



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 25, 2016

Vice President, Operations
Entergy Nuclear Operations, Inc.
Indian Point Energy Center
450 Broadway, GSB
P.O. Box 249
Buchanan, NY 10511-0249

**SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT NO. 2 - REPORT FOR THE
ONSITE AUDIT REGARDING IMPLEMENTATION OF MITIGATING
STRATEGIES AND RELIABLE SPENT FUEL INSTRUMENTATION RELATED
TO ORDERS EA-12-049 AND EA-12-051 (CAC NOS. MF0744 AND MF0737)**

Dear Sir or Madam:

On March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design-Basis External Events" and Order EA-12-051, "Order to Modify Licenses With Regard To Reliable Spent Fuel Pool Instrumentation," (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML12054A736 and ML12054A679, respectively). The orders require holders of operating reactor licenses and construction permits issued under Title 10 of the *Code of Federal Regulations* Part 50 to submit for review, Overall Integrated Plans (OIPs) including descriptions of how compliance with the requirements of Attachment 2 of each order will be achieved.

By letter dated February 28, 2013 (ADAMS Accession No. ML13079A348), Entergy Nuclear Operations, Inc. (Entergy, the licensee) submitted its OIP for Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point Unit 2 and Unit 3) in response to Order EA-12-049. By letters dated August 27, 2013, February 27, 2014, August 27, 2014, February 27, 2015, and August 28, 2015 (ADAMS Accession Nos. ML13247A032, ML14070A365, ML14251A227, ML15069A028, and ML15246A119, respectively), Entergy submitted its first five six-month updates to the OIP. By letter dated August 28, 2013 (ADAMS Accession No. ML13234A503), the NRC notified all licensees and construction permit holders that the staff is conducting audits of their responses to Order EA-12-049 in accordance with NRC Office of Nuclear Reactor Regulation (NRR) Office Instruction LIC-111, "Regulatory Audits" (ADAMS Accession No. ML082900195). This audit process led to the issuance of the Indian Point Units 2 and 3 interim staff evaluation (ISE) (ADAMS Accession No. ML13337A594) and the Indian Point Unit 3 onsite audit report (ADAMS Accession No. ML14335A642) and continues with in-office and onsite portions of this audit.

By letter dated February 27, 2013 (ADAMS Accession No. ML13072A082), the licensee submitted its OIP for Indian Point Units 2 and 3 in response to Order EA-12-051. By letter dated June 25, 2013 (ADAMS Accession No. ML13169A127), the NRC staff sent a request for additional information (RAI) to the licensee. By letters dated August 20, 2013, August 27, 2013, February 27, 2014, August 27, 2014, February 27, 2015, and August 28, 2015 (ADAMS Accession Nos. ML13239A238, ML13247A031, ML14070A447, ML14251A226, ML15065A123,

and ML15251A235, respectively), the licensee submitted its RAI responses and first five six-month updates to the OIP. The NRC staff's review led to the issuance of the Indian Point Units 2 and 3 ISE and RAI dated November 8, 2013 (ADAMS Accession No. ML13298A805). By letter dated March 26, 2014 (ADAMS Accession No. ML14083A620), the NRC notified all licensees and construction permit holders that the staff is conducting in-office and onsite audits of their responses to Order EA-12-051 in accordance with NRC NRR Office Instruction LIC-111, as discussed above.

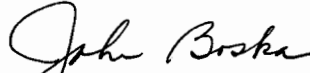
The ongoing audit process, to include the in-office and onsite portions, allows the staff to assess whether it has enough information to make a safety evaluation of the Integrated Plans. The audit allows the staff to review open and confirmatory items from the mitigation strategies ISE, RAI responses from the spent fuel pool instrumentation (SFPI) ISE, the licensee's integrated plans, and other audit questions. Additionally, the staff gains a better understanding of submitted and updated information, audit information provided on ePortals, and preliminary Overall Program Documents/Final Integrated Plans while identifying additional information necessary for the licensee to supplement its plan and address staff potential concerns.

