response to Request for Additional Information Regarding License Amendment Request to Adopt Risk Informed Completion Times TSTF-505, Revision 1, "Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b"

References:

1. Florida Power & Light Company letter L-2014-242, "Application to Adopt TSTF-505, Revision 1, Provide Risk-Informed Extended Completion Times - RITSTF Initiative 4B," December 5, 2014 (ML14353A016)
2. NRC E-mail "Request for Additional Information - St. Lucie TSTF-505 EICB - MF5372 & MF 5373," March 28, 2016 (ML16089A006)
3. NRC E-mail "Request for Additional Information - St. Lucie TSTF-505 APLA - MF5372 & MF5373," April 13, 2016 (ML16105A456)
4. NRC E-mail "Request for Additional Information - St. Lucie TSTF 505 APLA - MF5372 & MF5373," May 27, 2016 (ML16152A187)
5. Florida Power & Light Company letter L-2016-114, "Response to Request for Additional Information Regarding License Amendment Request to Adopt TSTF-505, 'Provide Risk-Informed Extended Completion Times - RITSTF Initiative 4B'," July 8, 2016 (ML16193A659)
6. Florida Power & Light Company letter L-2016-135, "Second Response to Request for Additional Information Regarding License Amendment Request to Adopt TSTF-505, 'Provide Risk-Informed Extended Completion Times - RITSTF Initiative 4B'," July 22, 2016 (ML16208A061)
7. Florida Power & Light Company letter L-2017-007 "Supplement to License Amendment Request to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times - RITSTF Initiative 4b'," February 25, 2017 (ML17058A181)
8. NRC E-mail "Request for Additional Information - St. Lucie RICT LAR - MF5372/5363," October 4, 2017 (ML17277A369)
9. NRC E-mail "Request for Additional Information – St. Lucie RICT LAR I&C – (CACs MF5372/MF5375 EPID L-2014-LLA-0001)," February 1, 2018 (ML18033A014)

10. Florida Power & Light Company letter 2017-006, "Third Response to Request for Additional Information Regarding License Amendment Request to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b'," February 1, 2018 (ML18032A614)

In Reference 1, as supplemented by References 5, 6, 7 and 10, Florida Power & Light Company (FPL) submitted a license amendment request (LAR) for St. Lucie Units 1 and 2. The proposed amendment would revise the Technical Specifications (TS) to implement TSTF-505, Revision 1, "Provide Risk-Informed Extended Completion Times RITSTF [Risk Informed TSTF] Initiative 4b."

In References 8 and 9, the NRC staff requested additional information to support its review of the LAR. The Enclosure to this letter provides FPL's response to the request for additional information (RAI). Reference 10 responded to all but the electrical questions (EEOB) in Reference 8, so this letter responds to the electrical questions in Reference 8 and the I&C (EICB) questions in Reference 9. In addition, the enclosure discusses FPL's withdrawal of a proposed change related to the TS for the main steam isolation valves.

Attachments 1 and 2 to the Enclosure contain markups of the TS for Units 1 and 2, respectively, which revise the proposed changes to TS 3.8.1.1, "A.C. Sources – Operating," and TS 3.7.1.5, "Main Steam Isolation Valves." The TS markups supersede the corresponding markups provided in Reference 7.

This RAI response does not alter the conclusions in Reference 1 that the changes do not involve a significant hazards consideration pursuant to 10 CFR 50.92, and there are no significant environmental impacts associated with the changes.

No new or revised commitments are included in this letter

Should you have any questions regarding this submittal, please contact Mr. Mike Snyder, Licensing Manager, at (772) 467-7036.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on March 15, 2018

Sincerely,

Dan DeBoer
Site Director
Florida Power & Light Company

Enclosure

cc: NRC Regional Administrator, Region II
NRC Senior Resident Inspector
NRC Project Manager
Ms. Cindy Becker, Florida Department of Health

ENCLOSURE

Response to Request for Additional Information (RAI)

A. Electrical (EEOB) RAI

1. RAI-MF5372/MF5373-EEOB-01

The Commission's Policy on Probabilistic Risk Assessment, "Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities," dated August 16, 1995, identifies five key safety principles required for risk-informed decision-making applied to changes to TSs as delineated in RG 1.177 and RG 1.174. They are:

- The proposed change meets current regulations;
- The proposed change is consistent with defense-in-depth philosophy;
- The proposed change maintains sufficient safety margins;
- Increases in risk resulting from the proposed change are small and consistent with the Commission's Safety Goal Policy Statement; and
- The impact of the proposed change is monitored with performance measurement strategies.

NEI 06-09, "Risk Informed Technical Specifications Initiative 4b: Risk Managed Technical Specifications (RMTS)," Revision 0-A, states that Risk Management Actions (RMAs) and compensatory actions for significant components should be predefined to the extent practicable in plant procedures and implemented at the earliest appropriate time in order to maintain defense-in-depth.

Moreover, the NRC staff's safety evaluation for NEI 06-09, Section 4.0, "Limitations and Conditions," (ADAMS No. ML12286A322) states that a licensee's LAR adopting the NEI 06-09 initiative will describe the process to identify and provide compensatory measures and RMAs during extended Completion Times (CT), and provide examples of compensatory measures/RMAs.

In Enclosure 12 to the December 5, 2014, LAR, the licensee provided two examples of risk management actions that are considered during a RICT for: a) inoperable diesel generator, and b) inoperable battery.

Provide similar examples of RMAs to assure a reasonable balance of defense-in-depth is maintained for the following TS Actions:

TS LCO/Action	Description	Current Completion Time
Unit 1		
3.8.1.1 a	One of two offsite circuits inoperable	72 h
3.8.1.1 c	One of two offsite A.C. circuits and one of two diesel generator sets inoperable	12 h
3.8.1.1 d	Two of the required offsite A.C. circuits inoperable	24 h
3.8.1.1 f	One of the Unit 1 startup transformers (1A or 1B) inoperable and a Unit 2 startup transformer (2A or 2B)	72 h
3.8.2.1 Action (undesignated)	Less than required A.C. busses OPERABLE (One or more AC electrical busses inoperable)	8
Unit 2		
3.8.1.1 a	One of two offsite circuits inoperable	72 h
3.8.1.1 c	One of two offsite A.C. circuits and one of two diesel generator sets inoperable	12 h
3.8.1.1 d	Two of the required offsite A.C. circuits inoperable	24 h
3.8.1.1 f	One of the Unit 2 startup transformers (2A or 2B) inoperable and a Unit 1 startup transformer (1A or 1B)	72 h
3.8.3.1 a	One of the required trains of A .C. Emergency busses not fully energized	8 h
3.8.3.1 b (1)	One A. C. Instrument Bus either not energized from its associated inverter, or with the inverter not connected to its associated D.C. Bus ((1) re-energize the A.C. Instrument Bus)	2 h
3.8.3.1 b (2)	One A. C. Instrument Bus either not energized from its associated inverter, or with the inverter not connected to its associated D.C. Bus ((2) re-energize the A. C. Instrument Bus from its associated inverter connected to its associated D.C. Bus)	24 h
3.8.3.1 c	One D.C. bus not energized from its associated battery bank	2 h

FPL Response

Examples of standard RMAs consist of the following:

- Discuss planned maintenance activity and the associated plant configuration risk impact with operations and maintenance shift crews and obtain operator awareness and approval of planned evolutions.
- Conduct pre-job briefing of maintenance personnel, emphasizing risk aspects of planned plant evolutions.

The table below provides example RMAs. FPL is withdrawing the proposed changes to add a risk informed completion time (RICT) to the TS Actions listed below; therefore, these TS are excluded from the table.

Unit 1	TS 3.8.2.1, A.C. Distribution – Operating	Action
	TS 3.8.2.3, D.C. Distribution – Operating	Action a
Unit 2	TS 3.8.2.1, D.C. Sources	Action a
	TS 3.8.3.1, Onsite Power Distribution - Operating	Actions a, b, and c

TS LCO/ Action	Description	Current Completion Time	RMA
UNIT 1			
3.8.1.1 a	One of two offsite circuits inoperable	72 h	Perform 1-OSP-100.01(- 100.13), 4.2.2.3 and 4.2.2.4. Ensure AB bus aligned to other Offsite circuit. Perform fleet procedure OP-AA-102- 1003 for guarding equipment as applicable.
3.8.1.1 c	One of two offsite A.C. circuits and one of two diesel generator sets inoperable	12 h	Perform1-OSP-100.01(- 100.13), 4.2.2.3 and 4.2.2.4. Ensure AB bus aligned to Other Offsite circuit. Perform fleet procedure OP-AA-102- 1003 for guarding equipment as applicable.
3.8.1.1 d	Two of the required offsite A.C. circuits inoperable	24 h	Ensure both diesels are operable. Guard both EDGs
3.8.1.1 f	One of the Unit 1 startup transformers (1A or 1B) inoperable and a Unit 2 startup transformer (2A or 2B)	72 h	Complete 0-NOP-53.02, Removal and Restoration of Startup Transformers Mode 1. No load threatening actives shall be allowed to occur while a start-up transformer is out-of- service. Guard equipment per OP-AA-102-1003, Guarded Equipment, for 1A [B] S/U Transformer and 2A [B] S/U Transformer being Degraded/OOS.

TS LCO/ Action	Description	Current Completion Time	RMA
UNIT 2			
3.8.1.1 a	One of two offsite circuits inoperable	72 h	Perform 2-OSP-100.01(- 100.13), 4.2.2.1 and 4.2.2.2. Ensure AB bus aligned to other Offsite circuit. Perform fleet procedure OP-AA-102-1003 for guarding equipment as applicable.
3.8.1.1 c	One of two offsite A.C. circuits and one of two diesel generator sets inoperable	12 h	Perform 2-OSP-100.01(- 100.13), 4.2.2.1 and 4.2.2.2. Ensure AB bus aligned to other Offsite circuit. Perform 2-OSP-59.01A/B, (Section 8.2) Guard other EDG. Perform fleet procedure OP-AA-102-1003 for guarding equipment as applicable.
3.8.1.1 d	Two of the required offsite A.C. circuits inoperable	24 h	Ensure both diesels are operable. Guard both EDGs.
3.8.1.1 f	One of the Unit 2 startup transformers (2A or 2B) inoperable and a Unit 1 startup transformer (1A or 1B) connected to the same A or B offsite power circuit and administratively available to both units	72 h	Perform 2-OSP-100.01(- 100.13), 4.2.2.1 and 4.2.2.2. Protect all other components in the offsite circuits. Ensure AB bus aligned to other Offsite circuit. Perform 2-OSP-59.01A/B, (Section 8.2) Guard other SUT and both EDGs per OP-AA-102-1003, Guarded Equipment.

2. RAI-MF5372/MF5373-EEOB-02

In the LAR, Enclosure 1, Table E1-1, "In Scope TS/LCO Conditions to Corresponding PRA Functions," describes the design success criteria for each TS Limiting Condition for Operation (LCO).

Provide a revised Table E1-1 for the Electrical Power Systems TSs that includes details for each Action statement (see table in RAI-MF5372/MF5373-EEOB-01 depicting details by TS action rather than by LCO) to be utilized in the RICT Program. Provide the design success criteria for

each Action and clarify the absolute minimum set of equipment needed to accomplish the safety function.

FPL Response

A revised Table E1-1 is provided below. FPL is withdrawing the proposed changes to add a RICT to the Actions in Unit 1 TS 3.8.2.1 and 3.8.2.3, and Unit 2 TS 3.8.2.1 and 3.8.3.1; therefore, these TS are excluded from revised Table E1-1.

