Entergy Nuclear Northeast
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**Lawrence Coyle**
Site Vice President

NL-15-081

June 25, 2015

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
11545 Rockville Pike, TWFN-2F1
Rockville, MD 20852-2738

SUBJECT: Additional Information Regarding Entergy's Expedited Seismic Evaluation Process Report (CEUS Sites), Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident
Indian Point Unit Number 3
Docket No. 50-286
License No. DPR-64

REFERENCES: 1. Entergy Letter (NL-14-152) to NRC regarding "Entergy's Expedited Seismic Evaluation Process Report (CEUS Sites), Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident", dated December 22, 2014

Dear Sir / Madam:

On December 22, 2014, Entergy issued Reference 1 in response to the Nuclear Regulatory Commission (NRC) request for each Licensee located in the Central and Eastern United States (CEUS) to submit a Seismic Hazard Evaluation and Screening Report. The purpose of this letter is to update the Seismic Hazard Evaluation and Screening Report (enclosure) to address commitments made for Indian Point 3 (IP3) in Reference 1 as follows:

- Entergy will perform seismic walkdowns at IP3 for inaccessible items listed in Section 7.1. Status – Complete as discussed in the enclosure, Section 7.1

- Entergy will generate HCLPF calculations for IP3 inaccessible items listed in Section 7.1. Status – Complete with HCLPF screening (identified by note 3) in Appendix B of the enclosure.

- Entergy will implement any necessary IP3 modifications for inaccessible items listed in Section 7.1 based on the schedule commitment to complete this activity in NL-13-069 dated April 29, 2013 - Complete with no new modifications required per calculations in Appendix B.

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NRR

dated April 29, 2013 - Complete with no new modifications required per calculations in Appendix B.

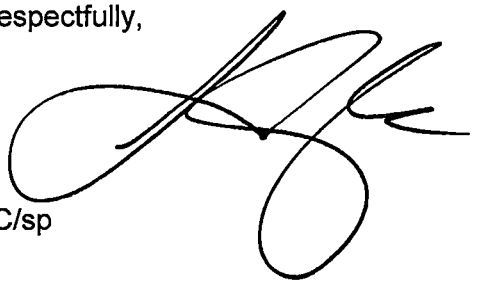
- Entergy will modify the IP3 Fire Water Storage Tanks (FWSTs) 31 and 32 and anchorages so that HCLPF>RLGM on the schedule commitment to complete this activity in NL-13-069 dated April 29, 2013 – In process and on schedule.

- Entergy will submit a letter to NRC summarizing the IP3 HCLPF results and confirming implementation of the plant modifications associated with the IP3 commitments to complete modifications for inaccessible items and modifications of the FWSTs 31 and 32 - In process with this letter closing all commitments except for FWSTs 31 and 32. A letter will be issued when they are complete in accordance with this commitment.

This letter contains no new regulatory commitments. If you have any questions regarding this report, please contact Mr. Robert Walpole, Manager, Regulatory Assurance at (914) 254-6710.

I declare under penalty of perjury that the foregoing is true and correct. Executed on June 25, 2015

Respectfully,



LC/sp

Enclosure: Expedited Seismic Evaluation Process Report for Indian Point Unit 3 – 51-9230673-002

Attachment: List of Regulatory Commitments

cc: Mr. Douglas Pickett, Senior Project Manager, NRC NRR DORL
Mr. John Boska, Senior Project Manager, NRC NRR DJLL
Mr. Daniel H. Dorman, Regional Administrator, NRC Region 1
NRC Resident Inspector
Mr. John B. Rhodes, President and CEO, NYSERDA
Ms. Bridget Frymire, New York State Dept. of Public Service

ENCLOSURE TO NL-15-081

# EXPEDITED SEISMIC EVALUATION PROCESS

# REPORT FOR INDIAN POINT UNIT 3

# -51-9230673-002

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 3
DOCKET NO. 50-286

Engineering Report No. IP-RPT-14-00038 Rev 1
Page 1 of 65

Entergy

**ENTERGY NUCLEAR**
**Engineering Report Cover Sheet**

**Engineering Report Title:**
Expedited Seismic Evaluation Process (ESEP) Report for Indian Point Unit 3

**Engineering Report Type:**

New ☐ Revision ☒ Cancelled ☐ Superseded ☐
Superseded by: _____

**Applicable Site(s)**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IP1 | ☐ | IP2 | ☐ | IP3 | ☒ | JAF | ☐ | PNPS | ☐ | VY | ☐ | WPO | ☐ |
| ANO1 | ☐ | ANO2 | ☐ | ECH | ☐ | GGNS | ☐ | RBS | ☐ | WF3 | ☐ | PLP | ☐ |

EC No. 58094

**Report Origin:** ☐ Entergy ☒ Vendor
Vendor Document No.: 51-9230673-002

**Quality-Related:** ☐ Yes ☒ No

Prepared by: Areva — Date: 6/1/15
Responsible Engineer (Print Name/Sign)

Design Verified: N/A — Date: _____
Design Verifier (if required) (Print Name/Sign)

Reviewed by: Frank Madero/ Frank Madero — Date: 6/25/15
Reviewer (Print Name/Sign)

Approved by: Richard Drake/ Richard G. Drake — Date: 6/25/15
Supervisor / Manager (Print Name/Sign)

AREVA

# AREVA Inc.

## Engineering Information Record

**Document No.:** 51 - 9230673 - 002

## Expedited Seismic Evaluation Process (ESEP) Report for Indian Point Unit 3

Safety Related? ☐ YES ☒ NO

Does this document establish design or technical requirements? ☐ YES ☒ NO

Does this document contain assumptions requiring verification? ☐ YES ☒ NO

Does this document contain Customer Required Format? ☒ YES ☐ NO

## Signature Block

| Name and Title/Discipline | Signature | P/LP, R/LR, A-CRF, A | Date | Pages/Sections Prepared/Reviewed/ Approved or Comments |
|---|---|---|---|---|
| Bijan Mahnoori<br>Project Engineer II | Bijan Mahnoori | P | 5/29/15 | All Revision 002, see Record of Revision for details. |
| Mark Stewart<br>Principal Engineer | MS | R | 5-29-15 | All Revision 002, see Record of Revision for details. |
| Kevin Connell<br>Engineering Manager | KC | A | 6/1/15 | All Revision 002, see Record of Revision for details. |

Note: P/LP designates Preparer (P), Lead Preparer (LP)
R/LR designates Reviewer (R), Lead Reviewer (LR)
A-CRF designates Project Manager Approver of Customer Required Format (A-CRF)
A designates Approver/RTM – Verification of Reviewer Independence

## Project Manager Approval of Customer References (N/A if not applicable)

| Name (printed or typed) | Title (printed or typed) | Signature | Date |
|---|---|---|---|
| Mike Terrell | Project Manager | MT | 6/3/15 |

## Record of Revision

| Revision No. | Pages/Sections/ Paragraphs Changed | Brief Description / Change Authorization |
|---|---|---|
| 000 | All | Initial release |
| 001 | Section 2.0<br><br>Appendix A – Section 2.0, 3.0, 3.1, 3.1.3, 4.2, 5.1, 6.0, 6.1, 6.2, 6.3.3, 6.4, 6.5, 7.1, 7.2, 8.1, 8.2, 8.3, 8.4, 9.0, Attachment A, and Attachment B | Section 2.0<br>• References were added due to additional components based on new revision of supporting document.<br>Appendix A<br>• Section 2.0, 3.0, 3.1, 3.1.3, 4.2, 5.1, 6.0, 6.1, 6.2, 6.3.3, 6.4, 6.5, 7.1, 7.2, 8.1, 8.2, 8.3, and 8.4 were modified to incorporate Entergy Comments [84] on Revision 0 of the document and updated with additional components based on new revision of supporting document.<br>• Attachment A - modified to incorporate Entergy Comments [84] and to update with additional components based on new revision of supporting document.<br>• Attachment B – modified to incorporate Entergy Comments [84] and to update with additional components based on new revision of supporting document. |
| 002 | Section 2.0<br><br>Appendix A – Section 5.2, 6.2, 6.3.3, 6.4, 6.6, 7.1, 7.2, 8.4, 9.0, Attachment A, and Attachment B | Section 2.0<br>• Updated the revision level for References 79a and 80.<br>• Added Reference 79h.<br>Appendix A<br>• Section 5.2 updated to address CR 2015-3376.<br>• Section 6.2 was updated to reflect the removal of a duplicate component.<br>• Section 6.3.3 & 6.4 were modified to include the components identified during the inaccessible components walkdown as requiring HCLPF evaluation.<br>• Section 6.6 was modified to address the conclusions of HCLPF evaluations to address CR 2015-3376.<br>• Section 7.1 was updated to remove a duplicate component. Also to include the information on the walkdowns of the inaccessible components that were performed during the 3R18 outage (March 2015).<br>• Section 7.2 was updated t results of inaccessible walkdowns<br>• Section 8.4 updated for results of inaccessible walkdowns<br>• Section 9.0 was modified to update the revision level for References 79a, and also added Reference 79h.<br>• Attachment A - Revised to reflect the removal of the duplicate component from the ESEL.<br>• Attachment B - Revised to reflect the the removal of the duplicate component and to include results of the walkdowns for the inaccessible components. |
| | | |

## Table of Contents

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## 1.0 DOCUMENTATION

This document contains the Expedited Seismic Evaluation Process (ESEP) Report for Indian Point Unit 3. This document is located in Appendix A and is presented in the customer requested format.

## 2.0 REFERENCES

References identified with an (*) are maintained within Indian Point Unit 3 Records System and are not retrievable from AREVA Records Management. These are acceptable references per AREVA Administrative Procedure 0402-01, Attachment 8. See page 2 for Project Manager Approval of customer references.

1. NRC (E Leeds and M Johnson) Letter to All Power Reactor Licensees et al., "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3 and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident," March 12, 2012.
2. EPRI 3002000704, "Seismic Evaluation Guidance, Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic," May 2013.
3. Entergy Letter to U.S. NRC, letter number NL-13-042 "Overall Integrated Plan in Response to March 12, 2012, Commission Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," February 28, 2013, NRC ADAMS Accession No. ML13079A348.
4. Entergy Letter to U.S. NRC, letter number NL-14-031, "Indian Point Energy Center's Second Six-Month Status Report for the Implementation of Order EA-12-049 Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," February 27, 2014, NRC ADAMS Accession No. ML14070A365.
5. Entergy Letter to U.S. NRC, letter number NL-14-110, "Indian Point Energy Center's Third Six-Month Status Report for the Implementation of Order EA-12-049 Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," August 27, 2014, NRC ADAMS Accession No. ML14251A227.
6. *Entergy Engineering Evaluation, EC No. 45874, Revision 1, "FLEX-Beyond Design Basis External Event Phases I, II, and III Strategy Development Evaluation."
7. *Entergy Drawing 9321-F-20173, Revision 72, "Flow Diagram Main Steam."
8. *Entergy System Design Description 21.2, Revision 8, "System Description 21.2, Auxiliary Feedwater System."
9. *Entergy Drawing 9321-F-70313, Revision 17, "Auxiliary Boiler Feed Pump Room Instrument Piping Sheet No.1 Instrumentation."
10. *Entergy Drawing 9321-F-27233, Revision 40, "Flow Diagram Nitrogen to Nuclear Equipment."
11. *Entergy Plant Equipment Database for IP3.
12. *Entergy Drawing 9321-F-20193, Revision 62, "Flow Diagram Boiler Feedwater."
13. *Entergy Drawing 9321-LD-72123, Sheet 9, Revision 2, "Aux. F.W. Flow to Steam Generator #31 Loop F-1200 Diagram."
14. *Entergy Drawing 9321-LD-72123, Sheet 10 Revision 2, "Aux. F.W. Flow to Steam Generator #32 Loop F-1201 Diagram."

15. *Entergy Drawing 9321-LD-72123, Sheet 11, Revision 2, "Aux. F.W. Flow to Steam Generator #33 Loop F-1202 Diagram."

16. *Entergy Drawing 9321-LD-72123, Sheet 12, Revision 2, "Aux. F.W. Flow to Steam Generator #34 Loop F-1203 Diagram."

17. *Entergy Drawing 9321-F-31673, Revision 28, "Wiring Diagram 480V Switchgear Miscellaneous."

18. *Entergy Drawing 9321-F-70033, Revision 17, "Transmitter Racks Piping Arrangement – Sheet No. 2 Instrumentation for Indian Point Energy Center Unit No. 3."

19. *Entergy System Design Description 21.1, Revision 4, "System Description 21.1, Steam Generator Water Level Control."

20. *Entergy Drawing 9321-F-70253, Revision 10, "Primary Plant Instrument Piping & Supports – Sheet No. 1 Instrumentation."

21. *Entergy Drawing 9321-H-39903 Sheet 70, Revision 5, "Rack D-9 Layout."

22. *Entergy Drawing 9321-F-32273, Revision 41, "Wiring Diagram Supervisory Control Panel SC."

23. *Entergy Drawing 9321-F-70513, Revision 17, "Transmitter Racks Piping Arrangement – Sheet No. 4 Instrumentation."

24. *Entergy Drawing 9321-F-10023, Revision 22, "Plot Plan."

25. *Entergy Drawing 9321-F-20183 Sheet 1, Revision 63, "Flow Diagram Condensate & Boiler Feed Pump Suction."

26. *Entergy Drawing 9321-F-27353, Revision 42, "Flow Diagram Safety Injection System Sheet No. 1."

27. *Entergy System Design Description 10.1, Revision 10, "System Description 10.1, Safety Injection System."

28. *Entergy System Design Description 3.0, Revision 8, "System Description 3.0, Chemical and Volume Control System."

29. *Entergy System Design Description 4.2, Revision 7, "System Description 4.2, Residual Heat Removal System."

30. *Entergy System Design Description 1.4, Revision 7, "System Description 1.4, Pressurizer & Pressurizer Relief Tank."

31. *Entergy Drawing 9321-F-33853, Revision 19, "Electrical Distribution & Transmission System."

32. *Entergy Drawing 9321-F-30063 Sheet 1, Revision 81, "Single Line Diagram 480V Motor Control Center No.'s 36A, 36B & 36C."

33. *Entergy Drawing 9321-F-27363, Revision 52, Flow Diagram Chemical & Volume Control System Sheet No. 1."

34. *Entergy Drawing 9321-F-27513 Sheet 1, Revision 31, "Flow Diagram Auxiliary Coolant System In PAB & FSB Sheet No. 1."

35. *Entergy Drawing 9321-F-27503, Revision 55, "Flow Diagram Safety Injection System Sheet No. 2."

36. *Entergy Drawing 9321-F-27203, Revision 29, "Flow Diagram Auxiliary Coolant System Inside Containment."

37. *Entergy Drawing 9321-F-27473, Revision 43, "Flow Diagram Reactor Coolant System Sheet No. 2."

38. *Entergy Drawing 9321-F-36383, Revision 4, "Miscellaneous Wiring Details RCS-SOV-652, RCS-SOV-653, RCS-SOV-654, & RCS-SOV-655."

39. *Entergy Drawing 9321-F-30053, Revision 72, "Single Line Diagram 480V Motor Control Centers 37, 38, 39, & 311."

40. *Entergy Drawing 9321-F-30083, Revision 60, "Single Line Diagram D.C. System."

41. *Entergy Drawing IP3V-0454-0041, Revision 1, Structural Detail for Seismic Category 1 Instrument Rack."

42. *Entergy Calculation IP-CALC-07-00154, Revision 0, "Containment Atmospheric Temperature."

43. *Entergy Drawing 9321-F-33433, Revision 7, "Containment Parameters System Wiring Diagram."