In support of the ongoing audit of the licensee's OIPs, including the supplements, the NRC staff conducted an onsite audit at Indian Point Unit 2 from November 30 to December 3, 2015, per the audit plan dated October 30, 2015 (ADAMS Accession No. ML15301A093). The purpose of the onsite portion of the audit was to provide the NRC staff the opportunity to continue the audit review and gain key insights most easily obtained at the plant as to whether the licensee is on a successful path for compliance with the Mitigation Strategies and SFPI orders. The onsite activities included detailed analysis and calculation discussions, walk-throughs of strategies and equipment laydown, visualization of portable equipment storage and deployment, review of staging and deployment of offsite equipment, and review of installation details for SFPI equipment. During the previous NRC onsite audit for Indian Point Unit 3 in October 2014, the staff reviewed items that were applicable to Indian Point Unit 3. However, some of those audit items, such as storage of the Mitigation Strategies equipment, are applicable to both units. A review of the common audit items was not repeated during the Indian Point Unit 2 onsite audit. Refer to the Indian Point Unit 3 onsite audit report (ADAMS Accession No. ML14335A642) for those items. Due to the timing of the refueling outages, Unit 3 was required to achieve compliance with the Mitigation Strategies and SFPI orders in spring 2015, while the Unit 2 compliance date is at the end of the spring 2016 refueling outage.

The enclosed audit report provides a summary of the activities for the onsite audit portion. Additionally, this report contains an attachment listing all open audit items for Indian Point Unit 2 currently under NRC staff review.

If you have any questions, please contact me at 301-415-2901 or by e-mail at John.Boska@nrc.gov.

Sincerely,

A handwritten signature in black ink that reads "John Boska". The signature is written in a cursive style with a large, looping initial "J".

John Boska, Senior Project Manager
Orders Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No.: 50-247

Enclosure:
Audit report

cc w/encl: Distribution via Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

AUDIT REPORT BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO ORDERS EA-12-049 AND EA-12-051 MODIFYING LICENSES
WITH REGARD TO REQUIREMENTS FOR
MITIGATION STRATEGIES FOR BEYOND-DESIGN-BASIS EXTERNAL EVENTS
AND RELIABLE SPENT FUEL POOL INSTRUMENTATION
ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2
DOCKET NO. 50-247

BACKGROUND AND AUDIT BASIS

On March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design-Basis External Events" and Order EA-12-051, "Order to Modify Licenses With Regard To Reliable Spent Fuel Pool Instrumentation," (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML12054A736 and ML12054A679, respectively). Order EA-12-049 directs licensees to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling capabilities in the event of a beyond-design-basis external event (BDBEE). Order EA-12-051 requires, in part, that all operating reactor sites have a reliable means of remotely monitoring wide-range SFP levels to support effective prioritization of event mitigation and recovery actions in the event of a BDBEE. The orders require holders of operating reactor licenses and construction permits issued under Title 10 of the *Code of Federal Regulations* Part 50 to submit for review, Overall Integrated Plans (OIPs) including descriptions of how compliance with the requirements of Attachment 2 of each order will be achieved.

By letter dated February 28, 2013 (ADAMS Accession No. ML13079A348), Entergy Nuclear Operations, Inc. (Entergy, the licensee) submitted its OIP for Indian Point Nuclear Generating Unit Nos. 2 and 3 (Indian Point Unit 2 and Unit 3) in response to Order EA-12-049. By letters dated August 27, 2013, February 27, 2014, August 27, 2014, February 27, 2015, and August 28, 2015 (ADAMS Accession Nos. ML13247A032, ML14070A365, ML14251A227, ML15069A028, and ML15246A119, respectively), Entergy submitted its first five six-month updates to the OIP. By letter dated August 28, 2013 (ADAMS Accession No. ML13234A503), the NRC notified all licensees and construction permit holders that the staff is conducting audits

Enclosure

of their responses to Order EA-12-049 in accordance with NRC Office of Nuclear Reactor Regulation (NRR) Office Instruction LIC-111, "Regulatory Audits" (ADAMS Accession No. ML082900195). This audit process led to the issuance of the Indian Point Units 2 and 3 interim staff evaluation (ISE) (ADAMS Accession No. ML13337A594) and the Indian Point Unit 3 onsite audit report (ADAMS Accession No. ML14335A642) and continues with in-office and onsite portions of this audit.