Table E1-1: In Scope TS/LCO Conditions to Corresponding PRA Functions		
TS LCO/Condition	**Design Success Criteria**	**Absolute minimum set of equipment needed to accomplish the safety function**
Unit 1		
3.8.1.1 a One of two offsite circuits inoperable	• Automatically power associated safety-related busses. • Sufficient power for the complement of safety related equipment needed to achieve safe plant shutdown and/or to mitigate the consequences of a design basis accident. • A single startup transformer is adequately sized to accommodate the outage auxiliary loads of both units.	• 1A startup transformer, 1A2, and 1A3 SWGR, or • 1B Startup Transformer, 1B2, and 1B3 SWGR, or • 1A or 1B Diesel Generator and its associated 1A3 or 1B3 SWGR
3.8.1.1 c One of two offsite A.C. circuits and one of two diesel generator sets inoperable	• Automatically power associated safety-related busses. • Sufficient power for the complement of safety related equipment needed to achieve safe plant shutdown and/or to mitigate the consequences of a design basis accident. • A single startup transformer is adequately sized to accommodate the outage auxiliary loads of both units	• 1A startup transformer, 1A2, and 1A3 SWGR, or • 1B Startup Transformer, 1B2, and 1B3 SWGR, or • 1A or 1B Diesel Generator and its associated 1A3 or 1B3 SWGR
3.8.1.1 d Two of the required offsite A.C. circuits inoperable	• Automatically power associated safety-related busses • Sufficient power for the complement of safety related equipment needed to achieve safe plant shutdown and/or to mitigate the consequences of a design basis accident.	1A or 1B Diesel Generator and its associated 1A3 or 1B3 SWGR
3.8.1.1 f One of the Unit 1 startup transformers (1A or 1B) inoperable and a Unit 2 startup transformer (2A or 2B) connected to the same A or B offsite power circuit	• Automatically power associated safety-related busses • Sufficient power for the complement of safety related equipment needed to achieve safe plant shutdown and/or to mitigate the consequences of a design basis accident. • A single startup transformer is adequately sized to accommodate the outage auxiliary loads of both units	• 1A startup transformer, 1A2, and 1A3 SWGR, or • 1B Startup Transformer, 1B2, and 1B3 SWGR, or • 1A or 1B Diesel Generator and its associated 1A3 or 1B3 SWGR

Unit 2		
3.8.1.1 a One of two offsite circuits inoperable	• Automatically power associated safety-related busses • Sufficient power for the complement of safety related equipment needed to achieve safe plant shutdown and/or to mitigate the consequences of a design basis accident. • A single startup transformer is adequately sized to accommodate the outage auxiliary loads of both units	• 2A Startup Transformer, 2A2, and 2A3 SWGR, or • 2B Startup Transformer, 2B2, and 2B3 SWGR, or • 2A or 2B Diesel Generator and its associated 2A3 or 2B3 SWGR
3.8.1.1 c One of two offsite A.C. circuits and one of two diesel generator sets inoperable	• Automatically power associated safety-related busses • Sufficient power for the complement of safety related equipment needed to achieve safe plant shutdown and/or to mitigate the consequences of a design basis accident.	• 2A Startup Transformer, 2A2, and 2A3 SWGR, or • 2B Startup Transformer, 2B2, and 2B3 SWGR, or • 2A or 2B Diesel Generator and its associated 2A3 or 2B3 SWGR
3.8.1.1 d Two of the required offsite A.C. circuits inoperable	• Automatically power associated safety-related busses • Sufficient power for the complement of safety related equipment needed to achieve safe plant shutdown and/or to mitigate the consequences of a design basis accident.	2A or 2B Diesel Generator and its associated 2A3 or 2B3 SWGR
3.8.1.1 f One of the Unit 2 startup transformers (2A or 2B) inoperable and a Unit 1 startup transformer (1A or 1B) connected to the same A or B offsite power circuit	• Automatically power associated safety-related busses • Sufficient power for the complement of safety related equipment needed to achieve safe plant shutdown and/or to mitigate the consequences of a design basis accident. • A single startup transformer is adequately sized to accommodate the outage auxiliary loads of both units	• 2A Startup Transformer, 2A2, and 2A3 SWGR, or • 2B Startup Transformer, 2B2, and 2B3 SWGR, or • 2A or 2B Diesel Generator and its associated 2A3 or 2B3 SWGR

3. RAI-MF5372/MF5373-EEOB-03

In the February 25, 2017, LAR supplement, the licensee proposed (for each Unit) to move a NOTE in LCO 3.8.1.1, "A.C. Sources," applicable to Actions b and c. The NOTE states, "If the absence of any common-cause failure cannot be confirmed, this test shall be completed regardless of when the inoperable EDG is restored to OPERABILITY," and is indicated by an asterisk that it applies to the statement, "demonstrate the OPERABILITY of the remaining OPERABLE EDG by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours unless it can be confirmed that the cause of the inoperable EDG does not exist on the remaining EDG."

When the NOTE for Action b and Action c are re-positioned above each Action and the asterisks are deleted, the applicability of "this test" is no longer clear, as there are two Surveillance Requirements in both Action statements. Provide a revised TS Markup for 3.8.1.1 for St. Lucie Units 1 and 2 to clarify these discrepancies

FPL Response

The notes applicable to Actions b and c in TS 3.8.1.1, "A.C. Sources," are revised to specify the applicable surveillance requirement as shown below.

> If the absence of any common-cause failure cannot be confirmed, ~~this test~~ ***Surveillance Requirement 4.8.1.1.2.a.4*** shall be completed regardless of when the inoperable EDG is restored to OPERABILITY

4. RAI-MF5372/MF5373-EEOB-04

In Enclosure 1 of the LAR, Tables E1-2, "Unit 1 In Scope TS/LCO Conditions RICT Estimate," and E1-3, "Unit 2 In Scope TS/LCO Conditions RICT Estimate," detail the licensee's estimated RICT calculations for Units 1 and 2, respectively. The licensee provided estimates of less than (<) 1 day for the following Electrical Power System TS Actions:

TS LCO/Action	Description	Current Completion Time
Unit 1		
3.8.2.1 Action (undesignated)	Less than required A.C. busses OPERABLE (One or more AC electrical busses inoperable)	8 h
3.8.2.3 a	One of the required battery banks or busses Inoperable	2 h
Unit 2		
3.8.2.1 a	One battery bank inoperable	2 h
3.8.3.1 a	One of the required trains of A .C. Emergency busses not fully energized	8 h
3.8.3.1 c	One D.C. bus not energized from its associated battery bank	2 h

For the above Actions, provide the estimated RICT values in hours.

FPL Response

FPL is withdrawing the proposed changes to add a RICT to the Actions in Unit 1 TS 3.8.2.1 and 3.8.2.3, and Unit 2 TS 3.8.2.1 and 3.8.3.1.

5. RAI-MF5372/MF5373-EEOB-05

St. Lucie's Updated Final Safety Analysis Report, Chapter 8, states:

> The onsite ac and dc power systems are designed with redundancy and independence of onsite power sources, buses, switchgear, distribution cabling and controls to provide reliable supply of electrical power to safety related electrical loads needed to achieve safe plant shutdown or to mitigate the consequences of a design basis accident.

When the licensee enters the TS 3.8.2.1 Action (undesignated), these buses carry the potential vulnerability to single failures that will reduce protection against the exceedance of the design limits.

TS LCO/Action	Description	Current Completion Time
Unit 1		
3.8.2.1 Action (undesignated)	Less than the complement of A.C. busses OPERABLE (One or more AC electrical busses inoperable)	8 h

1) For the above TS condition's lowest estimated RICT (least amount of time available, calculated beyond the front-stop):

    a. Describe a scenario/plant configuration for this condition.

    b. Explain how each bus would retain the ability to defend against vulnerabilities during this scenario (e.g., examples of RMAs to assure a reasonable balance of defense-in-depth is maintained for this TS condition).

2) For the above TS condition's highest estimated RICT (most risk significant component(s) that would result in a calculation close to the 30-day back-stop, without Probabilistic Risk Assessment (PRA) functional consideration):

    a. Describe a scenario/plant configuration for this condition.

    b. Explain how each bus would retain the ability to defend against vulnerabilities during this scenario (e.g., examples of RMAs to assure a reasonable balance of defense-in-depth is maintained for this TS condition).

FPL Response

FPL is withdrawing the proposed changes to add a RICT to the Action in Unit 1 TS 3.8.2.1, A.C. Distribution – Operating.

B. Additional Change to LAR Related to Main Steam Isolation Valves

The LAR includes a proposed change to apply a RICT to the Action in TS 3.7.1.5, Main Steam Isolation Valves, for an inoperable main steam isolation valve (MSIV) in Mode 1. FPL determined that the condition in which one MSIV is inoperable does not result in a loss of function with regard to a steam line break. However, the analysis of a steam generator tube rupture relies on closure of the MSIV to isolate the affected steam generator, and an inoperable MSIV could result in the inability to accomplish this safety function. Therefore, FPL is withdrawing the proposed change to apply a RICT to the Action for an inoperable MSIV in Mode 1.

C. I&C (EICB) RAI

1. RAI-MF5372/73-EICB-08

The LAR is a risk-informed request to modify St Lucie, Units 1 and 2 Technical Specification. Regulatory guidance on risk-informed changes to a licensing basis is provided in Regulatory Guide (RG) 1.174, Revision 2, "An Approach for Using Probabilistic Risk Assessment in Risk Informed Decisions on Plant Specific Changes to the Licensing Basis," May 2011 (ADAMS Accession No. ML100910006), and regulatory guidance on risk-informed changes to technical specifications is provided in Revision 1 of RG 1.177, "An Approach for Plant Specific, Risk Informed Decisionmaking: Technical Specifications," May 2011 (ADAMS Accession No. ML100910008). Both RGs describes an acceptable risk-informed approach for assessing the nature and impact of proposed permanent licensing basis changes by considering engineering issues and applying risk insights. Additionally, both RGs describe the regulatory positions and requirements with respect to the traditional engineering considerations of the defense-in-depth attributes.

The NRC staff is requesting additional information to determine the consistency with defense-in-depth of the proposed changes to TS Section 3/4.3, "Instrumentation," to ensure redundancy and diversity are maintained.

Please verify that there is at least one diverse means to mitigate each condition/accident for which each identified I&C function defined in TS 3/4.3 is designed to prevent. For example, provide a summary table of the diverse means that exist to initiate the safety function for each plant accident condition that each TS 3/4.3 function is currently designed to address.

FPL Response

The tables on the following pages show that for each reactor protection system (RPS) function and each engineered safety features system (ESFS) instrument function in TS Section 3/4.3, "Instrumentation," there is a least one diverse means for initiating the safety function. Tables 1 and 3 for Units 1 and 2, respectively, show the diverse means for initiating the safety function (i.e., reactor trip) for RPS instrumentation. Similarly, Tables 2 and 4 for Units 1 and 2, respectively, show that there is a least one diverse means for initiating the safety function (e.g., safety injection, containment isolation, containment spray, etc.) for each ESFS instrument.