44. *Entergy Drawing 9321-H-39913 Sheet 8, Revision 8, "External Connection Diagram R.P.S. Rack No. 8 (A-7)."

45. *Entergy Drawing 9321-H-36723, Revision 0, "Cover Plates on Flight Pnl. "FCF" & Supervisory Pnl. "SCF" – Fabrication Mounting Details."

46. *Entergy Drawing 9321-F-20303, Revision 30, "Flow Diagram Fuel Oil to Diesel Generators."

47. *Entergy Drawing 9321-F-39893, Revision 43, "Single Line Diagram 118VAC Instrument Buses 31, 31A, 32, 32A, 33, 33A, 34, & 34A."

48. *Entergy Document IP3-RPT-UNSPEC-02182, Indian Point Three Nuclear Power Plant Individual Plant Examination of External Events," September 1997.

49. *Entergy Drawing 9321-F-32723, Revision 28, Wiring Diagram Flight Control Pnl. FCF & FCR."

50. *Entergy Drawing 9321-LD-72453 Sheet 21A, Revision 2, "Overpressurization System Channel 1 Loop P/T-413 Diagram."

51. *Entergy Drawing 9321-LD-72453 Sheet 23A, Revision 2, "Overpressurization System Channel 4 Loop P/T-443 Diagram."

52. *Entergy Drawing 9321-LD-72453 Sheet 21, Revision 3, "Overpressurization System Channel 1 Loop P/T-413 Diagram."

53. *Entergy Drawing 9321-LD-72453 Sheet 23, Revision 3, "Overpressurization System Channel 4 Loop P/T-443 Diagram."

54. *Entergy Drawing 9321-F-27383, Revision 28, "Flow Diagram Reactor Coolant System Sheet No. 1."

55. *Entergy Drawing 9321-LL-36853, Sheet 1, Revision 3, "Schematic Block Diagram Reactor Vessel Level Instrument System Train "A"."

56. *Entergy Drawing 9321-F-33203, Sheet 1, Revision 24, "Conduit & Tray Connection Schematic Containment Building."

57. *Entergy Drawing 9321-F-33313, Sheet 2, Revision 6, "Conduit & Tray Connection Schematic Fan House."

58. *Entergy Drawing 9321-F-30793, Revision 50, "Conduit Layout Containment Building Piping Penetration Area – Fan House."

59. *Entergy Drawing 9321-F-72043, Revision 7, "Containment Building Reactor Vessel Level Instrumentation System Flow Diagram."

60. *Entergy Drawing 9321-F-70283, Revision 25, Containment Building Instrument Arrangement Sheet No. 2 Instrumentation."

61. *Entergy Drawing 9321-F-39933, Revision 19 "Conduit Layout TSI Room, CFM Multiplexer Room, Control Building EL. 53'-0" & Roof El. 72'-7."

62. *Entergy Drawing 9321-F-95273 Sheet 1, Revision 6, "Control Room RVLIS Rack – Train "A" Interconnection Wiring Diagram."

63. *Entergy Procedure 3-ECA-0.0, Revision 9, "Loss of All AC Power."

64. *Entergy Drawing 9321-F-32383, Revision 31, "Wiring Diagram Supervisory Control Panel SB2."

65. *Entergy System Design Description 1.1, Revision 5, "System Description 1.1, Reactor Coolant System."

66. *Entergy Drawing IP3V-0245-0001, Revision 0, "40'-0" OD x 40'-0" High Fire Protection Water Storage Tanks "FP-Tk-1" & "FP-Tk-2" Pipe Support Details."

67. *Entergy System Design Description 18.0, Revision 7, "System Description 18.0, Main and Reheat Steam."

68. EPRI 1025287, "Seismic Evaluation Guidance: Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic. Electric Power Research Institute," February 2013.

69. Entergy Letter NL-14-043, John A. Ventosa to NRC, "Entergy Seismic Hazard and Screening Report (CEUS Sites), Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident dated March 31, 2014." NRC ADAMS Accession No. ML14099A111.

70. *"Indian Point Energy Center Unit 3 Updated Final Safety Analysis Report," Revision 5, Docket No. 50-286, 2013.

71. EPRI-NP-6041-SL, "Methodology for Assessment of Nuclear Power Plant Seismic Margin," Revision 1, August 1991.

72. EPRI TR-103959, "Methodology for Developing Seismic Fragilities," July 1994.

73. NRC NUREG-1407, "Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities," June 1991.

74. SQUG, "Generic Implementation Procedure (GIP) for Seismic Verification of Nuclear Plant Equipment, Seismic Qualification Utility Group," Revision 3A, December 2001.

75. NRC (E. Leeds) Letter to All Power Reactor Licensees et al., "Screening and Prioritization Results Regarding Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(F)

Regarding Seismic Hazard Re-Evaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights From the Fukushima Dai-Ichi Accident," May 9, 2014.

76. Nuclear Energy Institute (NEI), A. Pietrangelo, Letter to D. Skeen of the USNRC, "Seismic Core Damage Risk Estimates Using the Updated Seismic Hazards for the Operating Nuclear Plants in the Central and Eastern United States," March 12, 2014.

77. Nuclear Energy Institute (NEI), A. Pietrangelo, Letter to D. Skeen of the USNRC, "Proposed Path Forward for NTTF Recommendation 2.1: Seismic Reevaluations," April 9, 2013, NRC ADAMS Accession No. ML13101A379.

78. NRC (E Leeds) Letter to NEI (J Pollock), "Electric Power Research Institute Final Draft Report xxxxx, "Seismic Evaluation Guidance: Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic," as an Acceptable Alternative to the March 12, 2012, Information Request for Seismic Reevaluations," May 7, 2013.

79. *Entergy Document EC54071, "ESEP Reports," the following AREVA documents are captured in the plant document management system:

    a. AREVA Document 51-9212951-007, "ESEP Expedited Seismic Equipment List (ESEL) – Indian Point Unit 3."

    b. AREVA Calculation 32-9227208-000, "Indian Point Unit 3 ESEP HCLPF Calculation – Station Service Transformers 2, 3, 5, and 6."

    c. AREVA Calculation 32-9227381-000, "Indian Point Unit 3 ESEP HCLPF Calculation – Battery Bank 33 (BATT 33)."

    d. AREVA Calculation 32-9227576-000, "Indian Point Unit 3 ESEP HCLPF Calculation – Battery Chargers 31, 32, & 34."

    e. AREVA Calculation 32-9230353-000, "Indian Point Unit 3 ESEP HCLPF Calculation – Refueling Water Storage Tank, RWST-31."

    f. AREVA Calculation 32-9230692-000, "Indian Point Unit 3 ESEP HCLPF Calculation – RCS Overpressure Racks H-1 and H-3."

    g. AREVA Document 32-9232897-000, "Indian Point Unit 3 ESEP Calculation – Fire Water Storage Tanks FP-T-1 and FP-T-2."

    h. AREVA Calculation 32-9238938-000, "Indian Point Unit 3 ESEP HCLPF Calculation – Residual Heat Exchangers ACAHRS1 and ACAHRS2."

The following references are AREVA references which were used as input for Appendix A.

80. AREVA Calculation 32-9224585-003, "Indian Point Unit 3 ESEP Binning and Screening."

81. AREVA Document 51-9230419-001, "Input to Entergy ESEP Report Sections 2 and 3 for Indian Point 3."

82. AREVA Document 51-9227403-000, "Input to Entergy ESEP Report Sections 4 and 5 for Indian Point Unit 3."

83. AREVA Document 51-9230505-000, "Input to Entergy ESEP Report Sections 6, 7, and 8 for Indian Point Unit 3."

84. AREVA Document 38-9232223-000, "Indian Point Unit 3 ESEP Report Comment Resolution Form."

## APPENDIX A: EXPEDITED SEISMIC EVALUATION PROCESS (ESEP) REPORT FOR INDIAN POINT UNIT 3

**Note: Customer requested formatting begins on the following page.**

# EXPEDITED SEISMIC EVALUATION PROCESS (ESEP) REPORT FOR INDIAN POINT UNIT 3 (IP3)

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## 1.0 PURPOSE AND OBJECTIVE

Following the accident at the Fukushima Dai-ichi nuclear power plant resulting from the March 11, 2011, Great Tohoku Earthquake and subsequent tsunami, the Nuclear Regulatory Commission (NRC) established a Near-Term Task Force (NTTF) to conduct a systematic review of NRC processes and regulations and to determine if the agency should make additional improvements to its regulatory system. The NTTF developed a set of recommendations intended to clarify and strengthen the regulatory framework for protection against natural phenomena. Subsequently, the NRC issued a 50.54(f) letter on March 12, 2012 [1], requesting information to assure that these recommendations are addressed by all U.S. nuclear power plants. The 50.54(f) letter requests that licensees and holders of construction permits under 10 CFR Part 50 reevaluate the seismic hazards at their sites against present-day NRC requirements and guidance. Depending on the comparison between the reevaluated seismic hazard and the current design basis, further risk assessment may be required. Assessment approaches acceptable to the staff include a seismic probabilistic risk assessment (SPRA), or a seismic margin assessment (SMA). Based upon the assessment results, the NRC staff will determine whether additional regulatory actions are necessary.

This report describes the Expedited Seismic Evaluation Process (ESEP) undertaken for Indian Point Unit 3. The intent of the ESEP is to perform an interim action in response to the NRC's 50.54(f) letter to demonstrate seismic margin through a review of a subset of the plant equipment that can be relied upon to protect the reactor core following beyond design basis seismic events.

The ESEP is implemented using the methodologies in the NRC endorsed guidance in Electric Power Research Institute (EPRI) 3002000704, Seismic Evaluation Guidance: Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic [2].

The objective of this report is to provide summary information describing the ESEP evaluations and results. The level of detail provided in the report is intended to enable the NRC to understand the inputs used, the evaluations performed, and the decisions made as a result of the interim evaluations.

## 2.0 BRIEF SUMMARY OF THE FLEX SEISMIC IMPLEMENTATION STRATEGIES

The Indian Point Unit 3 FLEX strategies for Reactor Core Cooling and Heat Removal, Reactor Inventory Control/Long Term Subcriticality, and Containment Function are summarized below. This summary is derived from the Indian Point Energy Center Overall Integrated Plan (OIP) in Response to the March 12, 2012, Commission Order EA-12-049 [3], and is consistent with the second and third six-month status reports [4][5] and supplemented by supporting FLEX engineering calculations [6].

### Core Cooling and Heat Removal

The Phase 1 FLEX strategy at Indian Point Unit 3 for this function is to use Atmospheric Dump Valves (ADVs) and Main Steam Safety Valves (MSSVs) to remove heat, with the steam generator being fed by the turbine-driven Auxiliary Feedwater (AFW) pump. Suction for the AFW pump is from the Condensate Storage Tank (CST). Backup nitrogen cylinders are available to support cycling the ADVs.

During Phase 2 of the FLEX strategy, portable diesel-driven pumps will be staged to provide makeup to the CST or to the steam generator feedwater pump suction. The diesel-driven steam generator FLEX feed pump will be staged to provide feedwater to steam generators in the event that the turbine-driven AFW pump becomes unavailable. The Primary Water Storage Tank (PWST) or Fire Water Storage Tanks (FWSTs) will be used as makeup sources to the CST. Diesel fuel for FLEX equipment can be provided from existing onsite Emergency Diesel Generator (EDG) Fuel Oil Storage Tanks.

The key parameters to be monitored are: steam generator level, steam generator pressure, CST level, Reactor Coolant System (RCS) pressure, and RCS temperature.

**RCS Inventory Control**

*For At Power modes*

In Phase 1, plant cooldown and depressurization will occur. Inventory control is achieved via the accumulators.

During Phase 2, to avoid adverse effects on the RCS natural circulation flow, the cold-leg accumulator isolation valves are electrically closed during the cooldown to prevent nitrogen injection into the RCS. A FLEX pump will be used to provide RCS makeup with borated water supplied by the Refueling Water Storage Tank (RWST). To allow borated water injection into the RCS, the reactor head vent can be opened, if necessary, to provide a letdown path.

If the Extended Loss of AC Power (ELAP) event occurs during cold weather months when freezing of the RWST could possibly occur, a FLEX diesel generator can be used to repower the Electric Heat Trace (EHT) system.

*For Shutdown modes*

In Phase 1, if the refueling canal is full, RCS makeup will be supplied by gravity feed from the RWST.

During Phase 2, a FLEX pump will be used to provide RCS makeup from the RWST in the same manner as for the At Power modes.

Additional key parameters to be monitored are pressurizer level and reactor vessel level and nuclear instrumentation.

**Containment Function**

Containment function is not expected to be challenged during Phase 1 or Phase 2 for an ELAP event occurring when the plant is in Mode 1-4. Therefore, no FLEX strategy beyond monitoring containment pressure and temperature was developed to support containment function.

For Modes 5 and 6, containment pressure could be challenged unless a vent path is established. Methods to establish a vent path will be used and include: opening penetration UU, which is used during outages as an additional air supply, deflating the sealing ring of the equipment hatch (if installed), or another vent path identified and evaluated.

**Supporting Systems**

Necessary electrical components are outlined in the Indian Point Unit 3 OIP and primarily entail station batteries, Direct Current (DC) buses, distribution panels, inverters, battery chargers, and instrument buses.

## 3.0 EQUIPMENT SELECTION PROCESS AND ESEL

The selection of equipment for the Expedited Seismic Equipment List (ESEL) followed the guidelines of EPRI 3002000704 [2]. The ESEL for Indian Point Unit 3 is presented in Attachment A. Information presented in Attachment A is drawn from the following references [3], [4], [5], [6], [7], [8], [9], [10], [11], [12], [13], [14], [15], [16], [17], [18], [19], [20], [21], [22], [23], [24], [25], [26], [27], [28], [29], [30], [31], [32], [33], [34], [35], [36], [37], [38], [39], [40], [41], [42], [43], [44], [45], [46], [47], [48], [49], [50], [51], [52], [53], [54], [55], [56], [57], [58], [59], [60], [61], [62], [63], [64], [65], [66], and [67].

### 3.1 Equipment Selection Process and ESEL

The selection of equipment to be included on the ESEL was based on installed plant equipment credited in the FLEX strategies during Phase 1, 2 and 3 mitigation of a Beyond Design Basis External Event (BDBEE), as outlined in the Indian Point Unit 3 OIP in Response to the March 12, 2012, Commission Order EA-12-049 [3] and is consistent with the second and third six-month status report issued to the NRC [4][5]. The OIP provides the Indian Point Unit 3 FLEX mitigation strategy and serves as the basis for equipment selected for the ESEP.

The scope of "installed plant equipment" includes equipment relied upon for the FLEX strategies to sustain the critical functions of core cooling and containment integrity consistent with the Indian Point Unit 3 OIP. FLEX recovery actions are excluded from the ESEP scope per EPRI 3002000704 [2]. The overall list of planned FLEX modifications and the scope for consideration herein is limited to those required to support core cooling, reactor coolant inventory and subcriticality, and containment integrity functions. Portable and pre-staged FLEX equipment (not permanently installed) are excluded from the ESEL per EPRI 3002000704.

The ESEL component selection followed the EPRI guidance outlined in Section 3.2 of EPRI 3002000704.