By letter dated February 27, 2013 (ADAMS Accession No. ML13072A082), the licensee submitted its OIP for Indian Point Units 2 and 3 in response to Order EA-12-051. By letter dated June 25, 2013 (ADAMS Accession No. ML13169A127), the NRC staff sent a request for additional information (RAI) to the licensee. By letters dated August 20, 2013, August 27, 2013, February 27, 2014, August 27, 2014, February 27, 2015, and August 28, 2015 (ADAMS Accession Nos. ML13239A238, ML13247A031, ML14070A447, ML14251A226, ML15065A123, and ML15251A235, respectively), the licensee submitted its RAI responses and first five six-month updates to the OIP. The NRC staff's review led to the issuance of the Indian Point Units 2 and 3 ISE and RAI dated November 8, 2013 (ADAMS Accession No. ML13298A805). By letter dated March 26, 2014 (ADAMS Accession No. ML14083A620), the NRC notified all licensees and construction permit holders that the staff is conducting in-office and onsite audits of their responses to Order EA-12-051 in accordance with NRC NRR Office Instruction LIC-111, as discussed above.

The ongoing audit process, to include the in-office and onsite portions, allows the staff to assess whether it has enough information to make a safety evaluation of the Integrated Plans. The audit allows the staff to review open and confirmatory items from the mitigation strategies ISE, RAI responses from the spent fuel pool instrumentation (SFPI) ISE, the licensee's integrated plans, and other audit questions. Additionally, the staff gains a better understanding of submitted and updated information, audit information provided on ePortals, and preliminary Overall Program Documents (OPDs)/Final Integrated Plans (FIPs) while identifying additional information necessary for the licensee to supplement its plan and address staff potential concerns.

In support of the ongoing audit of the licensee's OIPs, including the supplements, the NRC staff conducted an onsite audit at Indian Point Unit 2 from November 30 to December 3, 2015, per the audit plan dated October 30, 2015 (ADAMS Accession No. ML15301A093). The purpose of the onsite portion of the audit was to provide the NRC staff the opportunity to continue the audit review and gain key insights most easily obtained at the plant as to whether the licensee is on a successful path for compliance with the Mitigation Strategies and SFPI orders. The onsite activities included detailed analysis and calculation discussions, walk-throughs of strategies and equipment laydown, visualization of portable equipment storage and deployment, review of staging and deployment of offsite equipment, and review of installation details for SFPI equipment. During the previous NRC onsite audit for Indian Point Unit 3 in October 2014, the staff reviewed items that were applicable to Indian Point Unit 3. However, some of those audit items, such as storage of the Mitigation Strategies equipment, are applicable to both units. A review of the common audit items was not repeated during the Indian Point Unit 2 onsite audit. Refer to the Indian Point Unit 3 onsite audit report (ADAMS Accession No. ML14335A642) for those items. Due to the timing of the refueling outages, Unit 3 was required to achieve compliance with the Mitigation Strategies and SFPI orders in spring 2015, while the Unit 2 compliance date is at the end of the spring 2016 refueling outage.

Following the licensee's declarations of order compliance, the NRC staff will evaluate the OIPs, as supplemented; the resulting site-specific OPDs/FIPs; and, as appropriate, other licensee submittals based on the requirements in the orders. For Order EA-12-049, the staff will make a safety determination using the Nuclear Energy Institute (NEI) developed guidance document NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide" issued in August 2012 (ADAMS Accession No. ML12242A378), as endorsed by NRC Japan Lessons-Learned Directorate (JLD) interim staff guidance (ISG) JLD-ISG-2012-01 "Compliance with Order EA-12-049, 'Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events'" (ADAMS Accession No. ML12229A174). For Order EA-12-051, the staff will make a safety determination using the NEI developed guidance document NEI 12-02, Revision 1, "Industry Guidance for Compliance with NRC Order EA-12-051, 'To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation'" (ADAMS Accession No. ML12240A307), as endorsed, with exceptions and clarifications, by NRC ISG JLD-ISG-2012-03 "Compliance with Order EA-12-051, 'Reliable Spent Fuel Pool Instrumentation'" (ADAMS Accession No. ML12221A339) as providing one acceptable means of meeting the order requirements. Should the licensee propose an alternative strategy for compliance, additional staff review will be required to evaluate the alternative strategy in reference to the applicable order.