The following abbreviations are used in Tables 1 - 4:

ADV	Atmospheric Dump Valves	MSLB	Main Steam Line Break
AFW	Auxiliary Feedwater	MSSV	Main Steam Safety Valve
CEA	Control Element Assembly	PORV	Power Operated Relief Valve
CIAS	Containment Isolation Actuation Signal	PZR	Pressurizer
CSAS	Containment Spray Actuation Signal	RAS	Recirculation Actuation Signal
CVCS	Chemical & Volume Control System	RCP	Reactor Coolant Pump
ECCS	Emergency Core Cooling System	RCS	Reactor Coolant System
EDG	Emergency Diesel Generator	SBLOCA	Small Break Loss of Coolant Accident
LBLOCA	Large Break Loss of Coolant Accident	SBO	Station Blackout
LOCA	Loss of Coolant Accident	SG	Steam Generator
LOOP	Loss of Offsite Power	SGTR	Steam Generator Tube Rupture
MFIS	Main Feedwater Isolation Signal	SIAS	Safety Injection Actuation Signal
MFIV	Main Feedwater Isolation Valve	SUR	Startup Rate
MSIS	Main Steam Isolation Signal	TM/LP	Thermal Margin/Low Pressure
MSIV	Main Steam Isolation Valve	UV	Undervoltage

Table 1 - Unit 1 RPS Instrumentation Diversity

FUNCTION	Safety Function	Plant Condition / Accident	Diverse Reactor Trips	ESF Actuations	Other Safety Equipment
1. Manual Reactor Trip	Reactor Trip	a. Automatic actuation failed b. Operator training	1) Two sets of Reactor Trip pushbuttons 2) MG set output breakers 3) MG set Load Contactors 4) Reactor Trip Breakers		
2. Power Level - High	Reactor Trip	a. Uncontrolled Control Element Assembly (CEA) Withdrawal - Zero power UFSAR §15.2.1.1	1) Automatic Protection •Startup Rate - High(1) •Power Level - High •Pressurizer Pressure - High •Thermal Margin/Low Pressure •SG Water Level - Low 2) Manual Trip	• AFW Initiation	•PZR Spray •PORV Opening •PZR Safety Valve Lifting •Rod Withdrawal Prohibit
		b. CEA Drop Accident UFSAR §15.2.3.2	1) Automatic Protection • Power Level - High trip • Thermal Margin/Low Pressure trip 2) Manual Trip		•CEA position deviation alarms
		c. CVCS Malfunction -Boron Dilution UFSAR §15.2.4.2.1	1) Automatic Protection • Power Level - High • Thermal Margin/Low Pressure Trip 2) Manual Trip		•BORON DILUTION alarm
		d. Excess Steam Load-Open All Steam Dump Bypass UFSAR §15.2.11.2.4	1) Automatic Protection • Power Level - High • Thermal Margin/Low Pressure Trip •SG Water Level - Low(4) •SG Pressure - Low(4) 2) Manual Trip	• AFW Initiation • SIAS • CIAS • MSIS	
		e. CEA Rod Ejection (with no RCS leakage)(3) UFSAR §15.4.5	1) Automatic Protection • Power Level - High trip • Containment Pressure High(4) 2) Manual Trip	• SIAS(4) • CIAS	• CEA position deviation alarms • SG Atmospheric Dump Valves (ADVs) • Containment RMs(4)
		f. Main Steam Line Break (MSLB) outside containment UFSAR §15.4.6	1) Automatic Protection • Power Level - High trip • Asymmetric SG Pressure - High trip • SG Pressure Low Trip(4) • Turbine trip(4) • SG Water Level low trip(4) 2) Manual Trip	• AFW Initiation • MSIS • SIAS • CIAS • CSAS • AFW Isolation(3)	•SG ADVs • CR Ventilation on Recirc

Table 1 - Unit 1 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips**	**ESF Actuations**	**Other Safety Equipment**
		g. MSLB inside containment UFSAR §15.4.6	1) Automatic Protection • Power Level - High trip • Asymmetric SG Pressure - High trip • SG Pressure Low Trip(4) • Turbine trip(4) • SG Water Level low trip(4) • Containment Pressure High trip 2) Manual Trip	• AFW Initiation • MSIS • SIAS • CIAS • CSAS • AFW Isolation(3)	•SG ADVs
		h. Uncontrolled CEA Withdrawal - Full power UFSAR §15.2.1.2.2	1) Automatic Protection • Power Level - High • Thermal Margin/Low Pressure • Local Power Density - High • Pressurizer Pressure - High 2) Manual Trip		•PORV Opening
3. Reactor Coolant Flow - Low	Reactor Trip	a. Loss of Reactor Coolant Pump (RCP) UFSAR §15.2.5.2.1	1) Automatic Protection • Reactor Coolant Flow-Low 2) Manual Trip		• PZR Spray Valves open
		b. Loss of Offsite Power (LOOP) UFSAR §15.2.9.1	1) Automatic Protection • Turbine Trip • Reactor Coolant Flow - Low trip • SG Water Level low trip 2) Manual Trip	• AFW Initiation • EDG Start(3)	• MSSV Lift • SBO cross-tie to U2 busses(5)
		c. Station Blackout (SBO) - LOOP with Turbine Trip and failure of both EDGs UFSAR Table 15.2.13-2 UFSAR §6.2.1.2	1) Automatic Protection • Turbine Trip • Reactor Coolant Flow - Low • SG Water Level - Low • Thermal Margin/Low pressure – trip(6) 2) Manual Trip	• AFW Initiation • EDG Start(3)	• MSSV Lift • SBO cross-tie to U2 busses(5)
		d. RCP Seized Rotor UFSAR §15.3.4.2	1) Automatic Protection • Reactor Coolant Flow - Low trip • Turbine Trip • Pressurizer Pressure - High(4) 2) Manual Trip		•PZR Spray •PORV Opening •PZR Safety Valve Lifting
4. Pressurizer Pressure - High	Reactor Trip	a. Uncontrolled CEA Withdrawal - Zero power UFSAR §15.2.1.1	1. Automatic Protection •Startup Rate - High(1) •Power Level - High •Pressurizer Pressure - High •Thermal Margin/Low Pressure •SG Water Level - Low 2. Diverse Scram System 3. Manual Initiation	• AFW Initiation	•PZR Spray •PORV Opening •PZR Safety Valve Lifting •Rod Withdrawal Prohibit

Table 1 - Unit 1 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips**	**ESF Actuations**	**Other Safety Equipment**
		b. Loss of External Electrical Load and/or Turbine Stop Valve Closure UFSAR §15.2.7.2.1	1. Automatic Protection • Pressurizer Pressure - High trip • Turbine Trip(3) 2. Diverse Scram System 3. Manual Initiation		• MSSV Lift• PZR Safety Valve Lift• PZR Spray(3)• PZR PORV(3)• Steam Dump Bypass(3)
		c. CVCS Malfunction - Pzr Level Controller UFSAR §15.2.14	1. Automatic Protection • Pressurizer Pressure - High trip 2. Diverse Scram System 3. Manual Initiation		• PZR Spray Valves Open • PZR Safety Valve Lift • PZR LEVEL HI alarm
		d. Uncontrolled CEA Withdrawal - Full power UFSAR §15.2.1.2.2	1. Automatic Protection • Power Level - High • Thermal Margin/Low Pressure • Local Power Density - High • Pressurizer Pressure - High 2. Diverse Scram System 3. Manual Initiation		•PORV Opening
		e. RCP Seized Rotor UFSAR §15.3.4.2	1. Automatic Protection • Reactor Coolant Flow - Low trip • Turbine Trip • Pressurizer Pressure - High(4) 2. Diverse Scram System 3. Manual Initiation		•PZR Spray •PORV Opening •PZR Safety Valve Lifting
5. Containment Pressure - High	Reactor Trip	a.Small Break LOCA with LOOP UFSAR §15.3.1	1) Automatic Protection • Thermal Margin/Low Pressure trip • Containment Pressure high trip • SG Water Level - Low(4) 2) Manual Trip	• SIAS • CIAS • SI tanks inject into RCS • AFW Initiation	• PZR LEVEL LOW alarm
		b. Large Break LOCA UFSAR §15.4.1	1) Automatic Protection • Thermal Margin/Low Pressure trip(2) • Containment Pressure high trip 2) Manual Trip	• SIAS • CIAS • SI tanks inject into RCS • CSAS • RAS	• PZR LEVEL LOW alarm • Control Room (CR) Ventilation on recirc

Table 1 - Unit 1 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips**	**ESF Actuations**	**Other Safety Equipment**
		c. MSLB inside containment UFSAR §15.4.6	1) Automatic Protection • Power Level - High trip • Asymmetric SG Pressure - High trip • SG Pressure Low Trip(4) • Turbine trip(4) • SG Water Level low trip(4) • Containment Pressure High trip 2) Manual Trip	• AFW Initiation • MSIS • SIAS • CIAS • CSAS • AFW Isolation(3)	•SG ADVs
6. Steam Generator Pressure - Low	Reactor Trip	a. MSLB outside containment UFSAR §15.4.6	1) Automatic Protection • Power Level - High trip • Asymmetric SG Pressure - High trip • SG Pressure Low Trip(4) • Turbine trip(4) • SG Water Level low trip(4) 2) Manual Trip	• AFW Initiation • MSIS • SIAS • CIAS • CSAS • AFW Isolation(3)	•SG ADVs • CR Ventilation on Recirc
		b. Excess Steam Load-Open All Steam Dump Bypass UFSAR §15.2.11.2.4	1) Automatic Protection • Power Level - High • Thermal Margin/Low Pressure Trip •SG Water Level - Low(4) •SG Pressure - Low(4) 2) Manual Trip	• AFW Initiation • SIAS • CIAS • MSIS	
7. Steam Generator Water Level - Low	Reactor Trip	a. Loss of Normal Feedwater UFSAR §15.2.8.2	1) Automatic Protection • Turbine Trip • SG Water Level - low trip 2) Manual Trip	• AFW Initiation	• MSSV Lift
		b. Loss of Offsite Power (LOOP) UFSAR §15.2.9.1	1) Automatic Protection • Turbine Trip • Reactor Coolant Flow - Low trip • SG Water Level low trip 2) Manual Trip	• AFW Initiation • EDG Start(3)	• MSSV Lift • SBO cross-tie to U2 busses(5)
		c. Station Blackout (SBO) - LOOP with Turbine Trip and failure of both EDGs UFSAR Table 15.2.13-2 UFSAR §6.2.1.2	1) Automatic Protection • Turbine Trip • Reactor Coolant Flow - Low • SG Water Level - Low • Thermal Margin/Low pressure – trip(6) 2) Manual Trip	• AFW Initiation • EDG Start(3)	• MSSV Lift • SBO cross-tie to U2 busses(5)
		d. Uncontrolled CEA Withdrawal - Zero power UFSAR §15.2.1.1	1) Automatic Protection •Startup Rate - High(1) •Power Level - High •Pressurizer Pressure - High •Thermal Margin/Low Pressure •SG Water Level - Low 2) Manual Trip	• AFW Initiation	•PZR Spray •PORV Opening •PZR Safety Valve Lifting •Rod Withdrawal Prohibit