1. The scope of components is limited to that required to accomplish the core cooling and containment safety functions identified in Table 3-2 of EPRI 3002000704. The instrumentation monitoring requirements for core cooling/containment safety functions are limited to those outlined in the EPRI 3002000704 guidance, and are a subset of those outlined in the Indian Point Unit 3 OIP.
2. The scope of components is limited to installed plant equipment, and FLEX connections necessary to implement the Indian Point Unit 3 OIP as described in Section 2 of this report.
3. The scope of components assumes the credited FLEX connection modifications are implemented, and are limited to those required to support a single FLEX success path (i.e., either "Primary" or "Back-up/Alternate").
4. The "Primary" FLEX success path is to be specified. Selection of the "Back-up/Alternate" FLEX success path must be justified.
5. Phase 3 coping strategies are included in the ESEP scope, whereas recovery strategies are excluded.
6. Structures, systems, and components excluded per the EPRI 3002000704 [2] guidance are:
   - Structures (e.g. containment, reactor building, control building, auxiliary building, etc.).
   - Piping, cabling, conduit, HVAC, and their supports.
   - Manual valves and rupture disks.
   - Power-operated valves not required to change state as part of the FLEX mitigation strategies.
   - Nuclear steam supply system components (e.g. RPV and internals, reactor coolant pumps and seals, etc.).
7. For cases in which neither train was specified as a primary or back-up strategy, then only one train component (generally 'A' train) is included in the ESEL.

### 3.1.1 ESEL Development

The ESEL was developed by reviewing the Indian Point OIP [3], second and third six-month status reports [4][5] to determine the major equipment involved in the FLEX strategies. Further reviews of plant drawings (e.g., Piping and Instrumentation Diagrams (P&IDs) and Electrical One Line Diagrams) were performed to identify the boundaries of the flow paths to be used in the FLEX strategies and to identify specific components in the flow paths needed to support implementation of the FLEX strategies. Boundaries were established at an electrical or mechanical isolation device (e.g., isolation amplifier, valve, etc.) in branch circuits / branch lines off the defined strategy electrical or fluid flow path. P&IDs were the primary reference documents used to identify mechanical components and instrumentation. The flow paths used for FLEX strategies were selected and specific components were identified using detailed equipment and instrument drawings, piping isometrics, electrical schematics and one-line drawings, system descriptions, design basis documents, as necessary.

Cabinets and equipment controls containing relays, contactors, switches, potentiometers, circuit breakers and other electrical and instrumentation that could be affected by high-frequency earthquake motions and that impact the operation of equipment in the ESEL are required to be on the ESEL. These cabinets and components were identified in the ESEL.

For each parameter monitored during the FLEX implementation, a single indication was selected for inclusion in the ESEL. For each parameter indication, the components along the flow path from measurement to indication were included, since any failure along the path would lead to failure of that indication. Components such as flow elements were considered as part of the piping and were not included in the ESEL.

### 3.1.2 Power Operated Valves

Page 3-3 of EPRI 3002000704 [2] notes that power operated valves not required to change state as part of the FLEX mitigation strategies are excluded from the ESEL. Page 3-2 also notes that "functional failure modes of electrical and mechanical portions of the installed Phase 1 equipment should be considered (e.g. AFW trips)." To address this concern, the following guidance is applied in the Indian Point Unit 3 ESEL for functional failure modes associated with power operated valves:

- Power operated valves that remain energized during the ELAP events (such as DC powered valves), were included on the ESEL.
- Power operated valves not required to change state as part of the FLEX mitigation strategies were not included on the ESEL. The seismic event also causes the ELAP event; therefore, the valves are incapable of spurious operation as they would be de-energized.
- Power operated valves not required to change state as part of the FLEX mitigation strategies during Phase 1, and are re-energized and operated during subsequent Phase 2 and 3 strategies, were not evaluated for spurious valve operation as the seismic event that caused the ELAP has passed before the valves are re-powered.

### 3.1.3 Pull Boxes

Pull boxes were deemed unnecessary to be added to the ESEL as these components provide completely passive locations for pulling or installing cables. No breaks or connections in the cabling were included in pull boxes. Pull boxes were considered part of conduit and cabling, which were excluded in accordance with EPRI 3002000704 [2].

### 3.1.4 Termination Cabinets

Termination cabinets, including cabinets necessary for FLEX Phase 2 and Phase 3 connections, provide consolidated locations for permanently connecting multiple cables. The termination cabinets and the internal connections provide a completely passive function; however, the cabinets are included in the ESEL to ensure industry knowledge on panel/anchorage failure vulnerabilities is addressed.

### 3.1.5 Critical Instrumentation Indicators

Critical indicators and recorders are typically physically located on panels/cabinets and are included as separate components; however, seismic evaluation of the instrument indication may be included in the panel/cabinet seismic evaluation (rule-of-the-box).

### 3.1.6 Phase 2 and 3 Piping Connections

Item 2 in Section 3.1 above notes that the scope of equipment in the ESEL includes "... FLEX connections necessary to implement the Indian Point Unit 3 OIP as described in Section 2." Item 3 in Section 3.1 also notes that "The scope of components assumes the credited FLEX connection modifications are implemented, and are limited to those required to support a single FLEX success path (i.e., either "Primary" or "Back-up/Alternate")."

Item 6 in Section 3.1 above goes on to explain that "Piping, cabling, conduit, HVAC, and their supports" are excluded from the ESEL scope in accordance with EPRI 3002000704 [2].

Therefore, piping and pipe supports associated with FLEX Phase 2 and Phase 3 connections are excluded from the scope of the ESEP evaluation. However, any active valves in FLEX Phase 2 and Phase 3 connection flow path are included in the ESEL.

## 3.2 Justification for Use of Equipment That is Not the Primary Means for FLEX Implementation

No equipment that was not part of the primary success path was selected for the Indian Point Unit 3 ESEL.

# 4.0 GROUND MOTION RESPONSE SPECTRUM (GMRS)

## 4.1 Plot of GMRS Submitted by the Licensee

In accordance with the guidance provided in Section 2.4.2 of the SPID [68] for rock sites, the Safe Shutdown Earthquake (SSE) control point elevation is defined at the top of hard-rock and is applicable at grade in the free field as well as the various foundations elevations [69]. Table 4-1 shows the GMRS acceleration for a range of spectral frequencies [69]. The GMRS at the control point is shown in Figure 4-1.

**Table 4-1: GMRS for Indian Point Unit 3**

| Frequency (Hz) | GMRS (g) |
|---|---|
| 100 | 4.12E-01 |
| 90 | 4.46E-01 |
| 80 | 5.04E-01 |
| 70 | 5.94E-01 |
| 60 | 7.04E-01 |
| 50 | 8.06E-01 |
| 45 | 8.42E-01 |
| 40 | 8.66E-01 |
| 35 | 8.77E-01 |
| 30 | 8.75E-01 |
| 25 | 8.58E-01 |
| 20 | 8.28E-01 |
| 15 | 7.67E-01 |
| 12.5 | 7.17E-01 |
| 10 | 6.48E-01 |
| 9 | 6.04E-01 |
| 8 | 5.55E-01 |
| 7 | 5.02E-01 |
| 6 | 4.46E-01 |
| 5 | 3.85E-01 |
| 4 | 3.14E-01 |
| 3 | 2.36E-01 |
| 2.5 | 1.94E-01 |
| 2 | 1.59E-01 |
| 1.5 | 1.17E-01 |
| 1.25 | 9.42E-02 |
| 1 | 7.04E-02 |
| 0.9 | 6.40E-02 |
| 0.8 | 5.71E-02 |
| 0.7 | 4.99E-02 |
| 0.6 | 4.25E-02 |
| 0.5 | 3.48E-02 |

**Table 4-1: GMRS for Indian Point Unit 3 (continued)**

| Frequency (Hz) | GMRS (g) |
|---|---|
| 0.4 | 2.78E-02 |
| 0.3 | 2.09E-02 |
| 0.2 | 1.39E-02 |
| 0.167 | 1.16E-02 |
| 0.125 | 8.69E-03 |
| 0.1 | 6.95E-03 |

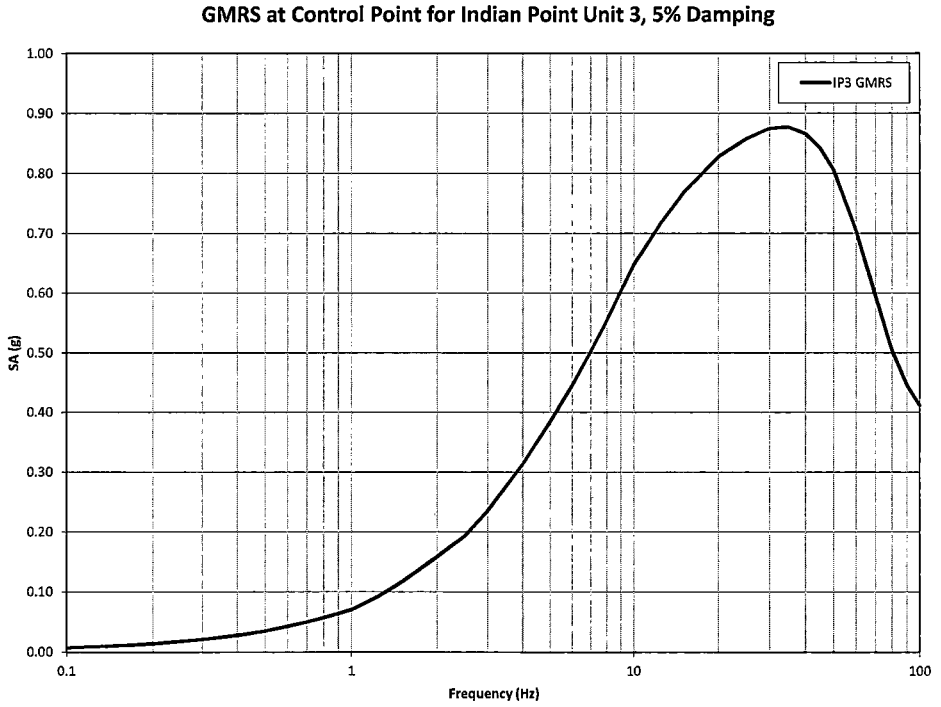


**Figure 4-1: GMRS for Indian Point Unit 3**

## 4.2 Comparison to SSE

The SSE corresponds to a horizontal acceleration of 0.15g [70]. The SSE is defined in the Updated Final Safety Analysis Report [70] in terms of a Peak Ground Acceleration (PGA) and a design response spectrum. These spectra have been digitized and tabulated [69]. Table 4-2 shows the spectral acceleration values at selected frequencies for the 5% damped horizontal SSE.

**Table 4-2: SSE for Indian Point Unit 3**

| Frequency (Hz) | Spectral Acceleration (g) |
|---|---|
| 100 | 0.15 |
| 25 | 0.15 |
| 10 | 0.168 |
| 5 | 0.228 |
| 2.5 | 0.234 |
| 1 | 0.127 |
| 0.5 | 0.075 |

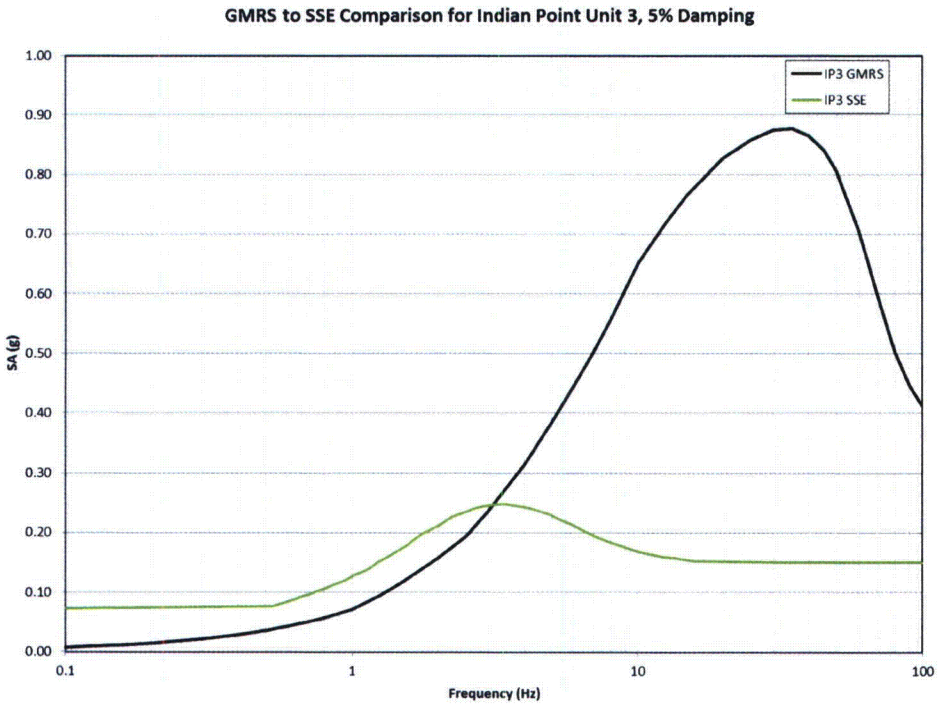


**Figure 4-2: GMRS to SSE Comparison for Indian Point Unit 3**

The SSE envelops the GMRS for lower frequencies up to nearly 3 Hz. The GMRS exceeds the SSE beyond that point. As the GMRS exceeds the SSE in the 1 to 10 Hz range, the plant does not screen out of the ESEP according to Section 2.2 of EPRI 3002000704 [2]. The two special screening considerations as described in Section 2.2.1 of EPRI 3002000704, namely a) Low-frequency GMRS exceedances at Low Seismic Hazard Sites and b) Narrow Band Exceedances in the 1 to 10Hz range, provide criteria for accepting specific GMRS exceedances. However, the GMRS exceedances occur in the frequency range of interest and cannot be characterized as narrow-band exceedances. Therefore, these special screening considerations do not apply for Indian Point Unit 3 and High Confidence of a Low Probability of Failure (HCLPF) evaluations are to be performed.

## 5.0 REVIEW LEVEL GROUND MOTION (RLGM)

### 5.1 Description of RLGM Selected

The RLGM is selected based on Approach 1 in Section 4 of EPRI 3002000704 [2]. The RLGM is developed based on the SSE. The maximum GMRS/SSE ratio between 1 and 10 Hz range occurs at 10 Hz where the ratio is 0.648/0.168 = 3.86. As the maximum ratio of the GMRS to the SSE over the 1 to 10 Hz range exceeds a value of 2, the GMRS/SSE ratio is set to the maximum scaling factor value of 2.0 for IP3 in accordance with Section 4 of EPRI 3002000704. Table 5-1 lists the horizontal ground RLGM acceleration at 5% damping at selected frequencies and the plot is shown in Figure 5-1. The RLGM is generated by plotting the digitized data on a log/linear graph paper, and connecting the points with straight lines.