AUDIT ACTIVITIES

The onsite audit was conducted at Indian Point Unit 2 from November 30, 2015, through December 3, 2015. The NRC audit team staff was as follows:

Title	Team Member	Organization
Team Lead/Project Manager	John Boska	NRR/JLD
Technical Support – Electrical	Kerby Scales	NRR/JLD
Technical Support – Reactor Systems	Joshua Miller	NRR/JLD
Technical Support – Balance of Plant	On Yee	NRR/JLD
Technical Support – I&C	Khoi Nguyen	NRR/JLD

The NRC staff executed the onsite portion of the audit per the three part approach discussed in the October 30, 2015, plan, to include conducting a tabletop discussion of the site's integrated mitigating strategies (MS) compliance program, a review of specific technical review items, and discussion of specific program topics. Activities that were planned to support the above included detailed analysis and calculation discussions, walk-throughs of strategies and equipment laydown, visualization of portable equipment storage and deployment, staging and deployment of offsite equipment, and physical sizing and placement of SFPI equipment.

AUDIT SUMMARY

1.0 Entrance Meeting (November 30, 2015)

At the audit entrance meeting, the NRC staff audit team introduced itself followed by introductions from the licensee's staff. The NRC audit team provided a brief overview of the audit's objectives and anticipated schedule.

2.0 Integrated Mitigating Strategies Compliance Program Overview

Per the audit plan and as an introduction to the site's program, the licensee provided a presentation to the NRC audit team describing the site's strategies to meet the NRC orders. The licensee reviewed its strategy for Unit 2 to maintain core cooling, containment, and SFP cooling in the event of a BDBEE, and the plant modifications being done in order to implement the strategies. Also reviewed was the interface with the National Strategic Alliance for FLEX Emergency Response (SAFER) Response Centers including staging areas, the spent fuel pool level indication modification, the modifications planned to enhance emergency communications, preventative maintenance plans for the FLEX equipment, procedural enhancements such as development of FLEX support guidelines (FSGs), and operator training.

3.0 Onsite Audit Technical Discussion Topics

Based on the audit plan, and with a particular emphasis on the Part 2 "Specific Technical Review Items," the NRC staff technical reviewers conducted interviews with licensee technical staff, site walk-downs, and detailed document review for the items listed in the plan. Results of these technical reviews and any additional review items needed from the licensee are documented in the audit item status table in Attachment 3, as discussed in the Conclusion section below.

3.1 Reactor Systems Technical Discussions and Walk-Downs

The NRC staff met with licensee staff to discuss the amount of leakage from the Unit 2 reactor coolant pump (RCP) seals, the timing of the injection of borated water into the reactor coolant system, and the mixing of that water during natural circulation conditions. The licensee has decided to install orifices in the RCP number one seal leakoff line on all four RCPs to restrict the leakage flow. The NRC staff reviewed the flow calculation and had questions for the licensee. The NRC staff determined that the amount of leakage from the RCP seals needed to be finalized, and that would affect the other parameters.

3.2 Electrical Technical Discussions and Walk-Downs

a. The NRC staff reviewed the calculations on extending battery life based on load shedding, and walked down the battery rooms to evaluate strategies for hydrogen and temperature control. NRC staff also walked down panels used for load shedding to evaluate feasibility and timing.

b. The NRC staff walked down connection points and locations for FLEX electrical generators. In order to provide electrical power, the plan is to move a 480v, 600kw, FLEX generator from the FLEX equipment storage building (FESB) to the transformer yard, and run temporary cables inside the control building to a new panel which will allow energizing the 480v safety buses. An alternate location has been identified in case the transformer yard is not accessible. The staff reviewed the licensee's load and sizing calculations for the FLEX generators.

3.3 SFPI Technical Discussions and Walk-Downs

The NRC staff walked down the location of the level sensors in the Unit 2 spent fuel pool (SFP) and the cable runs from the sensors to the electronics in the Unit 2 fan house where the operators will read the level indication.