Table 1 - Unit 1 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips**	**ESF Actuations**	**Other Safety Equipment**
		e. Inadvertent Closure of Main Steam Isolation Valve (MSIV) UFSAR §15.2.2.1	1) Automatic Protection • Asymmetric SG Pressure Difference – High • SG Water Level Low 2) Manual Trip	• AFW Initiation	• MSSV Lift
		f. Excess Steam Load-Open All Steam Dump Bypass UFSAR §15.2.11.2.4	1) Automatic Protection • Power Level - High • Thermal Margin/Low Pressure Trip •SG Water Level - Low(4) •SG Pressure - Low(4) 2) Manual Trip	• AFW Initiation • SIAS • CIAS • MSIS	
		g. Inadvertent Opening of Both PORV UFSAR §15.2.12.2	1) Automatic Protection • Thermal Margin/Low Pressure trip • SG Water Level - Low(4) 2) Manual Trip	• AFW Initiation • SIAS • CIAS	• MSSV Lift
8. Local Power Density - High	Reactor Trip	a. Uncontrolled CEA Withdrawal - Full power UFSAR §15.2.1.1	1) Automatic Protection • Power Level - High • Thermal Margin/Low Pressure • Local Power Density - High 2) Manual Trip		•PORV Opening
9. Thermal Margin/Low Pressure	Reactor Trip	a. Uncontrolled CEA Withdrawal - Full power UFSAR §15.2.1.1	1) Automatic Protection • Power Level - High • Thermal Margin/Low Pressure • Local Power Density - High 2) Manual Trip		•PORV Opening
		b. Uncontrolled CEA Withdrawal - Zero power UFSAR §15.2.1.1	1) Automatic Protection •Startup Rate - High(1) •Power Level - High •Pressurizer Pressure - High •Thermal Margin/Low Pressure •SG Water Level - Low 2) Manual Trip	• AFW Initiation	•PZR Spray •PORV Opening •PZR Safety Valve Lifting •Rod Withdrawal Prohibit
		c. CEA Drop Accident UFSAR §15.2.3.2	1) Automatic Protection • Power Level - High trip • Thermal Margin/Low Pressure trip 2) Manual Trip		•CEA position deviation alarms
		c. CVCS Malfunction -Boron Dilution UFSAR §15.2.4.2.1	1) Automatic Protection • Power Level - High • Thermal Margin/Low Pressure Trip 2) Manual Trip		•BORON DILUTION alarm

Table 1 - Unit 1 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips**	**ESF Actuations**	**Other Safety Equipment**
		e. Inadvertent Opening of Both PORV UFSAR §15.2.12.2	1) Automatic Protection • Thermal Margin/Low Pressure trip • SG Water Level - Low(4) 2) Manual Trip	• AFW Initiation • SIAS • CIAS	• MSSV Lift
		f.Small Break LOCA UFSAR §15.3.1	1) Automatic Protection • Thermal Margin/Low Pressure trip • Containment Pressure high trip 2) Manual Trip	• SIAS • CIAS • SI tanks inject into RCS	• PZR LEVEL LOW alarm
		g. Large Break LOCA UFSAR §15.4.1	1) Automatic Protection • Thermal Margin/Low Pressure trip(2) • Containment Pressure high trip 2) Manual Trip	• SIAS • CIAS • SI tanks inject into RCS • CSAS	• PZR LEVEL LOW alarm • Control Room Ventilation on recirc
		h. Steam Generator Tube Rupture UFSAR §15.4.4	1) Automatic Protection • Thermal Margin/Low Pressure trip • Turbine trip 2) Manual Trip	• AFW Initiation • SIAS • CIAS	• MSSV Lift • SG Blowdown Rad Monitors (RMs) • MS Line RMs • Condenser Air Ejector RMs • CR Ventilation on Recirc • Steam Dump Bypass(3)
		i. Excess Steam Load-Open All Steam Dump Bypass UFSAR §15.2.11.2.4	1) Automatic Protection • Power Level - High • Thermal Margin/Low Pressure Trip •SG Water Level - Low(4) •SG Pressure - Low(4) 2) Manual Trip	• AFW Initiation • SIAS • MSIS	
9a. Steam Generator Pressure Difference - High	Reactor Trip	a. Inadvertent Closure of Main Steam Isolation Valve (MSIV) UFSAR §15.2.2.1	1) Automatic Protection • Asymmetric SG Pressure - High trip • SG Water Level Low Trip 2) Manual Trip	• AFW Initiation	• MSSV Lift

Table 1 - Unit 1 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips**	**ESF Actuations**	**Other Safety Equipment**
		b. MSLB outside containment UFSAR §15.4.6	1) Automatic Protection • Power Level - High trip • Asymmetric SG Pressure - High trip • SG Pressure Low Trip(4) • Turbine trip(4) • SG Water Level low trip(4) 2) Manual Trip	• AFW Initiation • MSIS • SIAS • CIAS • CSAS • AFW Isolation(3)	•SG ADVs • CR Ventilation on Recirc
10. Loss of Turbine – Hydraulic Fluid Pressure - Low	Reactor Trip	a. Loss of External Electrical Load and/or Turbine Stop Valve Closure UFSAR §15.2.7.2.1	1) Automatic Protection • Pressurizer Pressure - High trip • Turbine Trip(3) 2) Manual Trip		• MSSV Lift • PZR Safety Valve Lift • PZR Spray(3) • PZR PORV(3) • Steam Dump Bypass(3)
		b. LOOP UFSAR §15.2.9.1	1) Automatic Protection • Turbine Trip • Reactor Coolant Flow - Low trip • SG Water Level low trip 2) Manual Trip	• AFW Initiation • EDG Start(3)	• MSSV Lift • SBO cross-tie to U2 busses(5)
		c. Feedwater Malfunction - Decrease in Feed Temperature or Increase in Feed Flow UFSAR §15.2.10	BOUNDED BY OTHER EVENTS • Turbine Trip on Hi-Hi SG Level		
		d. Diverse Turbine Trip UFSAR §7.6.1.4.2	1. Opens MG set load contactors • Pressurizer Pressure - High 2. Manual Reactor Trip		
		e. Station Blackout (SBO) - LOOP with Turbine Trip and failure of both EDGs UFSAR Table 15.2.13-2 UFSAR §6.2.1.2	1) Automatic Protection • Turbine Trip • Reactor Coolant Flow - Low • SG Water Level - Low • Thermal Margin/Low pressure – trip(6) 2) Manual Trip	• AFW Initiation • EDG Start(3)	• MSSV Lift • SBO cross-tie to U2 busses(5)
11. Wide Range Logarithmic Neutron Flux Monitor a. Startup and Operating – Rate of Change of Power -	Reactor Trip	Not credited in any of the Chapter 15 accident analysis. UFSAR §7.2.1.2.b)	Manual Trip		

Table 1 - Unit 1 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips**	**ESF Actuations**	**Other Safety Equipment**
High[(1)] b. Shutdown					

Notes:
(1) Startup rate is conservatively not credited in any of the Chapter 15 accident analysis. However, the presence of this trip function precludes the need for specific analysis of other events initiated from subcritical conditions.
(2) Reactor trip on low pressurizer pressure is conservatively neglected in analysis. Reactor is shutdown by coolant voiding in the core.
(3) Protective function is conservatively omitted in the computer accident analysis.
(4) Reactor trip occurring prior to analyzed ESFS function (e.g., AFW Initiation), or other plant safety equipment (e.g., PZR safety valve lifting).
(5) U1 UFSAR §8.3.1.1.1
(6) TM/LP Reactor Trip on low pressure due to RCP Seal Leakage.

Table 2 - Unit 1 ESFS Instrumentation Diversity			
ESFS Instrument	**Safety Feature**	**Accident Condition**	**Diverse Protection**
Containment Pressure - High	Safety Injection	SBLOCA	1. Automatic SI a. Pressurizer pressure (low) b. Containment pressure (high) 2. Manual SIAS
		LBLOCA	1. Automatic SI a. Pressurizer pressure (low) b. Containment pressure (high) 2. Manual SIAS
		MSLB inside containment	1. Automatic SI a. Pressurizer pressure (low) b. Containment pressure (high) 2. Manual SIAS
	Containment Isolation	SBLOCA	1. Automatic Containment Isolation a. Containment pressure (high) b. Containment radiation (high) 2. Manual CIAS
		LBLOCA	1. Automatic Containment Isolation a. Containment pressure (high) b. Containment radiation (high) 2. Manual CIAS
		MSLB inside containment	1. Automatic Containment Isolation a. Containment pressure (high) b. Containment radiation (high) 2. Manual CIAS
Containment Pressure - High-High (coincident with SI)	Containment Spray Actuation	SBLOCA	1. Automatic Containment Isolation a. Containment pressure (high-high) 2. Manual CSAS
		LBLOCA	1. Automatic Containment Isolation a. Containment pressure (high-high) 2. Manual CSAS
		MSLB inside containment	1. Automatic Containment Isolation a. Containment pressure (high-high) 2. Manual CSAS
Containment Radiation - High	Containment Isolation	SBLOCA	1. Automatic Containment Isolation a. Containment pressure (high) b. Containment radiation (high) 2. Manual CIAS
		LBLOCA	1. Automatic Containment Isolation a. Containment pressure (high) b. Containment radiation (high) 2. Manual CIAS
		MSLB inside containment	1. Automatic Containment Isolation a. Containment pressure (high) b. Containment radiation (high) 2. Manual CIAS

Table 2 - Unit 1 ESFS Instrumentation Diversity			
ESFS Instrument	**Safety Feature**	**Accident Condition**	**Diverse Protection**
Pressurizer Pressure - Low-Low	Safety Injection	SBLOCA	1. Automatic SI a. Pressurizer pressure (low) b. Containment pressure (high) 2. Manual SIAS
		LBLOCA	1. Automatic SI a. Pressurizer pressure (low) b. Containment pressure (high) 2. Manual SIAS
		MSLB inside containment	1. Automatic SI a. Pressurizer pressure (low) b. Containment pressure (high) 2. Manual SIAS
		MSLB outside containment	1. Automatic SI a. Pressurizer pressure (low) 2. Manual SIAS
		SGTR	1. Automatic SI a. Pressurizer pressure (low) 2. Manual SIAS
		Excess Steam Load-Open All Steam Dump Bypass	1. Automatic SI a. Pressurizer pressure (low) 2. Manual SIAS
		Inadv Opening of PORV	1. Automatic SI a. Pressurizer pressure (low) b. Containment pressure (high) 2. Manual SIAS
SG Pressure - Low	Main Steam Isolation & Main Feed Isolation	MSLB inside containment	1. Automatic MSIS a. SG pressure (low) 2. Manual MSIS
		MSLB outside containment	1. Automatic MSIS a. SG pressure (low) 2. Manual MSIS
		Excess Steam Load-Open All Steam Dump Bypass	1. Automatic MSIS a. SG pressure (low) 2. Manual MSIS
Refueling Water Tank (RWT) Level - Low	Containment Sump Recirc	SBLOCA	1. Automatic RAS a. RWT Level (low) 2. Manual RAS
		LBLOCA	1. Automatic RAS a. RWT Level (low) 2. Manual RAS
		MSLB inside containment	1. Automatic RAS a. RWT Level (low) 2. Manual RAS
SG Level (1A/1B) - Low	Aux Feedwater Initiation	MSLB inside containment	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation

Table 2 - Unit 1 ESFS Instrumentation Diversity			
ESFS Instrument	**Safety Feature**	**Accident Condition**	**Diverse Protection**
		MSLB outside containment	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation
		SBO	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation
		LOOP	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation
		SGTR	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation
		Uncontrolled Control Element Assembly (CEA) Withdrawal - Zero power	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation
		Excess Steam Load-Open All Steam Dump Bypass	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation
		Inadvertent Closure of Main Steam Isolation Valve (MSIV)	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation
		Inadvertent Opening of Both PORV	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation
		Loss of Normal Feedwater	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation
SG1A - SG1B Differential Pressure - High	Aux Feedwater Isolation	MSLB inside containment	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
		MSLB outside containment	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
		SGTR	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
		Inadv Closure of MSIV	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation

Table 2 - Unit 1 ESFS Instrumentation Diversity			
ESFS Instrument	**Safety Feature**	**Accident Condition**	**Diverse Protection**
Feedwater Header 1A - 1B Differential Pressure	Aux Feedwater Isolation	MSLB inside containment	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
		MSLB outside	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
		SGTR	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
		Loss of Normal Feedwater	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
4.16kv Emer Bus Loss of Voltage	Load Shed & EDG Start	SBO	1. Automatic Load Shed & EDG Start a. 4.16kV Emerg Bus Degraded Voltage b..480V Emerg Bus Degraded Voltage 2. Manual Load Shed & EDG Start 3. SBO Cross-tie to Unit 2
		LOOP	1. Automatic Load Shed & EDG Start a. 4.16kV Emerg Bus Degraded Voltage b..480V Emerg Bus Degraded Voltage 2. Manual Load Shed & EDG Start 3. SBO Cross-tie to Unit 2
4.16kv Emer Bus Degraded Voltage	Load Shed & EDG Start	SBO	1. Automatic Load Shed & EDG Start a. 480V Emerg Bus Degraded Voltage 2. Manual Load Shed & EDG Start 3. SBO Cross-tie to Unit 2
		LOOP	1. Automatic Load Shed & EDG Start a. 480V Emerg Bus Degraded Voltage 2. Manual Load Shed & EDG Start 3. SBO Cross-tie to Unit 2
480V Emer Bus Degraded Voltage	Load Shed & EDG Start	SBO	1. Automatic Load Shed & EDG Start a. 4.16kV Emerg Bus Degraded Voltage b. 4.16kV Emerg Bus UV 2. Manual Load Shed & EDG Start 3. SBO Cross-tie to Unit 2
		LOOP	1. Automatic Load Shed & EDG Start a. 4.16kV Emerg Bus Degraded Voltage b. 4.16kV Emerg Bus UV 2. Manual Load Shed & EDG Start 3. SBO Cross-tie to Unit 2

Table 3 - Unit 2 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips[(1)]**	**ESF Actuations**	**Other Safety Equipment**
1. Manual Reactor Trip	Reactor Trip	a. Automatic actuation failed b. Operator training UFSAR §7.2.1.1.1.12	1) Two sets of Reactor Trip pushbuttons 2) MG set output breakers 3) MG set Load Contactors 4) Reactor Trip Breakers		
2. Variable Power Level - High	Reactor Trip	Decrease in Feedwater Temperature UFSAR §15.1.1.1	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure • SG Pressure Low 2. Manual Initiation	• MSIS	• MSSVs Lift • MSIVs Close
		Increase in Feedwater Flow UFSAR §15.1.2.2	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure - Low Pressure • SG Pressure Low • Reactor Trip on Turbine Trip 2. Manual Initiation	• MSIS	• Hi-Hi SG Level Terminates FW • MSSVs Lift • MSIVs Close
		Excess Steam Load-Hot Zero Power UFSAR §15.1.3.4 Table 15.1.3-1	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure • SG Level Low[(3)] • SG Pressure Low[(3)] 2. Manual Initiation	• AFW Initiation • MSIS • SIAS	• MFIVs close • MSIVs close
		Inadvertent Opening of SG Relief or Safety Valve UFSAR §15.1.4.2	1. Automatic Reactor Trips • Variable High Power • SG Pressure Low • SG Level Low • SG Pressure Difference High • Thermal Margin/Low Pressure • Thermal Margin/Low Pressure-Low Pressure 2. Manual Initiation	• MFIS • MSIS • AFW on SG Level Low • AFW Isolation to faulted SG on SG High Delta-P or Main Feedwater Delta-P	• MFIVs close • MSIVs close
		Pre-Trip Steamline Break (coincident with LOOP) UFSAR §15.1.5.4 Table 15.1.5-1b	1. Automatic Reactor Trips • Variable High Power • SG Pressure Low • SG Level Low • SG Pressure Difference High • Thermal Margin/Low Pressure • Thermal Margin/Low Pressure-Low Pressure • Low RCS Flow 2. Manual Initiation	• MFIS • MSIS • AFW on SG Level Low • AFW Isolation to faulted SG on SG High Delta-P or Main Feedwater Delta-P	• MFIVs close • MSIVs close
		Uncontrolled CEA Bank Withdrawal from subcritical UFSAR §15.4.1	1. Automatic Reactor Trips • Variable High Power • SUR High 2. Manual Initiation		• PZR Spray open

Table 3 - Unit 2 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips[(1)]**	**ESF Actuations**	**Other Safety Equipment**
		Uncontrolled CEA Bank Withdrawal from power UFSAR §15.4.2.1	1. Automatic Reactor Trips• Variable High Power• Pressurizer Pressure High• Thermal Margin/Low Pressure• Local Power Density High2. Manual Initiation		• PZR PORVs open[(3)]• PZR Spray open[(3)]• MSSVs Lift• Steam Dump & Bypass System[(3)]• SG ADVs[(3)]
		Dropped Rod UFSAR §15.4.3.1	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure - Low Pressure • SG Pressure Low 2. Manual Initiation		
		Boron Dilution UFSAR §15.4.6.2	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure • Pressurizer Pressure High 2. Manual Initiation		• PZR PORVs open[(3)] • PZR Spray open[(3)] • MSSVs Lift • Steam Dump & Bypass System[(3)] • SG ADVs[(3)]
		CEA Ejection UFSAR §15.4.8.2	1. Automatic Reactor Trips • Variable High Power • SUR High 2. Manual Initiation		
3. Pressurizer Pressure - High	Reactor Trip	Loss of Condenser Vacuum UFSAR §15.2.3.3	1. Automatic Reactor Trips • Pressurizer Pressure - High • Thermal Margin/Low Pressure • SG Level Low • Turbine Trip[(3)] 2. Diverse Scram System 3. Manual Initiation		• PZR Safety Valves Lift • PZR PORVs open[(3)] • PZR Spray open[(3)] • MSSVs Lift • Steam Dump & Bypass System[(3)] • SG ADVs[(3)]
		Loss of Normal Feedwater Flow UFSAR §15.2.7.3	1. Automatic Reactor Trips • Pressurizer Pressure - High • SG Level Low • Turbine Trip[(3)] 2. Diverse Scram System 3. Manual Initiation	• AFW Initiation	• PZR PORVs open • PZR Spray open • MSSVs Lift • Steam Dump & Bypass System[(3)] • SG ADVs[(3)]
		LOOP UFSAR §15.2.7.3	1. Automatic Reactor Trips • Pressurizer Pressure - High • SG Level Low • Reactor Coolant Flow Low 2. Diverse Scram System 3. Manual Initiation	• AFW Initiation	• PZR Safety Valves Lift • PZR PORVs open[(3)] • PZR Spray open[(3)] • MSSVs Lift • Steam Dump & Bypass System[(3)] • SG ADVs[(3)] • SBO cross-tie to U1 busses[(5)]

Table 3 - Unit 2 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips[(1)]**	**ESF Actuations**	**Other Safety Equipment**
		Feedwater System Pipe Rupture UFSAR §15.2.8.3	1. Automatic Reactor Trips • Pressurizer Pressure – High • SG Pressure Low • SG Level Low • Thermal Margin/Low Pressure • SG Pressure Difference High 2. Diverse Scram System 3. Manual Initiation	• AFW Initiation• MSIS• MFIS	• PZR Safety Valves Lift • PZR PORVs open[(3)] • PZR Spray open[(3)] • MSSVs Lift • Steam Dump & Bypass System[(3)] • SG ADVs[(3)]
		Uncontrolled CEA Bank Withdrawal from power UFSAR §15.4.2.1	1. Automatic Reactor Trips • Variable High Power • Pressurizer Pressure High • Thermal Margin/Low Pressure • Local Power Density High 2. Diverse Scram System 3. Manual Initiation		• PZR PORVs open[(3)] • PZR Spray open[(3)] • MSSVs Lift • Steam Dump & Bypass System[(3)] • SG ADVs[(3)]
		CVCS Malfunction UFSAR §15.5.2.4	1. Automatic Reactor Trips • Pressurizer Pressure - High 2. Diverse Scram System 3. Manual Initiation		• PZR Safety Valves[(3)] • PZR PORVs open[(3)] • PZR Spray open[(3)] • PZR High Level Alarm
		Loss of Non-Emergency AC to Station Auxiliaries UFSAR §15.2.6	1. Automatic Reactor Trips • Reactor Coolant Flow Low • SG Level Low[(4)] • Pressurizer Pressure High[(4)] 2. Diverse Scram System 3. Manual Initiation	• AFW Initiation	• PZR Safety Valves Lift • PZR PORVs open[(3)] • PZR Spray open[(3)] • MSSVs Lift • Steam Dump & Bypass System[(3)] • SG ADVs[(3)] • SBO cross-tie to U1 busses[(5)]
		Boron Dilution UFSAR §15.4.6.2	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure • Pressurizer Pressure High 2. Diverse Scram System 3. Manual Initiation		• PZR PORVs open[(3)] • PZR Spray open[(3)] • MSSVs Lift • Steam Dump & Bypass System[(3)] • SG ADVs[(3)]
4. Thermal Margin/Low Pressure	Reactor Trip	Decrease in Feedwater Temperature UFSAR §15.1.1.1	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure • SG Pressure Low 2. Manual Initiation	• MSIS	• MSSVs Lift • MSIVs Close

Table 3 - Unit 2 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips[(1)]**	**ESF Actuations**	**Other Safety Equipment**
		Increase in Feedwater Flow UFSAR §15.1.2.2	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure - Low Pressure • SG Pressure Low • Reactor Trip on Turbine Trip 2. Manual Initiation	• MSIS	• Hi-Hi SG Level Terminates FW • MSSVs Lift • MSIVs Close
		Excess Steam Load-Hot Zero Power UFSAR §15.1.3.4 Table 15.1.3-1	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure • SG Level Low[(3)] • SG Pressure Low[(3)] 2. Manual Initiation	• AFW Initiation • MSIS • SIAS	• MFIVs close • MSIVs close
		Inadvertent Opening of SG Relief or Safety Valve UFSAR §15.1.4.2	1. Automatic Reactor Trips • Variable High Power • SG Pressure Low • SG Level Low • SG Pressure Difference High • Thermal Margin/Low Pressure • Thermal Margin/Low Pressure-Low Pressure 2. Manual Initiation	• MFIS • MSIS • AFW on SG Level Low • AFW Isolation to faulted SG on SG High Delta-P or Main Feedwater Delta-P	• MFIVs close • MSIVs close
		Pre-Trip Steamline Break (coincident with LOOP) UFSAR §15.1.5.4	1. Automatic Reactor Trips • Variable High Power • SG Pressure Low • SG Level Low • SG Pressure Difference High • Thermal Margin/Low Pressure • Thermal Margin/Low Pressure-Low Pressure • Low RCS Flow 2. Manual Initiation	• MFIS • MSIS • AFW on SG Level Low • AFW Isolation to faulted SG on SG High Delta-P or Main Feedwater Delta-P	• MFIVs close • MSIVs close
		Loss of Condenser Vacuum UFSAR §15.2.3.3	1. Automatic Reactor Trips • Pressurizer Pressure - High • Thermal Margin/Low Pressure • SG Level Low • Turbine Trip[(3)] 2. Manual Initiation		• PZR Safety Valves Lift • PZR PORVs open[(3)] • PZR Spray open[(3)] • MSSVs Lift • Steam Dump & Bypass System[(3)] • SG ADVs[(3)]
		Feedwater System Pipe Rupture UFSAR §15.2.8.3	1. Automatic Reactor Trips • Pressurizer Pressure - High • SG Pressure Low • SG Level Low • Thermal Margin/Low Pressure • SG Pressure Difference	• AFW Initiation • MSIS • MFIS	• PZR Safety Valves Lift • PZR PORVs open[(3)] • PZR Spray open[(3)] • MSSVs Lift • Steam Dump &