**Table 5-1: RLGM for Indian Point Unit 3**

| Frequency (Hz) | RLGM at 5% Damping (g) |
|---|---|
| 100.00 | 0.30 |
| 33.00 | 0.30 |
| 15.78 | 0.31 |
| 13.65 | 0.31 |
| 12.20 | 0.32 |
| 10.09 | 0.34 |
| 8.43 | 0.36 |
| 7.23 | 0.38 |
| 6.55 | 0.40 |
| 5.89 | 0.43 |
| 5.34 | 0.44 |
| 4.94 | 0.46 |
| 4.59 | 0.47 |
| 4.17 | 0.48 |
| 3.83 | 0.49 |
| 3.67 | 0.49 |
| 3.41 | 0.50 |
| 3.15 | 0.49 |
| 2.89 | 0.49 |
| 2.65 | 0.48 |
| 2.55 | 0.47 |
| 2.24 | 0.45 |
| 2.02 | 0.42 |

**Table 5-1: RLGM for Indian Point Unit 3 (continued)**

| Frequency (Hz) | RLGM at 5% Damping (g) |
|---|---|
| 1.78 | 0.40 |
| 1.64 | 0.38 |
| 1.57 | 0.36 |
| 1.46 | 0.34 |
| 1.34 | 0.32 |
| 1.23 | 0.30 |
| 1.16 | 0.28 |
| 1.09 | 0.27 |
| 1.01 | 0.26 |
| 0.96 | 0.24 |
| 0.91 | 0.23 |
| 0.86 | 0.22 |
| 0.81 | 0.21 |
| 0.76 | 0.21 |
| 0.74 | 0.20 |
| 0.71 | 0.19 |
| 0.68 | 0.19 |
| 0.64 | 0.18 |
| 0.60 | 0.17 |
| 0.56 | 0.16 |
| 0.53 | 0.15 |
| 0.10 | 0.14 |

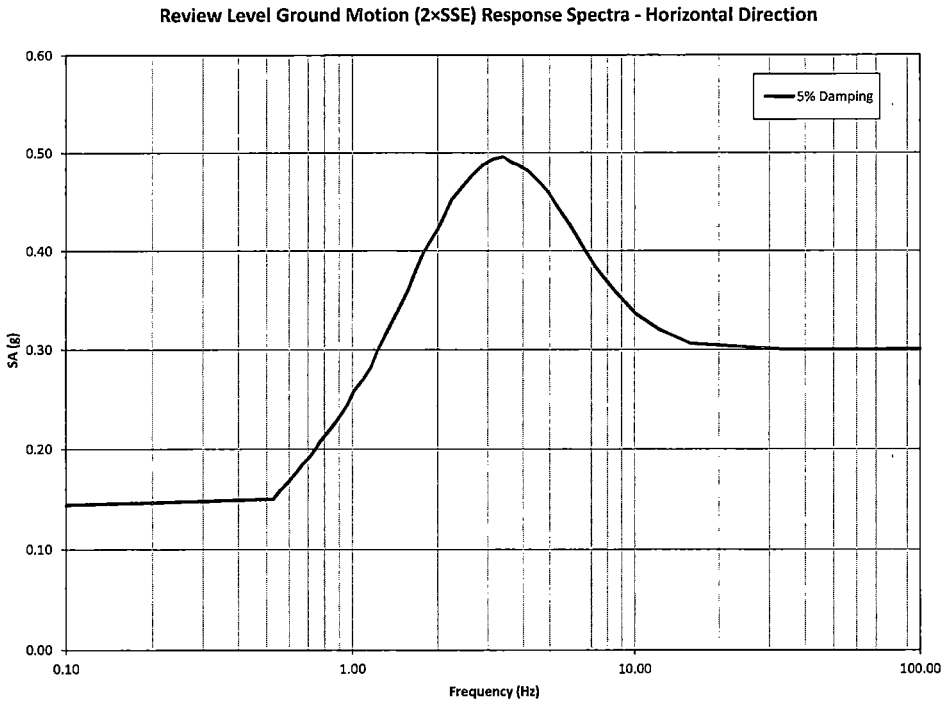


**Figure 5-1: RLGM for Indian Point Unit 3**

## 5.2 Method to Estimate In-Structure Response Spectra (ISRS)

The RLGM ISRS for Indian Point Unit 3 are generated by scaling the SSE ISRS [70]. The following steps are used to generate the RLGM ISRS.

1. Obtain the horizontal direction SSE ISRS for a particular damping value.
2. Calculate the horizontal RLGM ISRS by scaling the horizontal direction SSE ISRS by a factor of 2.0.
3. Repeat steps 1 and 2 to obtain RLGM ISRS for multiple damping values.

For each relevant floor elevation, the vertical direction RLGM ISRS is calculated as two thirds of the horizontal in-structure floor response.

# 6.0 SEISMIC MARGIN EVALUATION APPROACH

It is necessary to demonstrate that ESEL items have sufficient seismic capacity to meet or exceed the demand characterized by the RLGM. The seismic capacity is characterized as the PGA for which there is a HCLPF. The PGA is associated with a specific spectral shape, in this case the 5%-damped RLGM spectral shape. The HCLPF capacity must be equal to or greater than the RLGM PGA. The criteria for seismic capacity determination are given in Section 5 of EPRI 3002000704 [2].

There are two basic approaches for developing HCLPF capacities:

1. Deterministic approach using the conservative deterministic failure margin (CDFM) methodology of EPRI NP-6041-SL, A Methodology for Assessment of Nuclear Power Plant Seismic Margin (Revision 1) [71].

2. Probabilistic approach using the fragility analysis methodology of EPRI TR-103959, Methodology for Developing Seismic Fragilities [72].

## 6.1 Summary of Methodologies Used

Indian Point Unit 3 was classified as a 0.3g full scope plant in NUREG-1407 [73] and performed a SPRA as part of Individual Plant Examination for External Events (IPEEE) program. The SPRA is documented in [48]. Indian Point Unit 3 IPEEE program followed the NUREG-1407 methodology for seismic evaluation with plant seismic walkdowns using the EPRI NP-6041-SL [71] and Generic Implementation Procedure [74]. Walkdown efforts were coordinated for evaluations pertaining to the IPEEE and Unresolved Safety Issue (USI) A-46. Section 3.3 and Appendix B of [69] established that in accordance with the criteria established in SPID [68] Section 3.3, the IPEEE and reassessment of IHS are adequate to support screening of the updated seismic hazard for Indian Point Unit 3. Hence, the risk insights obtained from the IPEEE are used to assess risk for ESEP where applicable.

For ESEP, the evaluation consisted of screening walkdowns and HCLPF calculations. The screening walkdowns used the screening tables from Chapter 2 of EPRI NP-6041-SL. The walkdowns were conducted by engineers trained in EPRI NP-6041-SL and were documented on Screening Evaluation Work Sheets (SEWS) from EPRI NP-6041-SL. Anchorage capacity calculations used the CDFM criteria from EPRI NP-6041-SL. Seismic demand was based on EPRI 3002000704 [2] using an RLGM of 2×SSE with a PGA of 0.3g PGA as shown on Figure 5-1.

## 6.2 HCLPF Screening Process

For ESEP, the components are screened considering RLGM (2×SSE) with a 0.3g PGA. The screening tables in EPRI NP-6041-SL [71] are based on ground peak spectral accelerations of 0.8g and 1.2g. These both exceed the RLGM peak spectral acceleration.

The ESEL components were prescreened based on Table 2-4 of EPRI NP-6041-SL. Additional pre-screening, specifically for anchorage, considered walkdown results and documentation from NTTF 2.3 and SEWS from IPEEE and USI A-46. Equipment anchorage was screened out in cases where previous evaluations showed large available margin against SSE. The remaining components (i.e., components that do not screen out), were identified as requiring HCLPF calculations. ESEL components were walked down and based on the equipment and anchorage conditions, prescreening decisions were confirmed and a final list of required HCLPF calculations was generated. Equipment for which the screening caveats were met and for which the anchorage capacity exceeded the RLGM seismic demand are screened out from ESEP seismic capacity determination because the HCLPF capacity exceeds the RLGM.

The Indian Point Unit 3 ESEL contains 193 items. Of these, 30 are valves. In accordance with Table 2-4 of EPRI NP-6041-SL, valves may be assigned a functional capacity of 0.8g peak spectral acceleration without any review other than looking for valves with large extended operators on small diameter piping, and anchorage is not a failure mode. Therefore, valves on the ESEL are screened out from ESEP seismic capacity determination, subject to the caveat regarding large extended operators on small diameter piping.

## 6.3 Seismic Walkdown Approach

### 6.3.1 Walkdown Approach

Walkdowns were performed in accordance with the criteria provided in Section 5 of EPRI 3002000704 [2], which refers to EPRI NP-6041-SL [71] for the Seismic Margin Assessment process. Pages 2-26 through 2-30 of EPRI NP-6041-SL describe the seismic walkdown criteria, including the following key criteria.

> *"The SRT [Seismic Review Team] should "walk by" 100% of all components which are reasonably accessible and in non-radioactive or low radioactive environments. Seismic capability assessment of components which are inaccessible, in high-radioactive environments, or possibly within contaminated containment, will have to rely more on alternate means such as photographic inspection, more reliance on seismic reanalysis, and possibly, smaller inspection teams and more hurried inspections. A 100% "walk by" does not mean complete inspection of each component, nor does it mean requiring an electrician or other technician to de-energize and open cabinets or panels for detailed inspection of all components. This walkdown is not intended to be a QA or QC review or a review of the adequacy of the component at the SSE level.*
>
> *If the SRT has a reasonable basis for assuming that the group of components are similar and are similarly anchored, then it is only necessary to inspect one component out of this group. The "similarity-basis" should be developed before the walkdown during the seismic capability preparatory work (Step 3) by reference to drawings, calculations or specifications. The one component or each type which is selected should be thoroughly inspected which probably does mean de-energizing and opening cabinets or panels for this very limited sample. Generally, a spare representative component can be found so as to enable the inspection to be performed while the plant is in operation. At least for the one component of each type which is selected, anchorage should be thoroughly inspected.*
>
> *The walkdown procedure should be performed in an ad hoc manner. For each class of components the SRT should look closely at the first items and compare the field configurations with the construction drawings and/or specifications. If a one-to-one correspondence is found, then subsequent items do not have to be inspected in as great a detail. Ultimately the walkdown becomes a "walk by" of the component class as the SRT becomes confident that the construction pattern is typical. This procedure for inspection should be repeated for each component class; although, during the actual walkdown the SRT may be inspecting several classes of components in parallel. If serious exceptions to the drawings or questionable construction practices are found then the system or component class must be inspected in closer detail until the systematic deficiency is defined.*
>
> *The 100% "walk by" is to look for outliers, lack of similarity, anchorage which is different from that shown on drawings or prescribed in criteria for that component, potential SI [Seismic Interaction] problems, situations that are at odds with the team members' past experience, and any other areas of serious seismic concern. If any such concerns surface, then the limited sample size of one component of each type for thorough inspection will have to be increased. The increase in sample size which should be inspected will depend upon the number of outliers and different anchorages, etc., which are observed. It is up to the SRT to ultimately select the sample size since they are the ones who are responsible for the seismic adequacy of all elements which they screen from the margin review. Appendix D gives guidance for sampling selection."*

### 6.3.2 Application of Previous Walkdown Information

Several ESEL items were previously walked down during the Indian Point Unit 3 seismic IPEEE program, for seismic IPEEE outlier resolutions in accordance with USI A-46 evaluation program and NTTF Recommendation 2.3. Those walkdown results were reviewed and the following steps were taken to confirm that the previous walkdown conclusions remained valid.

- A walk by was performed to confirm that the equipment material condition and configuration is consistent with the walkdown conclusions and that no new significant interactions related to block walls or piping attached to tanks exist.
- If the ESEL item was screened out based on the previous walkdown, that screening evaluation was reviewed and reconfirmed for the ESEP.

### 6.3.3 Significant Walkdown Findings

Consistent with the guidance from EPRI NP-6041-SL [71], no significant outliers or anchorage concerns were identified during the Indian Point Unit 3 seismic walkdowns. Based on walkdown results, HCLPF capacity evaluations were recommended for the following fifteen (15) components:

- RWST-31, Refueling Water Storage Tank
- BATT CHGR 31, Battery Charger 31
- BATT CHGR 32, Battery Charger 32
- BATT CHGR 34, Battery Charger 34
- BATT 33, Battery Bank 33
- BUS2A, Bus 2A 480V
- BUS3A, Bus 3A 480V
- BUS5A, Bus 5A 480V
- BUS6A, Bus 6A 480V
- Rack H1, CCR Aux. Panel Analog Rack H1
- Rack H3, CCR Aux. Panel Analog Rack H3
- FP-T-1, 31 Fire Water Storage Tank
- FP-T-2, 32 Fire Water Storage Tank
- ACAHRS1, RHR HTEXCH # 31
- ACAHRS2, RHR HTEXCH # 32

## 6.4 HCLPF Calculation Process

ESEL items identified for ESEP at Indian Point Unit 3 were evaluated using the criteria in EPRI NP-6041-SL [71] and Section 5 of EPRI 3002000704 [2]. Those evaluations included the following steps:

- Performing seismic capability walkdowns for equipment not included in previous seismic walkdowns (SQUG, IPEEE, or NTTF 2.3) to evaluate the equipment installed plant conditions

- Performing screening evaluations using the screening tables in EPRI NP-6041-SL as described in Section 6.2
- Performing HCLPF calculations considering various failure modes that include both structural failure modes (e.g. anchorage, load path etc.) and functional failure modes

All HCLPF calculations were performed using the CDFM methodology. A total of Seven (7) HCLPF calculations were performed to address the fifteen (15) components.

- Calculation "Battery Chargers 31, 32, & 34" addressing three (3) components BATT CHGR 31, BATT CHGR 32 and BATT CHGR 34
- Calculation "Battery Bank 33" addressing a single component BATT 33
- Calculation "Refueling Water Storage Tank" addressing a single component RWST-31
- Calculation "Station Service Transformers 2, 3, 5, and 6" addressing transformers adjacent to our (4) components BUS2A, BUS3A, BUS5A and BUS6A
- Calculation "RCS Overpressure Racks H-1 and H-3" addressing two (2) instrument racks H1 and H3
- Calculation "Fire Water Storage Tanks FP-T-1 and FP-T-2" addressing two (2) components FP-T-1 and FP-T-2
- Calculation "Residual Heat Exchangers ACAHRS1 and ACAHRS2" addressing two (2) components ACAHRS1 and ACAHRS2

### 6.5 Functional Evaluations of Relays

No seal in/lockout type relays were identified on Indian Point Unit 3 ESEL. Therefore, no relay evaluations were performed.

### 6.6 Tabulated ESEL HCLPF Values (Including Key Failure Modes)

Tabulated ESEL HCLPF values are provided in Attachment B. The following notes apply to the information in the tables.

- For items screened out using EPRI NP-6041-SL [71] screening tables, the HCLPF capacity is provided as >RLGM and the failure mode is listed as "Screened", (unless the controlling HCLPF value is governed by anchorage).
- For items where anchorage controls the HCLPF value, the HCLPF value is listed in the table and the failure mode is noted as "anchorage." For the items where the component function controls the HCLPF value, the HCLPF value is listed in the table and the failure mode is noted as "functional."

After performing the HCLPF calculations, ESEL components were determined to have adequate capacity for the design basis loads and HCLPF greater than RLGM for all components except the following:

- FP-T-1, 31 Fire Water Storage Tank
- FP-T-2, 32 Fire Water Storage Tank

## 7.0 INACCESSIBLE ITEMS

### 7.1 Identification of ESEL Item Inaccessible for Walkdowns

Forty (41) components on the ESEL were previously identified as inaccessible and not walked down since they are located in the Primary Containment Building in a locked high radiation area. These items were walked down during 3R18 refueling outage in March 2015. During these walkdowns, two temperature elements were determined to be the same component. Thus the results for the remaining forty (40) components are now detailed in Attachment B.

Also, the two (2) Hydraulic Isolators, one (1) valve and one (1) Terminal Box listed below were not walked down due to the plant condition (inaccessible due to contamination/high radiation) at the time of the walkdowns. Subject components were evaluated based on the review of the recent photos of the components and the general area.

- LIS-1311, Hydraulic Isolator
- LIS-1312, Hydraulic Isolator
- MOV-882, RHR Pump Suction Isolation Valve
- Y29, Terminal Box

### 7.2 Planned Walkdown / Evaluation Schedule / Close Out

No follow up walkdowns are required.

## 8.0 ESEP CONCLUSIONS AND RESULTS

### 8.1 Supporting Information

Indian Point Unit 3 has performed the ESEP as an interim action in response to the NRC's 50.54(f) letter [1]. It was performed using the methodologies in the NRC endorsed guidance in EPRI 3002000704 [2].