3.4 Other Technical Discussion Areas and Walk-Downs

a. The NRC staff met with licensee staff to discuss the required robust source of water for the turbine-driven auxiliary feedwater (TDAFW) pump. The normal supply from the condensate storage tank (CST) was previously noted in the NRC's ISE to be susceptible to tornado-borne missiles. The licensee performed tornado analyses in order to credit using the water supply from the city water tank, which is already piped to the suction of the TDAFW pump but must be locally aligned. Although the city water tank is not protected from tornado-borne missiles, the separation from the CST is sufficient to credit the survival of one of the tanks. The staff walked down the physical locations of the CST and the city water tank, and reviewed the tornado analyses. The use of tank separation rather than a fully robust tank is an alternative to NEI 12-06.

b. The NRC staff met with licensee staff to discuss the required robust source of borated water for RCS make-up. The current licensing basis for Unit 2 does not include tornado protection for the design of the refueling water storage tank (RWST). The licensee performed analyses in order to credit using the borated water supply from either the Unit 2 or Unit 3 RWST to support its FLEX strategies for both units. Although the Unit 2 and Unit 3 RWSTs are not designed to withstand impact from tornado-borne missiles, the separation and intervening structures between the Unit 2 and Unit 3 RWSTs is sufficient to credit the survival of one of the tanks. The staff walked down the physical locations of both RWSTs, and reviewed the associated analyses. The use of tank separation and intervening structures rather than a fully robust tank is an alternative to NEI 12-06.

c. The NRC staff walked down the FLEX strategies for core cooling, RCS inventory, and SFP inventory functions. This included the point of deployment for the portable FLEX pumps, hose routing and deployment connection points (primary and alternate).

d. The NRC staff walked down the access points to the safety-related fuel oil storage tanks (FOSTs), which will be the source of the diesel fuel used to refuel the FLEX equipment. Staff walked down the refueling paths to be used by the refueling trailer.

e. The licensee's cooldown strategy relies on operation of the steam generator (SG) atmospheric dump valves (ADV). The NRC staff noted that the licensee would need to align a supply of bottled nitrogen gas to provide the motive force for ADV operation. The NRC staff reviewed the procedures and actions needed to align the bottled nitrogen gas.

4.0 Exit Meeting (December 3, 2015)

The NRC staff audit team conducted an exit meeting with licensee staff following the closure of onsite audit activities. The NRC staff highlighted items reviewed and noted that the results of the onsite audit trip will be documented in this report. The following open items were discussed at the exit meeting (see Attachment 3 for additional information):

- a. ISE CI 3.2.1.6.A, Prevent Nitrogen Injection Into the RCS
The NRC staff needs further information on the licensee's plans to isolate the accumulators to prevent the injection of nitrogen gas into the RCS, which could impede the natural circulation cooling.
- b. ISE CI 3.2.1.8.A, RCS Boration for Reactivity Control
The NRC staff is reviewing the licensee's plan to increase the soluble boron in the RCS in order to ensure the reactor remains subcritical.
- c. ISE CI 3.2.3.A, Containment Evaluation
The calculation of the conditions inside the containment building was done by the licensee with an assumption of an initial leak rate of 21 gallons per minute (gpm) seal leakage per RCP. As the RCP seal leakage model has not been accepted yet by the NRC staff, it is not possible to perform a final evaluation of this calculation.
- d. AQ-46, Battery Room Temperature Extremes
The NRC staff needs additional information to evaluate the performance of the plant batteries considering the temperature extremes (hot and cold) that may be reached in the battery rooms.
- e. SFPI RAI-3, Seismic Qualification of SFP Level Instruments
The NRC staff needs additional information on the seismic qualification of plant mountings for the new SFP level instrument electronics.
- f. SFPI RAI-4, Seismic Qualification Methodology
The NRC staff needs more information on the methodology used for the seismic qualification of the new SFP level instrument electronics.
- g. SE #5, Accuracy of the NOTRUMP Computer Code
Westinghouse used the NOTRUMP computer code to develop certain timelines for operator actions in an extended loss of alternating current (ac) power (ELAP) event (see WCAP-17601-P for example). The NRC simulations using the TRACE code indicate some differences, which may be significant enough to affect the timeline for operator actions. The Pressurized-Water Reactor Owners Group (PWROG) is working with the NRC on a resolution, which may be applicable to all PWRs. The NRC staff also needs a comparison chart from the licensee to compare how the plant parameters assumed in the Westinghouse analyses compare to Indian Point parameters.

- h. SE #13, RCP Seal Leakage Rates
The NRC staff needs information to demonstrate that the current RCP seal leakage rate calculation is accurate or conservative.
- i. SE #14, Pressurization of the RCP #1 Seal Leakoff Line
The NRC staff has asked the licensee to determine the expected maximum pressure in the #1 seal leakoff line during this event and to demonstrate that the components of this line will not fail in such a manner that will increase the seal leakage.