Table 3 - Unit 2 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips[(1)]**	**ESF Actuations**	**Other Safety Equipment**
			High 2. Manual Initiation		Bypass System[(3)] • SG ADVs[(3)]
		Uncontrolled CEA Bank Withdrawal from power UFSAR §15.4.2.1	1. Automatic Reactor Trips • Variable High Power • Pressurizer Pressure High • Thermal Margin/Low Pressure • Local Power Density High 2. Manual Initiation		• PZR PORVs open[(3)] • PZR Spray open[(3)] • MSSVs Lift • Steam Dump & Bypass System[(3)] • SG ADVs[(3)]
		Dropped Rod UFSAR §15.4.3.1	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure - Low Pressure • SG Pressure Low 2. Manual Initiation		
		Boron Dilution UFSAR §15.4.6.2	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure • Pressurizer Pressure High 2. Manual Initiation		• PZR PORVs open[(3)] • PZR Spray open[(3)] • MSSVs Lift • Steam Dump & Bypass System[(3)] • SG ADVs[(3)]
		Inadvertent Opening of PORV UFSAR §15.6.1.3	1. Automatic Reactor Trips • Thermal Margin/Low Pressure - Low Pressure 2. Manual Initiation		
		SG Tube Rupture UFSAR §15.6.3.3	1. Automatic Reactor Trips • Thermal Margin/Low Pressure - Low Pressure • SG Level Low[(3)] 2. Manual Initiation	• SIAS • CIAS • AFW Initiation	• MSSVs • SG ADVs[(3)]
		LOCA UFSAR §15.6.5.3	1. Automatic Reactor Trips • Thermal Margin/Low Pressure - Low Pressure 2. Manual Initiation	• SIAS • CIAS • CSAS • RAS	• CVCS
5. Containment Pressure - High	Reactor Trip	LOCA UFSAR Table 6.2-2	1. Automatic Reactor Trips • Thermal Margin/Low Pressure - Low Pressure • Containment Pressure High 2. Manual Initiation	• SIAS • CIAS • CSAS • RAS	• CVCS

Table 3 - Unit 2 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips[1]**	**ESF Actuations**	**Other Safety Equipment**
		MSLB UFSAR Table 6.2-2	1. Automatic Reactor Trips • Variable High Power • SG Pressure Low • SG Level Low • SG Pressure Difference High • Thermal Margin/Low Pressure • Thermal Margin/Low Pressure-Low Pressure • Low RCS Flow 2. Manual Initiation	• MFIS • MSIS • AFW on SG Level Low • AFW Isolation to faulted SG on SG High Delta-P or Main Feedwater Delta-P • SIAS • CIAS • CSAS • RAS	• MFIVs close • MSIVs close
6. Steam Generator Pressure - Low	Reactor Trip	Decrease in Feedwater Temperature UFSAR §15.1.1.1	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure • SG Pressure Low 2. Manual Initiation	• MSIS	• MSSVs Lift • MSIVs Close
		Increase in Feedwater Flow UFSAR §15.1.2.2	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure - Low Pressure • SG Pressure Low • Reactor Trip on Turbine Trip 2. Manual Initiation	• MSIS	• Hi-Hi SG Level Terminates FW • MSSVs Lift • MSIVs Close
		Inadvertent Opening of SG Relief or Safety Valve UFSAR §15.1.4.2	1. Automatic Reactor Trips • Variable High Power • SG Pressure Low • SG Level Low • SG Pressure Difference High • Thermal Margin/Low Pressure • Thermal Margin/Low Pressure-Low Pressure 2. Manual Initiation	• MFIS • MSIS • AFW on SG Level Low • AFW Isolation to faulted SG on SG High Delta-P or Main Feedwater Delta-P	• MFIVs close • MSIVs close
		Excess Steam Load-Hot Zero Power UFSAR §15.1.3.4 Table 15.1.3-1	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure • SG Level Low[3] • SG Pressure Low[3] 2. Manual Initiation	• AFW Initiation • MSIS • SIAS	• MFIVs close • MSIVs close
		Pre-Trip Steamline Break (coincident with LOOP) UFSAR §15.1.5.4	1. Automatic Reactor Trips • Variable High Power • SG Pressure Low • SG Level Low • SG Pressure Difference High • Thermal Margin/Low Pressure • Thermal Margin/Low Pressure-Low Pressure • Low RCS Flow	• MFIS • MSIS • AFW on SG Level Low • AFW Isolation to faulted SG on SG High Delta-P or Main Feedwater Delta-P	• MFIVs close • MSIVs close

Table 3 - Unit 2 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips[(1)]**	**ESF Actuations**	**Other Safety Equipment**
			2. Manual Initiation		
		Feedwater System Pipe Rupture UFSAR §15.2.8.3	1. Automatic Reactor Trips • Pressurizer Pressure - High • SG Pressure Low • SG Level Low[(3)] • Thermal Margin/Low Pressure • SG Pressure Difference High 2. Manual Initiation	• AFW Initiation • MSIS • MFIS	• PZR Safety Valves Lift • PZR PORVs open[(3)] • PZR Spray open[(3)] • MSSVs Lift
		Closure of MSIV UFSAR §15.2.9.3	1. Automatic Reactor Trips • SG Pressure Difference High • SG Pressure Low • SG Level Low 2. Manual Initiation	• MSIS • MFIS	• PZR Spray open • MSSVs Lift
		Dropped Rod UFSAR §15.4.3.3	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure - Low Pressure • SG Pressure Low 2. Manual Initiation		•Turbine Runback[(3)]
7. Steam Generator Pressure Difference - High	Reactor Trip	Inadvertent Opening of SG Relief or Safety Valve UFSAR §15.1.4.2	1. Automatic Reactor Trips • Variable High Power • SG Pressure Low • SG Level Low • SG Pressure Difference High • Thermal Margin/Low Pressure • Thermal Margin/Low Pressure-Low Pressure 2. Manual Initiation	• MFIS • MSIS • AFW on SG Level Low • AFW Isolation to faulted SG on SG High Delta-P or Main Feedwater Delta-P	• MFIVs close • MSIVs close
		Pre-Trip Steamline Break (coincident with LOOP) UFSAR §15.1.5.4	1. Automatic Reactor Trips • Variable High Power • SG Pressure Low • SG Level Low • SG Pressure Difference High • Thermal Margin/Low Pressure • Thermal Margin/Low Pressure-Low Pressure • Low RCS Flow 2. Manual Initiation	• MFIS • MSIS • AFW on SG Level Low • AFW Isolation to faulted SG on SG High Delta-P or Main Feedwater Delta-P	• MFIVs close • MSIVs close

Table 3 - Unit 2 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips[(1)]**	**ESF Actuations**	**Other Safety Equipment**
		Feedwater System Pipe Rupture UFSAR §15.2.8.3	1. Automatic Reactor Trips• Pressurizer Pressure - High• SG Pressure Low• SG Level Low• Thermal Margin/Low Pressure• SG Pressure Difference High2. Manual Initiation	• AFW Initiation• MSIS• MFIS	• PZR Safety Valves Lift• PZR PORVs open[(3)]• PZR Spray open[(3)]• MSSVs Lift• Steam Dump & Bypass System[(3)]• SG ADVs[(3)]
		Closure of MSIV UFSAR §15.2.9.3	1. Automatic Reactor Trips • SG Pressure Difference High • SG Pressure Low • SG Level Low 2. Manual Initiation	• MSIS • MFIS	• PZR Spray open • MSSVs Lift
8. Steam Generator Water Level - Low	Reactor Trip	Inadvertent Opening of SG Relief or Safety Valve UFSAR §15.1.4.2	1. Automatic Reactor Trips • Variable High Power • SG Pressure Low • SG Level Low • SG Pressure Difference High • Thermal Margin/Low Pressure • Thermal Margin/Low Pressure-Low Pressure 2. Manual Initiation	• MFIS • MSIS • AFW on SG Level Low • AFW Isolation to faulted SG on SG High Delta-P or Main Feedwater Delta-P	• MFIVs close • MSIVs close
		Pre-Trip Steamline Break (coincident with LOOP) UFSAR §15.1.5.4	1. Automatic Reactor Trips • Variable High Power • SG Pressure Low • SG Level Low • SG Pressure Difference High • Thermal Margin/Low Pressure • Thermal Margin/Low Pressure-Low Pressure • Low RCS Flow 2. Manual Initiation	• MFIS • MSIS • AFW on SG Level Low • AFW Isolation to faulted SG on SG High Delta-P or Main Feedwater Delta-P	• MFIVs close • MSIVs close
		Loss of Condenser Vacuum UFSAR §15.2.3.3	1. Automatic Reactor Trips • Pressurizer Pressure - High • Thermal Margin/Low Pressure • SG Level Low 2. Manual Initiation	N/A	• PZR Safety Valves Lift • PZR PORVs open[(3)] • PZR Spray open[(3)] • MSSVs Lift • Steam Dump & Bypass System[(3)] • SG ADVs[(3)]
		Loss of Normal Feedwater Flow UFSAR §15.2.7.3	1. Automatic Reactor Trips • Pressurizer Pressure - High • SG Level Low • Turbine Trip[(3)] 2. Manual Initiation	• AFW Initiation	• PZR PORVs open • PZR Spray open • MSSVs Lift • Steam Dump & Bypass System[(3)] • SG ADVs[(3)]

Table 3 - Unit 2 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips[1]**	**ESF Actuations**	**Other Safety Equipment**
		Feedwater System Pipe Rupture UFSAR §15.2.8.3	1. Automatic Reactor Trips • Pressurizer Pressure - High • SG Pressure Low • SG Level Low • Thermal Margin/Low Pressure • SG Pressure Difference High 2. Manual Initiation	• AFW Initiation • MSIS • MFIS	• PZR Safety Valves Lift • PZR PORVs open[3] • PZR Spray open[3] • MSSVs Lift • Steam Dump & Bypass System[3] • SG ADVs[3]
		Closure of MSIV UFSAR §15.2.9.3	1. Automatic Reactor Trips • SG Pressure Difference High • SG Pressure Low • SG Level Low 2. Manual Initiation	• MSIS • MFIS	• PZR Spray open • MSSVs Lift
		Excess Steam Load-Hot Zero Power UFSAR §15.1.3.4 Table 15.1.3-1	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure • SG Level Low[3] • SG Pressure Low[3] 2. Manual Initiation	• AFW Initiation • MSIS • SIAS	• MFIVs close • MSIVs close
		Loss of Non-Emergency AC to Station Auxiliaries UFSAR §15.2.6.3	1. Automatic Reactor Trips • Reactor Coolant Flow Low • SG Level Low[4] • Pressurizer Pressure High[4] 2. Manual Initiation	• AFW Initiation	• PZR Safety Valves Lift • PZR PORVs open[3] • PZR Spray open[3] • MSSVs Lift • Steam Dump & Bypass System[3] • SG ADVs[3] • SBO cross-tie to U1 busses[5]
9. Local Power Density - High	Reactor Trip	Uncontrolled CEA Bank Withdrawal from power UFSAR §15.4.2.1	1. Automatic Reactor Trips • Variable High Power • Pressurizer Pressure High • Thermal Margin/Low Pressure • Local Power Density High 2. Manual Initiation	N/A	• PZR PORVs open[3] • PZR Spray open[3] • MSSVs Lift • Steam Dump & Bypass System[3] • SG ADVs[3]
10. Loss of Component Cooling Water to RCP - Low	Reactor Trip	Loss of Cooling Water to RCP Seals UFSAR §7.2.1.1.1.11	Bounded by SBLOCA		