The ESEP provides an important demonstration of seismic margin and expedites plant safety enhancements through evaluations and potential near-term modifications of plant equipment that can be relied upon to protect the reactor core following beyond design basis seismic events.

The ESEP is part of the overall Indian Point Unit 3 response to the NRC's 50.54(f) letter. On March 12, 2014, NEI submitted to the NRC results of a study [76] of seismic core damage risk estimates based on updated seismic hazard information as it applies to operating nuclear reactors in the Central and Eastern United States (CEUS). The study concluded that "site-specific seismic hazards show that there has not been an overall increase in seismic risk for the fleet of U.S. plants" based on the re-evaluated seismic hazards [69]. As such, the "current seismic design of operating reactors continues to provide a safety margin to withstand potential earthquakes exceeding the seismic design basis."

The NRC's May 9, 2014 NTTF 2.1 Screening and Prioritization letter [75] concluded that the "fleet wide seismic risk estimates are consistent with the approach and results used in the GI-199 safety/risk assessment." The letter also stated that "As a result, the staff has confirmed that the conclusions reached in GI-199 safety/risk assessment remain valid and that the plants can continue to operate while additional evaluations are conducted."

An assessment of the change in seismic risk for Indian Point Unit 3 was included in the fleet risk evaluation submitted in the March 12, 2014 NEI letter [76]; therefore, the conclusions in the NRC's May 9 letter also apply to Indian Point Unit 3.

In addition, the March 12, 2014 NEI letter provided an attached "Perspectives on the Seismic Capacity of Operating Plants," which (1) assessed a number of qualitative reasons why the design of Structures, Systems and Components (SSCs) inherently contain margin beyond their design level, (2) discussed industrial seismic experience databases of performance of industry facility components similar to nuclear SSCs, and (3) discussed earthquake experience at operating plants.

The fleet of currently operating nuclear power plants was designed using conservative practices, such that the plants have significant margin to withstand large ground motions safely. This has been borne out for those plants that have actually experienced significant earthquakes. The seismic design process has inherent (and intentional) conservatisms which result in significant seismic margins within SSCs. These conservatisms are reflected in several key aspects of the seismic design process, including:

- Safety factors applied in design calculations
- Damping values used in dynamic analysis of SSCs
- Bounding synthetic time histories for in-structure response spectra calculations
- Broadening criteria for in-structure response spectra
- Response spectra enveloping criteria typically used in SSC analysis and testing applications
- Response spectra based frequency domain analysis rather than explicit time history based time domain analysis
- Bounding requirements in codes and standards
- Use of minimum strength requirements of structural components (concrete and steel)
- Bounding testing requirements
- Ductile behavior of the primary materials (that is, not crediting the additional capacity of materials such as steel and reinforced concrete beyond the essentially elastic range, etc.)

These design practices combine to result in margins such that the SSCs will continue to fulfill their functions at ground motions well above the SSE.

The intent of the ESEP is to perform an interim action in response to the NRC's 50.54(f) letter to demonstrate seismic margin through a review of a subset of the plant equipment that can be relied upon to protect the reactor core following beyond design basis seismic events. The RLGM used for the ESEP evaluation is a scaled version of the plant's SSE rather than the actual GMRS. To more fully characterize the risk impacts of the seismic ground motion represented by the GMRS on a plant specific basis, a more detailed seismic risk assessment (SPRA or risk-based SMA) is to be performed in accordance with EPRI 1025287 [68]. As identified in the Indian Point Unit 3 Seismic Hazard and GMRS submittal [69], Indian Point Unit 3 screens in for a risk evaluation. The complete risk evaluation will more completely characterize the probabilistic seismic ground motion input into the plant, the plant response to that probabilistic seismic ground motion input, and the resulting plant risk characterization. Indian Point Unit 3 will complete that evaluation in accordance with the schedule identified in NEI's letter dated April 9, 2013 [77] and endorsed by the NRC in their May 7, 2013 letter [78].

## 8.2 Identification of Planned Modifications

Insights from the ESEP identified the following items where the HCLPF is below the RLGM and plant modifications will be made in accordance with EPRI 3002000704 [2] to enhance the seismic capacity of the plant. Subject modifications are planned to provide additional seismic margin such that the HCLPF will exceed the RLGM.

- FP-T-1, 31 Fire Water Storage Tank
- FP-T-2, 32 Fire Water Storage Tank

## 8.3 Modification Implementation Schedule

Plant modifications described in Section 8.2 will be performed in accordance with the schedule identified in NEI letter dated April 9, 2013 [77], which states that plant modifications not requiring a planned refueling outage will be completed by December 2016 and modifications requiring a refueling outage will be completed within two planned refueling outages after December 31, 2014.

## 8.4 Summary of Regulatory Commitments

The following actions will be performed as a result of the ESEP.

| Action # | Equipment ID | Equipment Description | Action Description | Completion Date |
|---|---|---|---|---|
| 1 | FP-T-1 | 31 Fire Water Storage Tank | Modify tank and anchorage such that HCLPF>RLGM | As described in Section 8.3 |
| 2 | FP-T-2 | 32 Fire Water Storage Tank | Modify tank and anchorage such that HCLPF>RLGM | As described in Section 8.3 |
| 3 | N/A | N/A | Submit a letter to NRC summarizing the HCLPF results of Items 1 and 2 confirming implementation of the plant modifications associated with items 1 and 2. | Within 60 days following completion of ESEP activities, including items 1 and 2. |

## 9.0 REFERENCES

1. NRC (E Leeds and M Johnson) Letter to All Power Reactor Licensees et al., "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3 and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident," March 12, 2012.
2. EPRI 3002000704, "Seismic Evaluation Guidance, Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic," May 2013.
3. Entergy Letter to U.S. NRC, letter number NL-13-042 "Overall Integrated Plan in Response to March 12, 2012, Commission Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," February 28, 2013, NRC ADAMS Accession No. ML13079A348.
4. Entergy Letter to U.S. NRC, letter number NL-14-031, "Indian Point Energy Center's Second Six-Month Status Report for the Implementation of Order EA-12-049 Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," February 27, 2014, NRC ADAMS Accession No. ML14070A365.
5. Entergy Letter to U.S. NRC, letter number NL-14-110, "Indian Point Energy Center's Third Six-Month Status Report for the Implementation of Order EA-12-049 Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," August 27, 2014, NRC ADAMS Accession No. ML14251A227.
6. Entergy Engineering Evaluation, EC No. 45874, Revision 1, "FLEX-Beyond Design Basis External Event Phases I, II, and III Strategy Development Evaluation."
7. Entergy Drawing 9321-F-20173, Revision 72, "Flow Diagram Main Steam."
8. Entergy System Design Description 21.2, Revision 8, "System Description 21.2, Auxiliary Feedwater System."
9. Entergy Drawing 9321-F-70313, Revision 17, "Auxiliary Boiler Feed Pump Room Instrument Piping Sheet No.1 Instrumentation."
10. Entergy Drawing 9321-F-27233, Revision 40, "Flow Diagram Nitrogen to Nuclear Equipment."
11. Entergy Plant Equipment Database for Indian Point Unit 3.
12. Entergy Drawing 9321-F-20193, Revision 62, "Flow Diagram Boiler Feedwater."
13. Entergy Drawing 9321-LD-72123, Sheet 9, Revision 2, "Aux. F.W. Flow to Steam Generator #31 Loop F-1200 Diagram."
14. Entergy Drawing 9321-LD-72123, Sheet 10 Revision 2, "Aux. F.W. Flow to Steam Generator #32 Loop F-1201 Diagram."
15. Entergy Drawing 9321-LD-72123, Sheet 11, Revision 2, "Aux. F.W. Flow to Steam Generator #33 Loop F-1202 Diagram."
16. Entergy Drawing 9321-LD-72123, Sheet 12, Revision 2, "Aux. F.W. Flow to Steam Generator #34 Loop F-1203 Diagram."
17. Entergy Drawing 9321-F-31673, Revision 28, "Wiring Diagram 480V Switchgear Miscellaneous."

18. Entergy Drawing 9321-F-70033, Revision 17, "Transmitter Racks Piping Arrangement – Sheet No. 2 Instrumentation for Indian Point Energy Center Unit No. 3."

19. Entergy System Design Description 21.1, Revision 4, "System Description 21.1, Steam Generator Water Level Control."

20. Entergy Drawing 9321-F-70253, Revision 10, "Primary Plant Instrument Piping & Supports – Sheet No. 1 Instrumentation."

21. Entergy Drawing 9321-H-39903 Sheet 70, Revision 5, "Rack D-9 Layout."

22. Entergy Drawing 9321-F-32273, Revision 41, "Wiring Diagram Supervisory Control Panel SC."

23. Entergy Drawing 9321-F-70513, Revision 17, "Transmitter Racks Piping Arrangement – Sheet No. 4 Instrumentation."

24. Entergy Drawing 9321-F-10023, Revision 22, "Plot Plan."

25. Entergy Drawing 9321-F-20183 Sheet 1, Revision 63, "Flow Diagram Condensate & Boiler Feed Pump Suction."

26. Entergy Drawing 9321-F-27353, Revision 42, "Flow Diagram Safety Injection System Sheet No. 1."

27. Entergy System Design Description 10.1, Revision 10, "System Description 10.1, Safety Injection System."

28. Entergy System Design Description 3.0, Revision 8, "System Description 3.0, Chemical and Volume Control System."

29. Entergy System Design Description 4.2, Revision 7, "System Description 4.2, Residual Heat Removal System."

30. Entergy System Design Description 1.4, Revision 7, "System Description 1.4, Pressurizer & Pressurizer Relief Tank."

31. Entergy Drawing 9321-F-33853, Revision 19, "Electrical Distribution & Transmission System."

32. Entergy Drawing 9321-F-30063 Sheet 1, Revision 81, "Single Line Diagram 480V Motor Control Center No.'s 36A, 36B & 36C."

33. Entergy Drawing 9321-F-27363, Revision 52, Flow Diagram Chemical & Volume Control System Sheet No. 1."

34. Entergy Drawing 9321-F-27513 Sheet 1, Revision 31, "Flow Diagram Auxiliary Coolant System In PAB & FSB Sheet No. 1."

35. Entergy Drawing 9321-F-27503, Revision 55, "Flow Diagram Safety Injection System Sheet No. 2."

36. Entergy Drawing 9321-F-27203, Revision 29, "Flow Diagram Auxiliary Coolant System Inside Containment."

37. Entergy Drawing 9321-F-27473, Revision 43, "Flow Diagram Reactor Coolant System Sheet No. 2."

38. Entergy Drawing 9321-F-36383, Revision 4, "Miscellaneous Wiring Details RCS-SOV-652, RCS-SOV-653, RCS-SOV-654, & RCS-SOV-655."

39. Entergy Drawing 9321-F-30053, Revision 72, "Single Line Diagram 480V Motor Control Centers 37, 38, 39, & 311."

40. Entergy Drawing 9321-F-30083, Revision 60, "Single Line Diagram D.C. System."

41. Entergy Drawing IP3V-0454-0041, Revision 1, Structural Detail for Seismic Category 1 Instrument Rack."

42. Entergy Calculation IP-CALC-07-00154, Revision 0, "Containment Atmospheric Temperature."

43. Entergy Drawing 9321-F-33433, Revision 7, "Containment Parameters System Wiring Diagram."

44. Entergy Drawing 9321-H-39913 Sheet 8, Revision 8, "External Connection Diagram R.P.S. Rack No. 8 (A-7)."

45. Entergy Drawing 9321-H-36723, Revision 0, "Cover Plates on Flight Pnl. "FCF" & Supervisory Pnl. "SCF" – Fabrication Mounting Details."

46. Entergy Drawing 9321-F-20303, Revision 30, "Flow Diagram Fuel Oil to Diesel Generators."

47. Entergy Drawing 9321-F-39893, Revision 43, "Single Line Diagram 118VAC Instrument Buses 31, 31A, 32, 32A, 33, 33A, 34, & 34A."

48. Entergy Document IP3-RPT-UNSPEC-02182, Indian Point Three Nuclear Power Plant Individual Plant Examination of External Events," September 1997.

49. Entergy Drawing 9321-F-32723, Revision 28, Wiring Diagram Flight Control Pnl. FCF & FCR."

50. Entergy Drawing 9321-LD-72453 Sheet 21A, Revision 2, "Overpressurization System Channel 1 Loop P/T-413 Diagram."

51. Entergy Drawing 9321-LD-72453 Sheet 23A, Revision 2, "Overpressurization System Channel 4 Loop P/T-443 Diagram."

52. Entergy Drawing 9321-LD-72453 Sheet 21, Revision 3, "Overpressurization System Channel 1 Loop P/T-413 Diagram."

53. Entergy Drawing 9321-LD-72453 Sheet 23, Revision 3, "Overpressurization System Channel 4 Loop P/T-443 Diagram."

54. Entergy Drawing 9321-F-27383, Revision 28, "Flow Diagram Reactor Coolant System Sheet No. 1."

55. Entergy Drawing 9321-LL-36853, Sheet 1, Revision 3, "Schematic Block Diagram Reactor Vessel Level Instrument System Train "A"."

56. Entergy Drawing 9321-F-33203, Sheet 1, Revision 24, "Conduit & Tray Connection Schematic Containment Building."

57. Entergy Drawing 9321-F-33313, Sheet 2, Revision 6, "Conduit & Tray Connection Schematic Fan House."

58. Entergy Drawing 9321-F-30793, Revision 50, "Conduit Layout Containment Building Piping Penetration Area – Fan House."

59. Entergy Drawing 9321-F-72043, Revision 7, "Containment Building Reactor Vessel Level Instrumentation System Flow Diagram."

60. Entergy Drawing 9321-F-70283, Revision 25, Containment Building Instrument Arrangement Sheet No. 2 Instrumentation."

61. Entergy Drawing 9321-F-39933, Revision 19 "Conduit Layout TSI Room, CFM Multiplexer Room, Control Building EL. 53'-0" & Roof El. 72'-7."

62. Entergy Drawing 9321-F-95273 Sheet 1, Revision 6, "Control Room RVLIS Rack – Train "A" Interconnection Wiring Diagram."

63. Entergy Procedure 3-ECA-0.0, Revision 9, "Loss of All AC Power."

64. Entergy Drawing 9321-F-32383, Revision 31, "Wiring Diagram Supervisory Control Panel SB2."

65. Entergy System Design Description 1.1, Revision 5, "System Description 1.1, Reactor Coolant System."

66. Entergy Drawing IP3V-0245-0001, Revision 0, "40'-0" OD x 40'-0" High Fire Protection Water Storage Tanks "FP-Tk-1" & "FP-Tk-2" Pipe Support Details."

67. Entergy System Design Description 18.0, Revision 7, "System Description 18.0, Main and Reheat Steam."

68. EPRI 1025287, "Seismic Evaluation Guidance: Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic. Electric Power Research Institute," February 2013.

69. Entergy Letter NL-14-043, John A. Ventosa to NRC, "Entergy Seismic Hazard and Screening Report (CEUS Sites), Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident dated March 31, 2014." NRC ADAMS Accession No. ML14099A111.

70. "Indian Point Energy Center Unit 3 Updated Final Safety Analysis Report," Revision 5, Docket No. 50-286, 2013.

71. EPRI-NP-6041-SL, "Methodology for Assessment of Nuclear Power Plant Seismic Margin," Revision 1, August 1991.

72. EPRI TR-103959, "Methodology for Developing Seismic Fragilities," July 1994.

73. NRC NUREG-1407, "Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities," June 1991.

74. SQUG, "Generic Implementation Procedure (GIP) for Seismic Verification of Nuclear Plant Equipment, Seismic Qualification Utility Group," Revision 3A, December 2001.