CONCLUSION

The NRC staff completed all three parts of the October 30, 2015, onsite audit plan. Each audit item listed in Part 2 of the plan was reviewed by NRC staff members while on site. In addition to the list of NRC and licensee onsite audit staff participants in Attachment 1, Attachment 2 provides a list of documents reviewed during the onsite audit portion.

In support of the continuing audit process as the licensee proceeds towards orders compliance for this site, Attachment 3 provides the status of all open audit review items that the NRC staff is evaluating in anticipation of issuance of a combined safety evaluation for both the Mitigation Strategies and Spent Fuel Pool Instrumentation orders. The five sources for the audit items referenced below are as follows:

- a. Interim Staff Evaluation (ISE) Open Items (OIs) and Confirmatory Items (CIs)
- b. Audit Questions (AQs)
- c. Licensee-identified Overall Integrated Plan (OIP) Open Items (OIs)
- d. SFPI Requests for Additional Information (RAIs)
- e. Additional information needed to support the Safety Evaluation (SE)

The attachments provide audit information as follows:

- a. Attachment 1: List of NRC staff and licensee staff audit participants
- b. Attachment 2: List of documents reviewed during the onsite audit
- c. Attachment 3: MS/SFPI SE Audit Items currently under NRC staff review (licensee input needed as noted)

While this report notes the completion of the onsite portion of the audit per the audit plan dated October 30, 2015, the ongoing audit process continues as per the letters dated August 28, 2013, and March 26, 2014, to all licensees and construction permit holders for both orders.

Additionally, while Attachment 3 provides a list of currently open items, the status and progress of the NRC staff's review may change based on licensee plan changes, resolution of generic

issues, and other NRC staff concerns not previously documented. Changes in the NRC staff review will be communicated in the ongoing audit process.

Attachments:

1. NRC and Licensee Staff Onsite Audit Participants
2. Onsite Audit Documents Reviewed
3. MS/SFPI Audit Items currently under NRC staff review

Onsite Audit Participants

NRC Staff:

John Boska	NRR/JLD/JOMB
On Yee	NRR/JLD/JCBB
Joshua Miller	NRR/JLD/JERB

Khoi Nguyen	NRR/JLD/JERB
Kerby Scales	NRR/JLD/JERB

Indian Point Staff:

Steve Prussman	Regulatory Affairs
John Ferrick	Production Manager
Walt Wittich	FLEX Strategy Technical Lead
John Hill	I&C Design Engineering Supervisor
Lori Glander	Emergency Preparedness Manager
Brian Sullivan	Superintendent, Operations Training
Tom Gander	FLEX Implementation Team
Virginia Conrad	FLEX Implementation Team
Juan Pineda	FLEX Implementation Team
Dave Powell	Operations
Thomas Alexander	Operations
Michael Rhu	Operations
Kristina Alheri	Engineering
William Mahlmiester	Engineering
Leon Mavridis	Engineering
W. Schmidt	Contractor, Absolute Consulting
Carol Morrissey	Contractor, Absolute Consulting