Table 3 - Unit 2 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips[1]**	**ESF Actuations**	**Other Safety Equipment**
		Loss of Cooling Water to RCP Motor Oil Coolers UFSAR §7.2.1.1.1.11	Bounded by RCP Seized Rotor		
13. Rate of Change of Power - High	Reactor Trip	Uncontrolled CEA Bank Withdrawal from subcritical UFSAR §15.4.1	1. Automatic Reactor Trips • Variable High Power • SUR High 2. Manual Initiation	N/A	• PZR Spray open
		CEA Ejection UFSAR §15.4.8.2	1. Automatic Reactor Trips • Variable High Power • SUR High 2. Manual Initiation	N/A	N/A
14. Reactor Coolant Flow - Low	Reactor Trip	Pre-Trip Steamline Break (coincident with LOOP) UFSAR §15.1.5.4	1. Automatic Reactor Trips • Variable High Power • SG Pressure Low • SG Level Low • SG Pressure Difference High • Thermal Margin/Low Pressure • Thermal Margin/Low Pressure-Low Pressure • Low RCS Flow 2. Manual Initiation	• MFIS • MSIS • AFW on SG Level Low • AFW Isolation to faulted SG on SG High Delta-P or Main Feedwater Delta-P	• MFIVs close • MSIVs close
		Loss of Non-Emergency AC to Station Auxiliaries UFSAR §15.2.6.3	1. Automatic Reactor Trips • Reactor Coolant Flow Low • SG Level Low[4] • Pressurizer Pressure High[4] 2. Manual Initiation	• AFW Initiation	• PZR Safety Valves Lift • PZR PORVs open[3] • PZR Spray open[3] • MSSVs Lift • Steam Dump & Bypass System[3] • SG ADVs[3] • SBO cross-tie to U1 busses[5]
		LOOP UFSAR §15.2.7.3	1. Automatic Reactor Trips • Pressurizer Pressure - High • SG Level Low • Reactor Coolant Flow Low 2. Manual Initiation	• AFW Initiation	• PZR Safety Valves Lift • PZR PORVs open[3] • PZR Spray open[3] • MSSVs Lift • Steam Dump & Bypass System[3] • SG ADVs[3] • SBO cross-tie to U1 busses[5]
		Partial/Complete Loss of Forced Flow	1. Automatic Reactor Trips • Reactor Coolant Flow Low	N/A	• Steam Dump & Bypass System • PZR Spray open

Table 3 - Unit 2 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips[1]**	**ESF Actuations**	**Other Safety Equipment**
		UFSAR §15.3.2	2. Manual Initiation		
		RCP Seized Rotor UFSAR §15.3.3	1. Automatic Reactor Trips • Reactor Coolant Flow Low • Pressurizer Pressure High[4] 2. Manual Initiation	N/A	• PZR Safety Valves Lift • PZR PORVs open[3] • PZR Spray open[3] • MSSVs Lift • Steam Dump & Bypass System[3] • SG ADVs[3]
15. Loss of Turbine – Hydraulic Fluid Pressure - Low	Reactor Trip	Increase in Feedwater Flow UFSAR §15.1.2.2	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure - Low Pressure • SG Pressure Low • Reactor Trip on Turbine Trip 2. Manual Initiation	• MSIS	• Hi-Hi SG Level Terminates FW • MSSVs Lift • MSIVs Close • MFIVs close
		Decrease in Feedwater Temperature UFSAR §15.1.1.1	1. Automatic Reactor Trips • Variable High Power • Thermal Margin/Low Pressure • SG Pressure Low • Turbine Trip[3] 2. Manual Initiation	• MSIS	• MSSVs Lift • MSIVs Close
		Loss of Condenser Vacuum UFSAR §15.2.3.3	1. Automatic Reactor Trips • Pressurizer Pressure - High • Thermal Margin/Low Pressure • SG Level Low • Turbine Trip[3] 2. Manual Initiation	N/A	• PZR Safety Valves Lift • PZR PORVs open[3] • PZR Spray open[3] • MSSVs Lift • Steam Dump & Bypass System[3] • SG ADVs[3]
		Diverse Turbine Trip UFSAR §7.6.3.11.2	1. Opens MG set load contactors • Pressurizer Pressure - High 2. Manual Reactor Trip		
		• Turbine Overspeed • Thrust Bearing Position • Exhaust Hood Temperature • Condenser Vacuum • Bearing Oil Pressure • ET Header Pressure	Anticipatory Loss of Load Reactor Trip on Turbine Trip		

Table 3 - Unit 2 RPS Instrumentation Diversity					
FUNCTION	**Safety Function**	**Plant Condition / Accident**	**Diverse Reactor Trips(1)**	**ESF Actuations**	**Other Safety Equipment**
N/A	Maintain Reactor Shutdown	Post-Trip Steam System Piping Failure UFSAR §15.1.6.1 Table 15.1.6-1	• Injected Boric Acid from Safety Injection Tanks • Injected Boric Acid from ECCS pumps • SG Dryout	• SIAS on PZR Pressure Low or Containment Pressure High • CIAS • MSIS on SG Pressure Low or Containment Pressure High • AFW Initiation on SG Level Low • AFW Isolation to faulted SG on SG High Delta-P or Main Feedwater Delta-P	• MFIVs close • MSIVs close

Notes:
(1) Majority of this table found in U2 UFSAR Table 15.0-30
(2) Deleted
(3) Protective function is conservatively omitted in the computer accident analysis.
(4) Reactor trip occurring prior to analyzed ESFS function (e.g., AFW Initiation), or other plant safety equipment (e.g., PZR safety valve lifting).
(5) UFSAR §8.3.1.1.2.p

Table 4 - Unit 2 ESFS Instrumentation Diversity			
ESFS Instrument	**Safety Feature**	**Accident Condition**	**Diverse Protection**
Containment Pressure - High	Safety Injection	SBLOCA	1. Automatic SI a. Pressurizer pressure (low) b. Containment pressure (high) 2. Manual SIAS
		LBLOCA	1. Automatic SI a. Pressurizer pressure (low) b. Containment pressure (high) 2. Manual SIAS
		MSLB inside containment	1. Automatic SI a. Pressurizer pressure (low) b. Containment pressure (high) 2. Manual SIAS
	Containment Isolation	SBLOCA	1. Automatic Containment Isolation a. Containment pressure (high) b. Containment radiation (high) c. Safety Injection signal 2. Manual CIAS
		LBLOCA	1. Automatic Containment Isolation a. Containment pressure (high) b. Containment radiation (high) c. Safety Injection signal 2. Manual CIAS
		MSLB inside containment	1. Automatic Containment Isolation a. Containment pressure (high) b. Containment radiation (high) c. Safety Injection signal 2. Manual CIAS
	Main Steam Isolation & Main Feed Isolation	MSLB inside containment	1. Automatic Main Steam Isolation a. Containment pressure (high) b. SG Pressure (Low) 2. Manual MSIS
Containment Pressure - High-High (coincident with SI)	Containment Spray Actuation	SBLOCA	1. Automatic Containment Spray a. Containment pressure (high-high) 2. Manual CSAS
		LBLOCA	1. Automatic Containment Spray a. Containment pressure (high-high) 2. Manual CSAS
		Post-Reactor Trip MSLB inside containment	1. Automatic Containment Spray a. Containment pressure (high-high) 2. Manual CSAS

Table 4 - Unit 2 ESFS Instrumentation Diversity			
ESFS Instrument	**Safety Feature**	**Accident Condition**	**Diverse Protection**
Containment Radiation - High	Containment Isolation	SBLOCA	1. Automatic Containment Isolation a. Containment pressure (high) b. Containment radiation (high) 2. Manual CIAS
		LBLOCA	1. Automatic Containment Isolation a. Containment pressure (high) b. Containment radiation (high) 2. Manual CIAS
		MSLB inside containment	1. Automatic Containment Isolation a. Containment pressure (high) b. Containment radiation (high) 2. Manual CIAS
Pressurizer Pressure - Low	Safety Injection	SBLOCA	1. Automatic SI a. Pressurizer pressure (low) b. Containment pressure (high) 2. Manual SIAS
		LBLOCA	1. Automatic SI a. Pressurizer pressure (low) b. Containment pressure (high) 2. Manual SIAS
		MSLB inside containment	1. Automatic SI a. Pressurizer pressure (low) b. Containment pressure (high) 2. Manual SIAS
		MSLB outside containment	1. Automatic SI a. Pressurizer pressure (low) 2. Manual SIAS
		SGTR	1. Automatic SI a. Pressurizer pressure (low) 2. Manual SIAS
		Inadv Opening of PORV	1. Automatic SI a. Pressurizer pressure (low) b. Containment pressure (high) 2. Manual SIAS
SG Pressure - Low-Low	Main Steam Isolation & Main Feed Isolation	MSLB inside containment	1. Automatic MSIS a. Containment pressure (high) b. SG Pressure (Low) 2. Manual MSIS
		MSLB outside containment	1. Automatic MSIS a. SG Pressure (Low) 2. Manual MSIS
		Decrease in Feedwater Temperature	1. Automatic MSIS a. SG Pressure (Low) 2. Manual MSIS

Table 4 - Unit 2 ESFS Instrumentation Diversity			
ESFS Instrument	**Safety Feature**	**Accident Condition**	**Diverse Protection**
		Increase in Feedwater Flow	1. Automatic MSIS a. SG Pressure (Low) 2. Manual MSIS
		Excess Steam Load	1. Automatic MSIS a. SG Pressure (Low) 2. Manual MSIS
		Inadvertent Opening of SG Relief or MSSV	1. Automatic MSIS a. SG Pressure (Low) 2. Manual MSIS
		Feedwater Pipe Rupture	1. Automatic MSIS a. SG Pressure (Low) 2. Manual MSIS
Refueling Tank Level - Low	Containment Sump Recirc	SBLOCA	1. Automatic RAS a. RWT Level (low) 2. Manual RAS
		LBLOCA	1. Automatic RAS a. RWT Level (low) 2. Manual RAS
		MSLB inside containment	1. Automatic RAS a. RWT Level (low) 2. Manual RAS
SG Level (2A/2B) - Low	Aux Feedwater Initiation	MSLB	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation
		SBO	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation
		LOOP	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation
		Inadvertent Opening of SG Relief or MSSV	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation
		Excess Steam Load	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation
		Feedwater Pipe Rupture	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation
		Loss of Normal Feedwater	1. Automatic AFW Initiation a. SG Level (low) 2. Manual AFW Initiation

Table 4 - Unit 2 ESFS Instrumentation Diversity			
ESFS Instrument	**Safety Feature**	**Accident Condition**	**Diverse Protection**
SG2A - SG2B Differential Pressure - High	Aux Feedwater Isolation	MSLB inside containment	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
		MSLB outside containment	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
		SGTR	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
		Inadv Opening of SG Relief or Safety Valve	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
		Inadv Closure of MSIV	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
Feedwater Header 2A - 2B Differential Pressure	Aux Feedwater Isolation	MSLB inside containment	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
		MSLB outside containment	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
		SGTR	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation

Table 4 - Unit 2 ESFS Instrumentation Diversity			
ESFS Instrument	**Safety Feature**	**Accident Condition**	**Diverse Protection**
		Inadv Opening of SG Relief or Safety Valve	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
		Loss of Normal Feedwater	1. Automatic AFW Isolation a. Feedwater Header Diff Pressure (high) b. SG Diff Pressure (high) 2. Manual AFW Isolation
4.16kv Emer Bus Loss of Voltage	Load Shed & EDG Start	SBO	1. Automatic Load Shed & EDG Start a. 4.16kV Emerg Bus Degraded Voltage b .480V Emerg Bus Degraded Voltage c. 4.16kV Emerg Bus Loss of Voltage d. 480V Emerg Bus Loss of Voltage 2. Manual Load Shed & EDG Start 3. SBO Cross-tie to Unit 1
		LOOP	1. Automatic Load Shed & EDG Start a. 4.16kV Emerg Bus Degraded Voltage b. 480V Emerg Bus Degraded Voltage c. 4.16kV Emerg Bus Loss of Voltage d. 480V Emerg Bus Loss of Voltage 2. Manual Load Shed & EDG Start 3. SBO Cross-tie to Unit 1
480V Emer Bus Loss of Voltage	Load Shed & EDG Start	SBO	1. Automatic Load Shed & EDG Start a. 4.16kV Emerg Bus Degraded Voltage b. 480V Emerg Bus Degraded Voltage c. 4.16kV Emerg Bus Loss of Voltage d. 480V Emerg Bus Loss of Voltage 2. Manual Load Shed & EDG Start 3. SBO Cross-tie to Unit 1

Table 4 - Unit 2 ESFS Instrumentation Diversity			
ESFS Instrument	**Safety Feature**	**Accident Condition**	**Diverse Protection**
		LOOP	1. Automatic Load Shed & EDG Start a. 4.16kV Emerg Bus Degraded Voltage b. 480V Emerg Bus Degraded Voltage c. 4.16kV Emerg Bus Loss of Voltage d. 480V Emerg Bus Loss of Voltage 2. Manual Load Shed & EDG Start 3. SBO Cross-tie to Unit 1
4.16kv Emer Bus Degraded Voltage	Load Shed & EDG Start	SBO	1. Automatic Load Shed & EDG Start a. 4.16kV Emerg Bus Degraded Voltage b. 480V Emerg Bus Degraded Voltage c. 4.16kV Emerg Bus Loss of Voltage d. 480V Emerg Bus Loss of Voltage 2. Manual Load Shed & EDG Start 3. SBO Cross-tie to Unit 1
		LOOP	1. Automatic Load Shed & EDG Start a. 4.16kV Emerg Bus Degraded Voltage b. 480V Emerg Bus Degraded Voltage c. 4.16kV Emerg Bus Loss of Voltage d. 480V Emerg Bus Loss of Voltage 2. Manual Load Shed & EDG Start 3. SBO Cross-tie to Unit 1
480V Emer Bus Degraded Voltage	Load Shed & EDG Start	SBO	1. Automatic Load Shed & EDG Start a. 4.16kV Emerg Bus Degraded Voltage b. 480V Emerg Bus Degraded Voltage c. 4.16kV Emerg Bus Loss of Voltage d. 480V Emerg Bus Loss of Voltage 2. Manual Load Shed & EDG Start 3. SBO Cross-tie to Unit 1

Table 4 - Unit 2 ESFS Instrumentation Diversity			
ESFS Instrument	**Safety Feature**	**Accident Condition**	**Diverse Protection**
		LOOP	1. Automatic Load Shed & EDG Start a. 4.16kV Emerg Bus Degraded Voltage b. 480V Emerg Bus Degraded Voltage c. 4.16kV Emerg Bus Loss of Voltage d. 480V Emerg Bus Loss of Voltage 2. Manual Load Shed & EDG Start 3. SBO Cross-tie to Unit 1

ATTACHMENT 1

St. Lucie Unit 1
Markup of the Technical Specifications

PLANT SYSTEMS

MAIN STEAM LINE ISOLATION VALVES

LIMITING CONDITION FOR OPERATION

3.7.1.5 Each main steam line isolation valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

MODE 1 - With one main steam line isolation valve inoperable, POWER OPERATION may continue provided the inoperable valve is either restored to OPERABLE status or closed within 4 hours; otherwise, be in ~~HOT STANDBY~~ within the next 6 hours.

MODE 2

MODES 2 and 3 - ~~With one or both main steam isolation valve(s) inoperable, subsequent operation in MODES 2 or 3 may proceed provided the isolation valve(s) is (are) maintained closed. Otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 24 hours.~~

SURVEILLANCE REQUIREMENTS

4.7.1.5 Each main steam line isolation valve that is open shall be demonstrated OPERABLE by verifying full closure within 6.0 seconds when tested pursuant to the INSERVICE TESTING PROGRAM.

With one or both main steam isolation valve(s) inoperable, subsequent operation in MODES 2 or 3 may continue provided:

.

1. The inoperable main steam isolation valves are closed within 8 hours, and
2. The inoperable main steam isolation valves are verified closed once per 7 days.

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Otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 24 hours.

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and

b. Two separate and independent diesel generator sets each with:

1. Engine-mounted fuel tanks containing a minimum of 152 gallons of fuel,

2. A separate fuel storage system containing a minimum of 19,000 gallons of fuel, and

3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

INSERT 1

a. With one offsite circuit of 3.8.1.1.a inoperable, except as provided in Action f. below, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. Restore the offsite circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

b. With one diesel generator of 3.8.1.1.b inoperable, demonstrate the OPERABILITY of the A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and if the EDG became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE EDG by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours, unless it can be confirmed that the cause of the inoperable EDG does not exist on the remaining EDG*; restore the diesel generator to OPERABLE status within 14 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. Additionally, within 4 hours from the discovery of concurrent inoperability of required redundant feature(s) (including the steam driven auxiliary feed pump in MODE 1, 2, and 3), declare required feature(s) supported by the inoperable EDG inoperable if its redundant required feature(s) is inoperable.

INSERT 1

NOTE

* If the absence of any common-cause failure cannot be confirmed, ~~this test~~ Surveillance Requirement 4.8.1.1.2.a.4 shall be completed regardless of when the inoperable EDG is restored to OPERABILITY.

ELECTRICAL POWER SYSTEMS

ACTION (continued)

c. With one offsite A.C. circuit and one diesel generator inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter; and if the EDG became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE EDG by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours unless it can be confirmed that the cause of the inoperable EDG does not exist on the remaining EDG*. Restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. Restore the other A.C. power source (offsite circuit or diesel generator) to OPERABLE status in accordance with the provisions of Section 3.8.1.1 ACTION Statement a or b, as appropriate, with the time requirement of that ACTION Statement based on the time of the initial loss of the remaining inoperable A.C. power source. Additionally, within 4 hours from the discovery of concurrent inoperability of required redundant feature(s) (including the steam driven auxiliary feed pump in MODE 1, 2, and 3), declare required feature(s) supported by the inoperable EDG inoperable if its redundant required feature(s) is inoperable.

INSERT 1

INSERT 1

d. With two of the required offsite A.C. circuits inoperable, restore one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. Following restoration of one offsite source, follow ACTION Statement a. with the time requirement of that ACTION Statement based on the time of the initial loss of the remaining inoperable offsite A.C. circuit.

*

NOTE

If the absence of any common-cause failure cannot be confirmed, ~~this test~~ Surveillance Requirement 4.8.1.1.2.a.4 shall be completed regardless of when the inoperable EDG is restored to OPERABILITY.

ATTACHMENT 2

St. Lucie Unit 2
Markup of the Technical Specifications

PLANT SYSTEMS

MAIN STEAM LINE ISOLATION VALVES

LIMITING CONDITION FOR OPERATION

3.7.1.5 Each main steam line isolation valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

MODE 2

MODE 1 - With one main steam line isolation valve inoperable but open, POWER OPERATION may continue provided the inoperable valve is restored to OPERABLE status within 4 hours; otherwise, be in at least ~~HOT STANDBY~~ within the next 6 hours.

MODES 2, 3 and 4 - ~~With one or both main steam isolation valve(s) inoperable, subsequent operation in MODES 2, 3 or 4 may proceed provided the isolation valve(s) is (are) maintained closed. Otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 24 hours~~.

SURVEILLANCE REQUIREMENTS

4.7.1.5 Each main steam line isolation valve shall be demonstrated OPERABLE by verifying full closure within 6.75 seconds when tested pursuant to the INSERVICE TESTING PROGRAM.

With one or both main steam isolation valve(s) inoperable, subsequent operation in MODES 2, 3, or 4 may proceed provided:

.

1. The inoperable main steam isolation valves are closed within 8 hours, and
2. The inoperable main steam isolation valves are verified closed once per 7 days.

.

Otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 24 hours.

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and

b. Two separate and independent diesel generators, each with:

1. Two separate engine-mounted fuel tanks containing a minimum volume of 238 gallons of fuel each,

2. A separate fuel storage system containing a minimum volume of 42,500 gallons of fuel, and

3. A separate fuel transfer pump.

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

ACTION:

a. With one offsite circuit of 3.8.1.1.a inoperable, except as provided in Action f. below, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. Restore the offsite circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

INSERT 1

b. With one diesel generator of 3.8.1.1.b inoperable, demonstrate the OPERABILITY of the A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and if the EDG became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE EDG by performing Surveillance Requirement 4.8.1.1.2a.4 within 8 hours, unless it can be confirmed that the cause of the inoperable EDG does not exist on the remaining EDG*; restore the diesel generator to OPERABLE status within 14 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. Additionally, within 4 hours from the discovery of concurrent inoperability of required redundant feature(s) (including the steam driven auxiliary feed pump in MODE 1, 2, and 3), declare required feature(s) supported by the inoperable EDG inoperable if its redundant required feature(s) is inoperable.

* NOTE
If the absence of any common-cause failure cannot be confirmed, ~~this test~~ Surveillance Requirement 4.8.1.1.2a.4 shall be completed regardless of when the inoperable EDG is restored to OPERABILITY.

ELECTRICAL POWER SYSTEMS

ACTION: (Continued)

c. With one offsite A.C. circuit and one diesel generator inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter; and if the EDG became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE EDG by performing Surveillance Requirement 4.8.1.1.2a.4 within 8 hours, unless it can be confirmed that the cause of the inoperable EDG does not exist on the remaining EDG*. Restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. Restore the other A.C. power source (offsite circuit or diesel generator) to OPERABLE status in accordance with the provisions of Section 3.8.1.1 ACTION Statement a or b, as appropriate, with the time requirement of that ACTION Statement based on the time of the initial loss of the remaining inoperable A.C. power source. Additionally, within 4 hours from the discovery of concurrent inoperability of required redundant feature(s) (including the steam driven auxiliary feed pump in MODE 1, 2, and 3), declare required feature(s) supported by the inoperable EDG inoperable if its redundant required feature(s) is inoperable.

INSERT 1

NOTE

* If the absence of any common-cause failure cannot be confirmed, ~~this test~~ Surveillance Requirement 4.8.1.1.2a.4 shall be completed regardless of when the inoperable EDG is restored to OPERABILITY.