75. NRC (E. Leeds) Letter to All Power Reactor Licensees et al., "Screening and Prioritization Results Regarding Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(F) Regarding Seismic Hazard Re-Evaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights From the Fukushima Dai-Ichi Accident," May 9, 2014.

76. Nuclear Energy Institute (NEI), A. Pietrangelo, Letter to D. Skeen of the USNRC, "Seismic Core Damage Risk Estimates Using the Updated Seismic Hazards for the Operating Nuclear Plants in the Central and Eastern United States," March 12, 2014.

77. Nuclear Energy Institute (NEI), A. Pietrangelo, Letter to D. Skeen of the USNRC, "Proposed Path Forward for NTTF Recommendation 2.1: Seismic Reevaluations," April 9, 2013, NRC ADAMS Accession No. ML13101A379.

78. NRC (E Leeds) Letter to NEI (J Pollock), "Electric Power Research Institute Final Draft Report xxxxx, "Seismic Evaluation Guidance: Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic," as an Acceptable Alternative to the March 12, 2012, Information Request for Seismic Reevaluations," May 7, 2013.

79. Entergy Document EC54071, "ESEP Reports," the following AREVA documents are captured in the plant document management system:

    a. AREVA Document 51-9212951-007, "ESEP Expedited Seismic Equipment List (ESEL) – Indian Point Unit 3."

    b. AREVA Calculation 32-9227208-000, "Indian Point Unit 3 ESEP HCLPF Calculation – Station Service Transformers 2, 3, 5, and 6."

    c. AREVA Calculation 32-9227381-000, "Indian Point Unit 3 ESEP HCLPF Calculation – Battery Bank 33 (BATT 33)."

    d. AREVA Calculation 32-9227576-000, "Indian Point Unit 3 ESEP HCLPF Calculation – Battery Chargers 31, 32, & 34."

    e. AREVA Calculation 32-9230353-000, "Indian Point Unit 3 ESEP HCLPF Calculation – Refueling Water Storage Tank, RWST-31."

    f. AREVA Calculation 32-9230692-000, "Indian Point Unit 3 ESEP HCLPF Calculation – RCS Overpressure Racks H-1 and H-3."

    g. AREVA Document 32-9232897-000, "Indian Point Unit 3 ESEP Calculation – Fire Water Storage Tanks FP-T-1 and FP-T-2."

    h. AREVA Calculation 32-9238938-000, "Indian Point Unit 3 ESEP HCLPF Calculation – Residual Heat Exchangers ACAHRS1 and ACAHRS2."

# ATTACHMENT A – INDIAN POINT UNIT 3 ESEL

| ESEL Item Number | Equipment | | Operating State | | Notes/Comments | References |
|---|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | | |
| 1 | MS-45-2 | Steam Generator 32 Safety Relief Valve | Closed | Open | - | [7] |
| 2 | MS-45-3 | Steam Generator 33 Safety Relief Valve | Closed | Open | - | [7] |
| 3 | PCV-1135 | ATM Steam Relief Valve 32 Steam Generator | Closed | Cycled | - | [7] |
| 4 | PCV-1136 | ATM Steam Relief Valve 33 Steam Generator | Closed | Cycled | - | [7] |
| 5 | PNL #1 | ATM Steam Dump Panel #1 | On | On | - | [9][67] |
| 6 | PNL #2 | ATM Steam Dump Panel #2 | On | On | - | [9][67] |
| 7 | 32 ABFP | Turbine Driven Auxiliary Feedwater Pump No. 32 | Standby | Operating | - | [7][12][8] |
| 8 | BFD-PCV-1213 | Pressure Control Valve for Bearing Cooler | Closed | Open | - | [12][8] |
| 9 | HCV-1118 | 32 AFW Pump Turbine Governor | Closed | Open | - | [10][8] |
| 10 | MS-PCV-1139 | Main Steam to AFW Turbine PCV | Closed | Open | - | [7][8] |
| 11 | MS-PCV-1310A | 32 Auxiliary Boiler Feed Pump Steam Supply First Isolation | Closed | Open | Fails open on loss of instrument air or manually open per procedure | [7][63][8] |
| 12 | MS-PCV-1310B | 32 Auxiliary Boiler Feed Pump Steam Supply Second Isolation | Closed | Open | Fails open on loss of instrument air or manually open per procedure | [7][63][8] |
| 13 | PNL PT2 | Auxiliary Boiler Feed Pump Control Station | Off | On | - | [17][8] |

| ESEL Item Number | Equipment | | Operating State | | Notes/Comments | References |
|---|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | | |
| 14 | FT-1201 | AFW to SG 32 Flow Transmitter | Off | On | - | [12][14] |
| 15 | FT-1202 | AFW to SG 33 Flow Transmitter | Off | On | - | [12][15] |
| 16 | FI-1201 | AFW to SG 32 Flow Indicator | On | On | - | [12][14] |
| 17 | FI-1202 | AFW to SG 33 Flow Indicator | On | On | - | [12][15] |
| 18 | RACK 26 | Pressure Transmitter Rack #26 | On | On | - | [18][13][14] [15][16] |
| 19 | RACK D-9 | CCR Rack "D9" (NIS MISC Instrument) | On | On | - | [21] [13][14][15] [16] |
| 20 | PNL SC Supervisory Panel | Condenser & Feedwater Supervisory Panel | On | On | - | [22] [13][14][15] [16] |
| 21 | BFD-FCV-405B | No. 32 AFW Pump Manual Flow Control to 32 SG | Closed | Open | Per Local Equipment Procedure Manually Open Valves | [12][8] |
| 22 | BFD-FCV-405C | No. 32 AFW Pump Manual Flow Control to 33 SG | Closed | Open | Per Local Equipment Procedure Manually Open Valves | [12][8] |
| 23 | LT-427D | SG 32 Level Transmitter | On | On | - | [12][23][19] [11][20] |
| 24 | LT-437D | SG 33 Level Transmitter | On | On | - | [12][23][19] [11][20] |
| 25 | LI-427D | SG 32 Level Indicator | On | On | - | [19] |
| 26 | LI-437D | SG 33 Level Indicator | On | On | - | [19] |

| ESEL Item Number | Equipment | | Operating State | | Notes/Comments | References |
|---|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | | |
| 27 | RACK 21 | Steam Generators Level Transmitter Rack | On | On | - | [23][20] |
| 28 | PT-429C | SG 32 Steam Pressure Transmitter | On | On | - | [7][18] |
| 29 | PT-439C | SG 33 Steam Pressure Transmitter | On | On | - | [7][18] |
| 30 | PI-1354 | SG 32 Steam Pressure Indicator | On | On | Indication in AFW Pump Local Control Station | [7] |
| 31 | PI-1355 | SG 33 Steam Pressure Indicator | On | On | Indication in AFW Pump Local Control Station | [7] |
| 32 | RACK 9 | Instrument Rack 9 | Operating | Operating | - | [18] |
| 33 | CST | Condensate Storage Tank | Available | Available | - | [24][25] |
| 34 | LI 1102-S | CST Level Indicator | Operating | Operating | - | [25] |
| 35 | LCV-1158-2 | CST Low Level Control Valve | Open | Closed | - | [25] |
| 36 | LCV-1158-1 | CST to Condensers Level Control Valve | Open | Closed | - | [25] |
| 37 | SI-MOV-894A | No. 31 Accumulator Isolation Valve | Open | Closed | - | [26][27] |
| 38 | SI-MOV-894B | No. 32 Accumulator Isolation Valve | Open | Closed | - | [26][27] |
| 39 | SI-MOV-894C | No. 33 Accumulator Isolation Valve | Open | Closed | - | [26][27] |
| 40 | SI-MOV-894D | No. 34 Accumulator Isolation Valve | Open | Closed | - | [26][27] |

| ESEL Item Number | Equipment | | Operating State | | Notes/Comments | References |
|---|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | | |
| 41 | 36AMCC | Primary Auxiliary Building Motor Control Center 36A | On | On | - | [31][32] |
| 42 | 36BMCC | Primary Auxiliary Building Motor Control Center 36B | On | On | - | [31][32] |
| 43 | CH-MOV-222 | RCP Seal Water Return Isolation Valve | Open | Closed | Per Loss of All AC Power Procedure Manually Close Valves | [33][63] |
| 44 | AC-FCV-625 | Thermal Barrier Isolation Valve | Open | Closed | Per Loss of All AC Power Procedure Manually Close Valves | [34][63] |
| 45 | RWST-31 | Refueling Water Storage Tank | Available | Available | - | [35] |
| 46 | ACAHRS1 | RHR HTEXCH # 31 | Intact | Intact | Gravity feed path from RWST through heat exchanger | [36][29] |
| 47 | ACAHRS2 | RHR HTEXCH # 32 | Intact | Intact | Gravity feed path from RWST through heat exchanger | [36][29] |
| 48 | RCS-SOV-652 | Reactor Head Vent | Closed | Open | 125VDC Distribution Panel 32A | [37][38][65] |
| 49 | RCS-SOV-653 | Reactor Head Vent | Closed | Open | 125VDC Distribution Panel 32A | [37][38][65] |
| 50 | PNL SBF-1 | Supervisory Panel SBF1 | On | On | - | [38] |
| 51 | EHT Panel 34 | Electric Heat Trace Panel 34 | On | On | Powered by MCC 37 | [39] |
| 52 | 37MCC | Primary Auxiliary Building Motor Control Center 37 | On | On | 480VAC Bus 6A feeds to Primary Auxiliary Building 480V MCC 37 which powers Battery Charger 32 | [31][39] |
| 53 | PNL K49 | 125 VDC Distribution Panel 32A | On | On | - | [31][40] |
| 54 | PT-1421 | CTMT Pressure Transmitter | On | On | - | [35][41] |

| ESEL Item Number | Equipment | | Operating State | | Notes/Comments | References |
|---|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | | |
| 55 | PR-1421 | CTMT Pressure Recorder | On | On | - | [43] |
| 56 | TE-1416-1 | Fan 31 Temperature Element | On | On | - | [44][42] |
| 57 | TE-1416-2 | Fan 32 Temperature Element | On | On | - | [44][42] |
| 58 | TE-1416-3 | Fan 33 Temperature Element | On | On | - | [44][42] |
| 59 | TE-1416-4 | Fan 34 Temperature Element | On | On | - | [44][42] |
| 60 | TE-1416-5 | Fan 35 Temperature Element | On | On | - | [44][42] |
| 61 | RACK 24A | Instrument Rack | On | On | - | [41] |
| 62 | EDG-31-FO-STNK | Fuel Oil Storage Tank 31 | Available | Available | - | [46][48] |
| 63 | EDG-32-FO-STNK | Fuel Oil Storage Tank 32 | Available | Available | - | [46][48] |
| 64 | EDG-33-FO-STNK | Fuel Oil Storage Tank 33 | Available | Available | - | [46][48] |
| 65 | 31IB | 118V AC Instrument Bus 31 Channel II | On | On | - | [31][47] |
| 66 | 32IB | 118V AC Instrument Bus 32 Channel I | On | On | - | [31][47] |
| 67 | 34IB | 118V AC Instrument Bus 34 Channel III | On | On | - | [31][47] |
| 68 | 33IB | 118V AC Instrument Bus 33 Channel IV | On | On | - | [31][47] |

| ESEL Item Number | Equipment | | Operating State | | Notes/Comments | References |
|---|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | | |
| 69 | 31AIB | 118V AC Instrument Bus 31A Channel II | On | On | - | [31][47] |
| 70 | 32AIB | 118V AC Instrument Bus 32A Channel I | On | On | - | [31][47] |
| 71 | 34AIB | 118V AC Instrument Bus 34A Channel III | On | On | - | [31][47] |
| 72 | 33AIB | 118V AC Instrument Bus 33A Channel IV | On | On | - | [31][47] |
| 73 | 34 INVERTER | Static Inverter 34 | On | On | - | [31][40][48] |
| 74 | 33 INVERTER | Static Inverter 33 | On | On | - | [31][40][48] |
| 75 | 31 INVERTER | Static Inverter 31 | On | On | - | [31][40][48] |
| 76 | 32 INVERTER | Static Inverter 32 | On | On | - | [31][40][48] |
| 77 | 31DP | 125VDC Distribution Panel 31 | On | On | - | [31][40][48] |
| 78 | 32DP | 125VDC Distribution Panel 32 | On | On | - | [31][40] |
| 79 | 33DP | 125VDC Distribution Panel 33 | On | On | - | [31][40][48] |
| 80 | 34DP | 125VDC Distribution Panel 34 | On | On | - | [31][40][48] |
| 81 | PNL K48 | 125 VDC Distribution Panel 31A | On | On | - | [31][40][48] |
| 82 | 31PP | 125VDC Power Panel 31 | On | On | - | [31][40][48] |

| ESEL Item Number | Equipment | | Operating State | | Notes/Comments | References |
|---|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | | |
| 83 | 32PP | 125VDC Power Panel 32 | On | On | - | [31][40][48] |
| 84 | 33PP | 125VDC Power Panel 33 | On | On | - | [31][40][48] |
| 85 | 34PP | 125VDC Power Panel 34 | On | On | - | [31][40][48] |
| 86 | BATT CHGR 31 | Battery Charger 31 | On | On | - | [31][40] |
| 87 | BATT CHGR 32 | Battery Charger 32 | On | On | - | [31][40] |
| 88 | BATT CHGR 33 | Battery Charger 33 | On | On | - | [31][40] |
| 89 | BATT CHGR 34 | Battery Charger 34 | On | On | - | [31][40] |
| 90 | BATT 31 | Battery Bank 31 | On | On | - | [31][40] |
| 91 | BATT 32 | Battery Bank 32 | On | On | - | [31][40] |
| 92 | BATT 34 | Battery Bank 34 | On | On | | [31][40] |
| 93 | BATT 33 | Battery Bank 33 | On | On | - | [31][40] |
| 94 | BUS2A | 480V(SWGR 31) Bus 2A | On | On | - | [31] |
| 95 | BUS3A | 480V(SWGR 32) Bus 3A | On | On | - | [31] |
| 96 | BUS5A | 480V(SWGR31) Bus 5A | On | On | - | [31] |

| ESEL Item Number | Equipment | | Operating State | | Notes/Comments | References |
|---|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | | |
| 97 | BUS6A | 480V(SWGR 32) Bus 6A | On | On | - | [31] |
| 98 | 36CMCC | Primary Auxiliary Building Motor Control Center 36C | On | On | - | [31] |
| 99 | 39MCC | Control Building Motor Control Center 39 | On | On | - | [31] |
| 100 | 32MCC | Turbine-Generator Building Motor Control Center 32 | On | On | - | [31] |
| 101 | NI 31B | Source Range Count Rate Meter | On | On | - | [48] |
| 102 | NI 31D | Source Range Count Rate Meter | On | On | - | [48] |
| 103 | FE1 | Preamplifier For NE-31 | On | On | - | [48] |
| 104 | PNL FCF | Flight Control Panel FC | On | On | - | [48][49] |
| 105 | PI-413K | Loop 31 Hot Leg Pressure Indicator | On | On | - | [50] |
| 106 | PI-443K | Loop 34 Hot Leg Pressure Indicator | On | On | - | [51] |
| 107 | PT-413 | Loop 31 Hot Leg Pressure Transmitter | On | On | - | [52][54] |
| 108 | PT-443 | Loop 34 Hot Leg Pressure Transmitter | On | On | - | [53][54] |
| 109 | TE-1313 | Upper Tap Compensation Temperature Element | On | On | - | [59] |
| 110 | TE-1314 | Upper Tap Compensation Temperature Element | On | On | - | [59] |