Documents Reviewed

- IP-RPT-14-00006, Rev. 0, IP2 FLEX Strategy Development
- Engineering Change EC 50151, FLEX Coping Strategies
- Engineering Change EC 50865, IP2 SFP Level Instrumentation
- FEX-00063-00, Rev. 0, Determination of Hydrogen Evolution For 125 VDC Batteries 21, 22, 23, AND 24
- IP-CALC-14-00035, Rev. 0, Battery Room 21, 22, 23, 24 Hydrogen Generation For FLEX Event
- IP-CALC-14-00036, Nitrogen Backup to AFW Valves and Atmospheric Dump Valves for FLEX Event – IPEC 2
- IP-CALC-14-00037, Rev. 0, FLEX Event Diesel Fuel Usages
- IP-CALC-14-00038, Rev. 0, Main Control Room Heat-up for FLEX Event (IP2)
- IP-CALC-14-00039, FLEX Event Evaluation of Turbine Driven Auxiliary Feed Pump Room Heat-up
- IP-CALC-14-00041, Rev 0.
- IP-CALC-14-00042, Rev 0, IP2 MAAP 4.0.5.Containment Analysis for an ELAP.
- IP-CALC-14-00043, Rev 0, Freezing of Unit 2 Coolant Sources for FLEX Event
- IP-CALC-14-00044 – IP2 RCS Inventory Evaluation for FLEX
- IP-CALC-14-00045 – Steam Generator and SFP Inventory Evaluation for FLEX (IP2 only)
- IP-CALC-14-00046, Rev 0, Hydraulic Model for Condensate Storage Tank for FLEX Strategies (IP2 only)
- IP-CALC-14-00047, Rev 0, Hydraulic Analysis of FLEX Strategies using the RWST as a Source of Water (IP2 only)
- IP-CALC-14-00048 – Hydraulic Model for the Primary Water Storage Tank (PWST) and the Fire Water Storage Tank (FWST) for FLEX strategies (IP2)
- IP-CALC-13-00055 - Hydraulic Model for the Primary Water Storage Tank (PWST) and the Fire Water Storage Tank (FWST) for FLEX strategies (IP3)
- IP-CALC-14-00055, Rev 0, IP2 FLEX Phase II Portable Diesel Generator Sizing Calculation
- IP-CALC-14-00056, Rev. 0: IP2 FLEX Phase 3 Portable Diesel Generator (PDG) Sizing/Motor Starting and Phase 2 PDG Motor Starting Calculation
- IP-CALC-14-00076, Rev. 0, Battery Sizing and Voltage Drop Calculation for Extended Loss of AC Power (ELAP)
- IP-CALC-14-00086, Rev 0, Spent Fuel Pool Level Instrumentation Conduit Support
- IP-CALC-14-00087, Rev 0, Unit 2 Spent Fuel Pool Instrumentation Mounting Bracket
- IP-CALC-14-00088, Rev 0, Unit 2 SFPI Environmental Parameters
- IP-CALC-14-00089, Rev 0, Freezing Evaluation for Pipes for BDBEE (Indian Point Unit 2)
- IP-CALC-15-00002, Rev 0
- FCX-00102, Rev 0, Operability Analysis of Hydrogen Recombiner Cabinets in the Fan House at Elevation 92

- ENTGIP2-RPT-001 Rev. 2 - Project Report For Entergy Nuclear Northeast Indian Point 2 - IP2 Tornado Protection
- IP-CALC-13-00087, Determination of the Time to Boil in Indian Point Units 2 and 3 Spent Fuel Pools after an Earthquake, Rev. 0
- Drawing A208088 (Incorporated EC-19221), Rev. 44, 480 VAC. SWGRS. 21 & 22, Bus 2A, 3A, 5A, & 6A (FLEX Phase 3)
- Drawing A208501, Rev. 41, One Line Diagram 125 VDC For Dist Panels 21, 21A, 21B, 22, and 22A
- Drawing 250907 (Incorporated EC-50161), Rev. 34, Electrical Distribution and Transmission System (FLEX Phase 3)
- Drawing 9321-F-3006, Rev 98, Single Line Diagram 480V MCC 26A and 26B
- Drawing 9321-F-3007, Rev. 18, Three Line Diagram Diesel Generator Low Voltage (FLEX Phase 2)
- Drawing 9321-F-3008, Rev 92, Single Line Diagram D.C. Power Panels 21, 22, 23, and 24
- SAFER Response Plan for Indian Point Energy Center, Rev 3, 2/26/15, AREVA document No. 38-9233746-000.
- 0-FSG-100, BDBEE/ELAP Emergency Response (draft)
- 0-FSG-101, BDBEE/EP Communications (draft)
- 0-FSG-201, Rev 0, Staging FLEX Equipment
- 0-FSG-202, Rev 0, Refueling FLEX Equipment
- 2-ECA-0.0, Loss of All AC Power (draft)
- 2-FSG-001, Long Term RCS Inventory Control (draft)
- 2-FSG-002, Alternate Aux Feedwater Suction Source (draft)
- 2-FSG-003, Alternate Low Pressure Feedwater (draft)
- 2-FSG-004, ELAP DC Bus Load Shed/Management (draft)
- 2-FSG-005, Initial Assessment and FLEX Equipment Staging (draft)
- 2-FSG-006, Alternate CST Makeup, (draft)
- 2-FSG-007, Loss of Vital Instrumentation or Control Power (draft)
- 2-FSG-008, Alternate RCS Boration (draft)
- 2-FSG-009, Low Decay Heat Temperature Control (draft)
- 2-FSG-010, Passive RCS Injection Isolation (draft)
- 2-FSG-011, Alternate Spent Fuel Pool Makeup and Cooling (draft)
- 2-FSG-014, Extended Loss of AC Power – Phase 3 (draft)
- 2-IC-SI-87, Rev. 1, Contingency Action to Provide Instrumentation Information During Loss of Power

Mitigation Strategies/Spent Fuel Pool Instrumentation Safety Evaluation Audit Items:

Audit Items Currently Under NRC Staff Review, Requiring Licensee Input As Noted

Audit Item Reference	Item Description	Licensee Input Needed
ISE CI 3.2.1.6.A	Prevent Nitrogen Injection Into the RCS	The NRC staff needs further information on the licensee's plans to isolate the accumulators to prevent the injection of nitrogen gas into the RCS, which could impede the natural circulation cooling.
ISE CI 3.2.1.8.A	RCS Boration for Reactivity Control	No input needed at this time. The NRC staff is reviewing the licensee's plan to increase the soluble boron in the RCS in order to ensure the reactor remains subcritical.
ISE CI 3.2.3.A	Containment Evaluation	The calculation of the conditions inside the containment building was done by the licensee with an assumption of an initial leak rate of 21 gallons per minute (gpm) seal leakage per RCP. As the RCP seal leakage model has not been accepted yet by the NRC staff, it is not possible to perform a final evaluation of this calculation.
AQ-46	Battery Room Temperature Extremes	The NRC staff requested the licensee to provide a technical basis to support the conclusion that the battery rooms would not be exposed to extreme high and low temperatures during the first phase of the ELAP event.
SFPI RAI-3	Seismic Qualification of SFP Level Instruments	The NRC staff needs additional information on the seismic qualification of plant mountings for the new SFP level instrument electronics.

Audit Item Reference	Item Description	Licensee Input Needed
SFPI RAI-4	Seismic Qualification Methodology	The NRC staff needs more information on the methodology used for the seismic qualification of the new SFP level instrument electronics.
SE #5	Accuracy of the NOTRUMP Computer Code: Westinghouse used the NOTRUMP computer code to develop certain timelines for operator actions in an ELAP event (see WCAP-17601-P for example). NRC simulations using the TRACE code indicate some differences, which may be significant enough to affect the timeline for operator actions. The PWROG is working with the NRC on a resolution, which may be applicable to all PWRs.	Provide PWROG resolution on accuracy of the NOTRUMP code. Provide a comparison chart to compare how the plant parameters assumed in the Westinghouse analyses compare to Indian Point parameters.
SE #13	RCP Seal Leakage Rates	The NRC staff needs information to demonstrate that the current RCP seal leakage rate calculation is accurate or conservative.
SE #14	Pressurization of the RCP #1 Seal Leakoff Line	The NRC staff has asked the licensee to determine the expected maximum pressure in the #1 seal leakoff line during this event and to demonstrate that the components of this line will not fail in such a manner that will increase the seal leakage.

If you have any questions, please contact me at 301-415-2901 or by e-mail at John.Boska@nrc.gov.

Sincerely,

/RA/

John Boska, Senior Project Manager
Orders Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No.: 50-247

Enclosure:
Audit report

cc w/encl: Distribution via Listserv

DISTRIBUTION:

PUBLIC
JOMB R/F
RidsNrrDorLpl1-1 Resource
RidsNrrPMIndianPoint Resource
RidsNrrLASLent Resource
RidsAcrsAcnw_MailCTR Resource

RidsRgn1MailCenter Resource
JBoska, NRR
GBowman, NRR
LGibson, NRR
AProffitt, NRR

ADAMS Accession No. ML16042A388

***Via email**

OFFICE	NRR/JLD/JOMB/PM	NRR/JLD/LA	NRR/JLD/JCBB/BC*	NRR/JLD/JERB/BC*
NAME	JBoska	SLent	SBailey	JQuichocho
DATE	02/12/16	02/11/16	02/16/16	02/17/16
OFFICE	NRR/JLD/JOMB/BC*	NRR/JLD/JOMB/PM		
NAME	GBowman	JBoska		
DATE	2/24/2016	2/25/2016		

OFFICIAL RECORD COPY