| ESEL Item Number | Equipment | | Operating State | | Notes/Comments | References |
|---|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | | |
| 111 | TE-1317 | RVWL Conduit Compensation Temperature Element | On | On | - | [59] |
| 112 | TE-1318 | RVWL Conduit Compensation | On | On | - | [59] |
| 113 | TE-1319 | RVWL Lower Tap Capillary Temperature Element | On | On | - | [59] |
| 114 | TE-413A | RCS Loop 31 Hot Leg Wide Range Temperature Element | On | On | - | [60] |
| 115 | TE-423A | RCS Loop 32 Hot Leg Wide Range Temperature Element | On | On | - | [48][60] |
| 116 | CAB JR9 | RVLIS Cabinet | On | On | - | [48][61][62] |
| 117 | LI-1311 | RVWL Narrow Range Indicator | On | On | - | [48] |
| 118 | LI-1312 | RVWL Wide Range Indicator | On | On | - | [48] |
| 119 | LT-1311 | Reactor Vessel Level Transmitter Narrow Range | On | On | - | [48][59] |
| 120 | LT-1312 | Reactor Vessel Level Transmitter Narrow Range | On | On | - | [48][59] |
| 121 | TI-1416 | Containment Atmospheric Temperature Indicator | On | On | - | [44] |
| 122 | PM-413K | Loop 31 Hot Leg Pressure | On | On | - | [50] |
| 123 | 31AIB-2 (J01) | Containment Parameters Recording Cabinet (Channel I) | On | On | - | [43] |
| 124 | PM-443K | Loop 34 Hot Leg Pressure | On | On | - | [51] |

| ESEL Item Number | Equipment | | Operating State | | Notes/Comments | References |
|---|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | | |
| 125 | PC-413 | Loop 31 Hot Leg Pressure | On | On | - | [52] |
| 126 | PC-443 | Loop 34 Hot Leg Pressure | On | On | - | [53] |
| 127 | PQ-413 | Loop 31 Hot Leg Pressure | On | On | - | [52] |
| 128 | PQ-443 | Loop 34 Hot Leg Pressure | On | On | - | [53] |
| 129 | PNL SBF-2 | Supervisory Control Panel SB-2 | On | On | - | [64] |
| 130 | RACK H1 | CCR Auxiliary Panel Analog Rack H1 | On | On | - | [52] |
| 131 | RACK H3 | CCR Auxiliary Panel Analog Rack H3 | On | On | - | [53] |
| 132 | Panel SFF | Supervisory Panel SF | On | On | - | [50][51] |
| 133 | RVLIS RACK TRAIN A | RVLIS Rack Train A | On | On | - | [48][59] |
| 134 | MS-45-1 | Steam Generator 31 Safety Relief Valve | Closed | Open | - | [7] |
| 135 | MS-45-4 | Steam Generator 34 Safety Relief Valve | Closed | Open | - | [7] |
| 136 | PCV-1134 | ATM Steam Relief Valve 31 Steam Generator | Closed | Cycled | Manual Operation | [7] |
| 137 | PCV-1137 | ATM Steam Relief Valve 34 Steam Generator | Closed | Cycled | Manual Operation | [7] |
| 138 | N2 TANKS | Backup Nitrogen Cylinders | Intact | Intact | - | [67][9] |

| ESEL Item Number | Equipment | | Operating State | | Notes/Comments | References |
|---|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | | |
| 139 | IA-PCV-1278 | Nitrogen Pressure Regulator | Closed | Open | - | [67][9][10] [11] |
| 140 | IA-PCV-1277 | Nitrogen Pressure Regulator | Closed | Open | - | [67][9][10] [11] |
| 141 | MS-577 | 32 AFW Pump Overspeed Trip & Governor Valve | Intact | Intact | Part of the TDAFWP Skid | [8][11] |
| 142 | FT-1200 | AFW to SG 31 Flow Transmitter | Off | On | - | [12][13] |
| 143 | FT-1203 | AFW to SG 34 Flow Transmitter | Off | On | - | [12][16] |
| 144 | FI-1200 | AFW to SG 31 Flow Indicator | On | On | - | [12][13] |
| 145 | FI-1203 | AFW to SG 34 Flow Indicator | On | On | - | [12][16] |
| 146 | BFD-FCV-405A | No. 32 AFW Pump Manual Flow Control to 31 SG | Closed | Open | Manually Open Valves | [12] |
| 147 | BFD-FCV-405D | No. 32 AFW Pump Manual Flow Control to 34 SG | Closed | Open | Manually Open Valves | [12] |
| 148 | LT-417D | SG 31 Level Transmitter | On | On | - | [12][23][19] [11][20] |
| 149 | LT-447D | SG 34 Level Transmitter | On | On | - | [12][23][19] [11][20] |
| 150 | LI-417D | SG 31 Level Indicator | On | On | - | [19] |
| 151 | LI-447D | SG 34 Level Indicator | On | On | - | [19] |
| 152 | LQ-417D | Steam Generator Level | On | On | - | [11] |

| ESEL Item Number | Equipment | | Operating State | | Notes/Comments | References |
|---|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | | |
| 153 | LQ-427D | Steam Generator Level | On | On | - | [11] |
| 154 | LQ-437D | Steam Generator Level | On | On | - | [11] |
| 155 | LQ-447D | Steam Generator Level | On | On | - | [11] |
| 156 | RACK B10 | Instrument Rack | On | On | - | [11] |
| 157 | RACK B5 | Instrument Rack | On | On | - | [11] |
| 158 | PI-1353 | SG 31 Steam Pressure Indicator | On | On | Local Indication | [7] |
| 159 | PI-1356 | SG 34 Steam Pressure Indicator | On | On | Local Indication | [7] |
| 160 | ACCUM. 31 | Accumulator Tank 31 | Intact | Intact | - | [26][27][11] |
| 161 | ACCUM. 32 | Accumulator Tank 32 | Intact | Intact | - | [26][27][11] |
| 162 | ACCUM. 33 | Accumulator Tank 33 | Intact | Intact | - | [26][27][11] |
| 163 | ACCUM. 34 | Accumulator Tank 34 | Intact | Intact | - | [26][27][11] |
| 164 | CH-LCV-459 | Letdown Isolation Valve | Open | Closed | Fail Closed on Loss of instrument air | [28][11] |
| 165 | CH-HCV-133 | RHR LP Bypass Valve | Open | Closed | - | [28][11] |
| 166 | MOV-882 | RHR Pump Suction Isolation Valve | Closed | Open | Powered from MCC 36B | [29] |

| ESEL Item Number | Equipment | | Operating State | | Notes/Comments | References |
|---|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | | |
| 167 | LT-459 | Pressurizer Level Transmitter | On | On | - | [30] |
| 168 | LI-459A | Pressurizer Level Indicator | On | On | - | [30] |
| 169 | LM-459A | Pressurizer Level | On | On | - | [11] |
| 170 | Rack A4 | CCR Rack A4 | On | On | - | [11] |
| 171 | Rack 19 | Instrument Rack | On | On | - | [11] |
| 172 | Y39 | Terminal Box | Intact | Intact | - | [55] |
| 173 | Y32 | Terminal Box | Intact | Intact | - | [55] |
| 174 | Y36 | Terminal Box | Intact | Intact | - | [55][56] |
| 175 | LIS-1311 | Hydraulic Isolators | Intact | Intact | - | [55][11] |
| 176 | LIS-1312 | Hydraulic Isolators | Intact | Intact | - | [55][11] |
| 177 | Y29 | Terminal Box | Intact | Intact | - | [55][57][58] |
| 178 | PNL SN | Supervisory Panel SN (JB9) | On | On | - | [55] |
| 179 | PT-402 | Pressure Transmitter | On | On | - | [55] |
| 180 | RACK 22 (C9) | Instrument Rack | On | On | - | [55][11] |

| ESEL Item Number | Equipment | | Operating State | | Notes/Comments | References |
|---|---|---|---|---|---|---|
| | ID | Description | Normal State | Desired State | | |
| 181 | RACK 6 (A9) | Instrument Rack | On | On | - | [55][11] |
| 182 | - | TDAFWP Turbine | Standby | Operating | Part of the TDAFWP skid | [7][12][8] |
| 183 | - | TDAFWP Lube Oil Coolers | Standby | Operating | Part of the TDAFWP skid | [7][12][8] |
| 184 | TC-1416-1 | Temperature Converter | On | On | - | [42] |
| 185 | TC-1416-2 | Temperature Converter | On | On | - | [42] |
| 186 | TC-1416-3 | Temperature Converter | On | On | - | [42] |
| 187 | TC-1416-4 | Temperature Converter | On | On | - | [42] |
| 188 | TC-1416-5 | Temperature Converter | On | On | - | [42] |
| 189 | Rack A-7 | CCR Rack A-7 | On | On | - | [42] |
| 190 | FP-T-1 | 31 Fire Water Storage Tank | Intact | Intact | - | [66] |
| 191 | FP-T-2 | 32 Fire Water Storage Tank | Intact | Intact | - | [66] |
| 192 | PW-S-TK | 31 Primary Water Storage Tank | Intact | Intact | - | [11] |
| 193 | Rack B4 | CCR Rack B-4 | On | On | - | [11] |

# ATTACHMENT B – ESEP HCLPF VALUES AND FAILURE MODES TABULATION

| Item No. | Equipment ID | Equipment Description | HCLPF (g) / Screening Level | Failure Mode | Comments |
|---|---|---|---|---|---|
| 1 | MS-45-2 | Steam Generator 32 Safety Relief Valve | >RLGM | Screened | |
| 2 | MS-45-3 | Steam Generator 33 Safety Relief Valve | >RLGM | Screened | |
| 3 | PCV-1135 | ATM Steam Relief Valve 32 Steam Generator | >RLGM | Screened | |
| 4 | PCV-1136 | ATM Steam Relief Valve 33 Steam Generator | >RLGM | Screened | |
| 5 | PNL #1 | ATM Steam Dump Panel #1 | >RLGM | Screened | Note 2 |
| 6 | PNL #2 | ATM Steam Dump Panel #2 | >RLGM | Screened | Note 2 |
| 7 | 32 ABFP | Turbine Driven Auxiliary Feedwater Pump No. 32 | >RLGM | Screened | Note 1 |
| 8 | BFD-PCV-1213 | Pressure Control Valve for Bearing Cooler | >RLGM | Screened | |
| 9 | HCV-1118 | 32 AFW Pump Turbine Governor | >RLGM | Screened | |
| 10 | MS-PCV-1139 | Main Steam to AFW Turbine PCV | >RLGM | Screened | |
| 11 | MS-PCV-1310A | 32 Auxiliary Boiler Feed Pump Steam Supply First Isolation | >RLGM | Screened | |
| 12 | MS-PCV-1310B | 32 Auxiliary Boiler Feed Pump Steam Supply Second Isolation | >RLGM | Screened | |
| 13 | PNL PT2 | Auxiliary Boiler Feed Pump Control Station | >RLGM | Screened | Note 1 |
| 14 | FT-1201 | AFW to SG 32 Flow Transmitter | >RLGM | Screened | |
| 15 | FT-1202 | AFW to SG 33 Flow Transmitter | >RLGM | Screened | |
| 16 | FI-1201 | AFW to SG 32 Flow Indicator | >RLGM | Screened | |
| 17 | FI-1202 | AFW to SG 33 Flow Indicator | >RLGM | Screened | |
| 18 | RACK 26 | Pressure Transmitter Rack #26 | >RLGM | Screened | Note 2 |
| 19 | RACK D-9 | CCR Rack "D9" (NIS MISC Instrument) | >RLGM | Screened | Note 2 |
| 20 | PNL SC Supervisory Panel | Condenser & Feedwater Supervisory Panel | >RLGM | Screened | Note 2 |

| Item No. | Equipment ID | Equipment Description | HCLPF (g) / Screening Level | Failure Mode | Comments |
|---|---|---|---|---|---|
| 21 | BFD-FCV-405B | No. 32 AFW Pump Manual Flow Control to 32 SG | >RLGM | Screened | |
| 22 | BFD-FCV-405C | No. 32 AFW Pump Manual Flow Control to 33 SG | >RLGM | Screened | |
| 23 | LT-427D | SG 32 Level Transmitter | >RLGM | Screened | Note 3 |
| 24 | LT-437D | SG 33 Level Transmitter | >RLGM | Screened | Note 3 |
| 25 | LI-427D | SG 32 Level Indicator | >RLGM | Screened | |
| 26 | LI-437D | SG 33 Level Indicator | >RLGM | Screened | |
| 27 | RACK 21 | Steam Generators Level Transmitter Rack | >RLGM | Screened | Note 3 |
| 28 | PT-429C | SG 32 Steam Pressure Transmitter | >RLGM | Screened | |
| 29 | PT-439C | SG 33 Steam Pressure Transmitter | >RLGM | Screened | |
| 30 | PI-1354 | SG 32 Steam Pressure Indicator | >RLGM | Screened | |
| 31 | PI-1355 | SG 33 Steam Pressure Indicator | >RLGM | Screened | |
| 32 | RACK 9 | Instrument Rack 9 | >RLGM | Screened | Note 2 |
| 33 | CST | Condensate Storage Tank | >RLGM | Screened | Note 1 |
| 34 | LI 1102-S | CST Level Indicator | >RLGM | Screened | |
| 35 | LCV-1158-2 | CST Low Level Control Valve | >RLGM | Screened | |
| 36 | LCV-1158-1 | CST to Condensers Level Control Valve | >RLGM | Screened | |
| 37 | SI-MOV-894A | No. 31 Accumulator Isolation Valve | >RLGM | Screened | Note 3 |
| 38 | SI-MOV-894B | No. 32 Accumulator Isolation Valve | >RLGM | Screened | Note 3 |
| 39 | SI-MOV-894C | No. 33 Accumulator Isolation Valve | >RLGM | Screened | Note 3 |
| 40 | SI-MOV-894D | No. 34 Accumulator Isolation Valve | >RLGM | Screened | Note 3 |
| 41 | 36AMCC | Primary Auxiliary Building Motor Control Center 36A | >RLGM | Screened | Note 1 |

| Item No. | Equipment ID | Equipment Description | HCLPF (g) / Screening Level | Failure Mode | Comments |
|---|---|---|---|---|---|
| 42 | 36BMCC | Primary Auxiliary Building Motor Control Center 36B | >RLGM | Screened | Note 1 |
| 43 | CH-MOV-222 | RCP Seal Water Return Isolation Valve | >RLGM | Screened | |
| 44 | AC-FCV-625 | Thermal Barrier Isolation Valve | >RLGM | Screened | |
| 45 | RWST-31 | Refueling Water Storage Tank | 0.41 | Tank Sloshing | |
| 46 | ACAHRS1 | RHR HTEXCH # 31 | 0.35 | Steel Platform | Note 3 |
| 47 | ACAHRS2 | RHR HTEXCH # 32 | 0.35 | Steel Platform | Note 3 |
| 48 | RCS-SOV-652 | Reactor Head Vent | >RLGM | Screened | Note 3 |
| 49 | RCS-SOV-653 | Reactor Head Vent | >RLGM | Screened | Note 3 |
| 50 | PNL SBF-1 | Supervisory Panel SBF1 | >RLGM | Screened | Note 2 |
| 51 | EHT Panel 34 | Electric Heat Trace Panel 34 | >RLGM | Screened | |
| 52 | 37MCC | Primary Auxiliary Building Motor Control Center 37 | >RLGM | Screened | Note 1 |
| 53 | PNL K49 | 125 VDC Distribution Panel 32A | >RLGM | Screened | Note 2 |
| 54 | PT-1421 | CTMT Pressure Transmitter | >RLGM | Screened | |
| 55 | PR-1421 | CTMT Pressure Recorder | >RLGM | Screened | |
| 56 | TE-1416-1 | Fan 31 Temperature Element | >RLGM | Screened | Note 3 |
| 57 | TE-1416-2 | Fan 32 Temperature Element | >RLGM | Screened | Note 3 |
| 58 | TE-1416-3 | Fan 33 Temperature Element | >RLGM | Screened | Note 3 |
| 59 | TE-1416-4 | Fan 34 Temperature Element | >RLGM | Screened | Note 3 |
| 60 | TE-1416-5 | Fan 35 Temperature Element | >RLGM | Screened | Note 3 |
| 61 | RACK 24A | Instrument Rack | >RLGM | Screened | Note 2 |
| 62 | EDG-31-FO-STNK | Fuel Oil Storage Tank 31 | >RLGM | Screened | Note 2 |

| Item No. | Equipment ID | Equipment Description | HCLPF (g) / Screening Level | Failure Mode | Comments |
|---|---|---|---|---|---|
| 63 | EDG-32-FO-STNK | Fuel Oil Storage Tank 32 | >RLGM | Screened | Note 2 |
| 64 | EDG-33-FO-STNK | Fuel Oil Storage Tank 33 | >RLGM | Screened | Note 2 |
| 65 | 31IB | 118V AC Instrument Bus 31 Channel II | >RLGM | Screened | Note 2 |
| 66 | 32IB | 118V AC Instrument Bus 32 Channel I | >RLGM | Screened | Note 2 |
| 67 | 34IB | 118V AC Instrument Bus 34 Channel III | >RLGM | Screened | Note 2 |
| 68 | 33IB | 118V AC Instrument Bus 33 Channel IV | >RLGM | Screened | Note 2 |
| 69 | 31AIB | 118V AC Instrument Bus 31A Channel II | >RLGM | Screened | Note 2 |
| 70 | 32AIB | 118V AC Instrument Bus 32A Channel I | >RLGM | Screened | Note 2 |
| 71 | 34AIB | 118V AC Instrument Bus 34A Channel III | >RLGM | Screened | Note 2 |
| 72 | 33AIB | 118V AC Instrument Bus 33A Channel IV | >RLGM | Screened | Note 2 |
| 73 | 34 INVERTER | Static Inverter 34 | >RLGM | Screened | Note 1 |
| 74 | 33 INVERTER | Static Inverter 33 | >RLGM | Screened | Note 2 |
| 75 | 31 INVERTER | Static Inverter 31 | >RLGM | Screened | Note 2 |
| 76 | 32 INVERTER | Static Inverter 32 | >RLGM | Screened | Note 2 |
| 77 | 31DP | 125VDC Distribution Panel 31 | >RLGM | Screened | Note 2 |
| 78 | 32DP | 125VDC Distribution Panel 32 | >RLGM | Screened | Note 2 |
| 79 | 33DP | 125VDC Distribution Panel 33 | >RLGM | Screened | Note 2 |
| 80 | 34DP | 125VDC Distribution Panel 34 | >RLGM | Screened | Note 2 |
| 81 | PNL K48 | 125 VDC Distribution Panel 31A | >RLGM | Screened | Note 2 |
| 82 | 31PP | 125VDC Power Panel 31 | >RLGM | Screened | Note 2 |
| 83 | 32PP | 125VDC Power Panel 32 | >RLGM | Screened | Note 2 |

| Item No. | Equipment ID | Equipment Description | HCLPF (g) / Screening Level | Failure Mode | Comments |
|---|---|---|---|---|---|
| 84 | 33PP | 125VDC Power Panel 33 | >RLGM | Screened | Note 2 |
| 85 | 34PP | 125VDC Power Panel 34 | >RLGM | Screened | Note 2 |
| 86 | BATT CHGR 31 | Battery Charger 31 | 0.36 | Anchorage | |
| 87 | BATT CHGR 32 | Battery Charger 32 | 0.36 | Anchorage | |
| 88 | BATT CHGR 33 | Battery Charger 33 | >RLGM | Screened | Note 1 |
| 89 | BATT CHGR 34 | Battery Charger 34 | 0.36 | Anchorage | |
| 90 | BATT 31 | Battery Bank 31 | >RLGM | Screened | Note 1 |
| 91 | BATT 32 | Battery Bank 32 | >RLGM | Screened | Note 1 |
| 92 | BATT 34 | Battery Bank 34 | >RLGM | Screened | Note 2 |
| 93 | BATT 33 | Battery Bank 33 | 0.41 | Anchorage | |
| 94 | BUS2A | 480V(SWGR 31) Bus 2A | >RLGM | Screened | Note 2 |
| 95 | BUS3A | 480V(SWGR 32) Bus 3A | >RLGM | Screened | Note 2 |
| 96 | BUS5A | 480V(SWGR31) Bus 5A | >RLGM | Screened | Note 2 |
| 97 | BUS6A | 480V(SWGR 32) Bus 6A | >RLGM | Screened | Note 2 |
| 98 | 36CMCC | Primary Auxiliary Building Motor Control Center 36C | >RLGM | Screened | Note 2 |
| 99 | 39MCC | Control Building Motor Control Center 39 | >RLGM | Screened | Note 2 |
| 100 | 32MCC | Turbine-Generator Building Motor Control Center 32 | >RLGM | Screened | Note 1 |
| 101 | NI 31B | Source Range Count Rate Meter | >RLGM | Screened | |
| 102 | NI 31D | Source Range Count Rate Meter | >RLGM | Screened | |
| 103 | FE1 | Preamplifier For NE-31 | >RLGM | Screened | Note 3 |

| Item No. | Equipment ID | Equipment Description | HCLPF (g) / Screening Level | Failure Mode | Comments |
|---|---|---|---|---|---|
| 104 | PNL FCF | Flight Control Panel FC | >RLGM | Screened | Note 2 |
| 105 | PI-413K | Loop 31 Hot Leg Pressure Indicator | >RLGM | Screened | |
| 106 | PI-443K | Loop 34 Hot Leg Pressure Indicator | >RLGM | Screened | |
| 107 | PT-413 | Loop 31 Hot Leg Pressure Transmitter | >RLGM | Screened | Note 3 |
| 108 | PT-443 | Loop 34 Hot Leg Pressure Transmitter | >RLGM | Screened | Note 3 |
| 109 | TE-1313 | Upper Tap Compensation Temperature Element | >RLGM | Screened | Note 3 |
| 110 | TE-1314 | Upper Tap Compensation Temperature Element | >RLGM | Screened | Note 3 |
| 111 | TE-1317 | RVWL Conduit Compensation Temperature Element | >RLGM | Screened | Note 3 |
| 112 | TE-1318 | RVWL Conduit Compensation | >RLGM | Screened | Note 3 |
| 113 | TE-1319 | RVWL Lower Tap Capillary Temperature Element | >RLGM | Screened | Note 3 |
| 114 | TE-413A | RCS Loop 31 Hot Leg Wide Range Temperature Element | >RLGM | Screened | Note 3 |
| 115 | TE-423A | RCS Loop 32 Hot Leg Wide Range Temperature Element | >RLGM | Screened | Note 3 |
| 116 | CAB JR9 | RVLIS Cabinet | >RLGM | Screened | Note 2 |
| 117 | LI-1311 | RVWL Narrow Range Indicator | >RLGM | Screened | |
| 118 | LI-1312 | RVWL Wide Range Indicator | >RLGM | Screened | |
| 119 | LT-1311 | Reactor Vessel Level Transmitter Narrow Range | >RLGM | Screened | |
| 120 | LT-1312 | Reactor Vessel Level Transmitter Narrow Range | >RLGM | Screened | |
| 121 | TI-1416 | Containment Atmospheric Temperature Indicator | >RLGM | Screened | |
| 122 | PM-413K | Loop 31 Hot Leg Pressure | >RLGM | Screened | |

| Item No. | Equipment ID | Equipment Description | HCLPF (g) / Screening Level | Failure Mode | Comments |
|---|---|---|---|---|---|
| 123 | 31AIB-2 (J01) | Containment Parameters Recording Cabinet (Channel I) | >RLGM | Screened | Note 2 |
| 124 | PM-443K | Loop 34 Hot Leg Pressure | >RLGM | Screened | |
| 125 | PC-413 | Loop 31 Hot Leg Pressure | >RLGM | Screened | |
| 126 | PC-443 | Loop 34 Hot Leg Pressure | >RLGM | Screened | |
| 127 | PQ-413 | Loop 31 Hot Leg Pressure | >RLGM | Screened | |
| 128 | PQ-443 | Loop 34 Hot Leg Pressure | >RLGM | Screened | |
| 129 | PNL SBF-2 | Supervisory Control Panel SB-2 | >RLGM | Screened | Note 1 |
| 130 | Rack H1 | CCR Auxiliary Panel Analog Rack H1 | 0.47 | Functional | |
| 131 | Rack H3 | CCR Auxiliary Panel Analog Rack H3 | 0.47 | Functional | |
| 132 | PANEL SFF | Supervisory Panel SF | >RLGM | Screened | Note 2 |
| 133 | RVLIS RACK TRAIN A | RVLIS Rack Train A | >RLGM | Screened | Note 2 |
| 134 | MS-45-1 | Steam Generator 31 Safety Relief Valve | >RLGM | Screened | |
| 135 | MS-45-4 | Steam Generator 34 Safety Relief Valve | >RLGM | Screened | |
| 136 | PCV-1134 | ATM Steam Relief Valve 31 Steam Generator | >RLGM | Screened | |
| 137 | PCV-1137 | ATM Steam Relief Valve 34 Steam Generator | >RLGM | Screened | |
| 138 | N2 TANKS | Backup Nitrogen Cylinders | >RLGM | Screened | Note 2 |
| 139 | IA-PCV-1278 | Nitrogen Pressure Regulator | >RLGM | Screened | |
| 140 | IA-PCV-1277 | Nitrogen Pressure Regulator | >RLGM | Screened | |
| 141 | MS-577 | 32 AFW Pump Overspeed Trip & Governor Valve | >RLGM | Screened | |
| 142 | FT-1200 | AFW to SG 31 Flow Transmitter | >RLGM | Screened | |

| Item No. | Equipment ID | Equipment Description | HCLPF (g) / Screening Level | Failure Mode | Comments |
|---|---|---|---|---|---|
| 143 | FT-1203 | AFW to SG 34 Flow Transmitter | >RLGM | Screened | |
| 144 | FI-1200 | AFW to SG 31 Flow Indicator | >RLGM | Screened | |
| 145 | FI-1203 | AFW to SG 34 Flow Indicator | >RLGM | Screened | |
| 146 | BFD-FCV-405A | No. 32 AFW Pump Manual Flow Control to 31 SG | >RLGM | Screened | |
| 147 | BFD-FCV-405D | No. 32 AFW Pump Manual Flow Control to 34 SG | >RLGM | Screened | |
| 148 | LT-417D | SG 31 Level Transmitter | >RLGM | Screened | Note 3 |
| 149 | LT-447D | SG 34 Level Transmitter | >RLGM | Screened | Note 3 |
| 150 | LI-417D | SG 31 Level Indicator | >RLGM | Screened | |
| 151 | LI-447D | SG 34 Level Indicator | >RLGM | Screened | |
| 152 | LQ-417D | Steam Generator Level | >RLGM | Screened | |
| 153 | LQ-427D | Steam Generator Level | >RLGM | Screened | |
| 154 | LQ-437D | Steam Generator Level | >RLGM | Screened | |
| 155 | LQ-447D | Steam Generator Level | >RLGM | Screened | |
| 156 | RACK B10 | Instrument Rack | >RLGM | Screened | Note 1 |
| 157 | RACK B5 | Instrument Rack | >RLGM | Screened | Note 1 |
| 158 | PI-1353 | SG 31 Steam Pressure Indicator | >RLGM | Screened | |
| 159 | PI-1356 | SG 34 Steam Pressure Indicator | >RLGM | Screened | |
| 160 | ACCUM. 31 | Accumulator Tank 31 | >RLGM | Screened | Note 3 |
| 161 | ACCUM. 32 | Accumulator Tank 32 | >RLGM | Screened | Note 3 |
| 162 | ACCUM. 33 | Accumulator Tank 33 | >RLGM | Screened | Note 3 |
| 163 | ACCUM. 34 | Accumulator Tank 34 | >RLGM | Screened | Note 3 |

| Item No. | Equipment ID | Equipment Description | HCLPF (g) / Screening Level | Failure Mode | Comments |
|---|---|---|---|---|---|
| 164 | CH-LCV-459 | Letdown Isolation Valve | >RLGM | Screened | Note 3 |
| 165 | CH-HCV-133 | RHR LP Bypass Valve | >RLGM | Screened | Note 3 |
| 166 | MOV-882 | RHR Pump Suction Isolation Valve | >RLGM | Screened | |
| 167 | LT-459 | Pressurizer Level Transmitter | >RLGM | Screened | Note 3 |
| 168 | LI-459A | Pressurizer Level Indicator | >RLGM | Screened | |
| 169 | LM-459A | Pressurizer Level | >RLGM | Screened | |
| 170 | Rack A4 | CCR Rack A4 | >RLGM | Screened | Note 1 |
| 171 | Rack 19 | Instrument Rack | >RLGM | Screened | Note 3 |
| 172 | Y39 | Terminal Box | >RLGM | Screened | Note 3 |
| 173 | Y32 | Terminal Box | >RLGM | Screened | Note 3 |
| 174 | Y36 | Terminal Box | >RLGM | Screened | Note 3 |
| 175 | LIS-1311 | Hydraulic Isolators | >RLGM | Screened | Note 2 |
| 176 | LIS-1312 | Hydraulic Isolators | >RLGM | Screened | Note 2 |
| 177 | Y29 | Terminal Box | >RLGM | Screened | Note 2 |
| 178 | PNL SN | Supervisory Panel SN (JB9) | >RLGM | Screened | Note 1 |
| 179 | PT-402 | Pressure Transmitter | >RLGM | Screened | Note 3 |
| 180 | RACK 22 (C9) | Instrument Rack | >RLGM | Screened | Note 1 |
| 181 | RACK 6 (A9) | Instrument Rack | >RLGM | Screened | Note 1 |
| 182 | - | TDAFWP Turbine | >RLGM | Screened | |
| 183 | - | TDAFWP Lube Oil Coolers | >RLGM | Screened | |
| 184 | TC-1416-1 | Temperature Converter | >RLGM | Screened | |

| Item No. | Equipment ID | Equipment Description | HCLPF (g) / Screening Level | Failure Mode | Comments |
|---|---|---|---|---|---|
| 185 | TC-1416-2 | Temperature Converter | >RLGM | Screened | |
| 186 | TC-1416-3 | Temperature Converter | >RLGM | Screened | |
| 187 | TC-1416-4 | Temperature Converter | >RLGM | Screened | |
| 188 | TC-1416-5 | Temperature Converter | >RLGM | Screened | |
| 189 | Rack A-7 | CCR Rack A-7 | >RLGM | Screened | Note 1 |
| 190 | FP-T-1 | 31 Fire Water Storage Tank | 0.24 | Anchorage | Modifications required. |
| 191 | FP-T-2 | 32 Fire Water Storage Tank | 0.24 | Anchorage | Modifications required. |
| 192 | PW-S-TK | 31 Primary Water Storage Tank | >RLGM | Screened | Note 1 |
| 193 | Rack B4 | CCR Rack B-4 | >RLGM | Screened | Note 1 |

Notes:

1. Anchorage screened out based on available margin during walkdown by SRT.
2. Anchorage screened out during walkdown validation by SRT.
3. Inaccessible components were walked down during 3R18 outage (March 2015).