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Ron Gaston
Director, Nuclear Licensing

10 CFR 50.90

NL-19-093

November 21, 2019

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Proposed Technical Specifications (TS) Changes – Indian Point Nuclear Generating Unit 3 TS SR 3.7.7.2 and TS 3.7.6, Required Action A.1

Indian Point Nuclear Generating Unit 3
NRC Docket Nos. 50-286
Renewed Facility Operating License No. DPR-64

Reference:

1. Entergy Nuclear Operations, Inc. (Entergy) letter to U.S. Nuclear Regulatory Commission (NRC), "Proposed Change to Technical Specifications Regarding City Water Tank Surveillance Requirements," dated June 24, 2002 (Letter IPN-02-050) (ADAMS Accession No. ML021860222)

2. Entergy letter to NRC, "City Water Surveillance Requirement," dated June 23, 2003 (Letter NL-03-104) (ADAMS Accession No. ML031780019)

3. NRC Letter to Entergy , "Indian Point Nuclear Generating Unit No. 3 - Issuance of Amendment Re: City Water Tank (TAC NO. ME35506)," dated August 4, 2003 (ADAMS Accession No. ML032160069)

Dear Sir or Madam:

In accordance with Title 10 of the Code of Federal Regulations (CFR) Part 50, Section 50.90, "Application for amendment of license, construction permit, or early site permit," Entergy Nuclear Operations, Inc. (Entergy) is proposing an amendment to Renewed Facility Operating License DPR-64, Appendix A, Technical Specifications (TS) for Indian Point Nuclear Generating Unit 3 (IP3).

In Reference 1, as supplemented by Reference 2, Entergy requested a change to the IP3 TS 3.7.7, "City Water" (CW) Surveillance Requirements (SRs). The change proposed for TS SR 3.7.7.2 included position verification of two additional valves resulting from a modification that added a backflow preventer, and inlet and outlet isolation valves, to the CW header supply line to the Auxiliary Feedwater (AFW) Pumps. The proposed change was subsequently approved in Reference 3 under Amendment 218.

The basis for the current proposed amendment is to stop CW intrusion into the AFW System and Condensate Storage Tank (CST) due to leak-by past a downstream isolation valve. This leak-by has created water chemistry concerns, particularly for the Steam Generators (SGs), for which the CST is the preferred water source. The proposed changes would also allow removal of a temporary modification that provides continuous flushing of the 33 AFW pump suction line, associated with the valve leak-by, to alleviate water chemistry concerns.

Due to these continuing concerns related to CW intrusion into the AFW system and the CST, this request proposes changes to TS SR 3.7.7.2 to allow one of the backflow preventer isolation valves on the IP3 CW Header Supply to be maintained closed when in the Modes of Applicability for TS LCO 3.7.7 (i.e., during Modes 1, 2, and 3, and Mode 4 when the steam generators are relied upon for heat removal), provided the requirements of TS LCO 3.7.6 are met. These proposed changes will eliminate intrusion of CW into the AFW System and CST and allow removal of the aforementioned temporary modification. The proposed changes to TS SR 3.7.7.2 will continue to require verification every 31 days that the normally open IP3 CW Header Supply Isolation valves are open and will also require that a closed backflow preventer isolation valve on the IP3 City Water Supply Header is verified every 31 days to be capable of being opened. In addition, this request proposes changes to TS 3.7.6, "Condensate Storage Tank (CST)," Required Action A.1 to require the closed backflow preventer isolation valve on the IP3 CW Header Supply to be re-opened immediately in the event the CST is declared inoperable.

Entergy has reviewed the proposed amendment in accordance with 10 CFR 50.92 and concludes it does not involve a significant hazards consideration. Due to the ongoing chemistry water concern of CW intrusion into the Auxiliary Feedwater System and CST, it is respectfully requested that this application to amend the Technical Specifications be expeditiously processed.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the New York State Department of Health and Emergency Management Agencies.

The Enclosure to this letter provides a detailed description and evaluation of the proposed changes to TS SR 3.7.7.2 and TS 3.7.6 Required Action A.1. Attachment 1 to the Enclosure contains a markup of the current TS pages. Attachment 2 to the Enclosure contains the retyped TS pages. Attachment 3 to the Enclosure contains a markup of the current TS Bases pages, for information only. Attachment 4 to the Enclosure contains the Risk Assessment for Proposed Changes to the TS in support of this application.

New regulatory commitments made in this letter are included as Attachment 5 to the Enclosure. If you have any questions on this transmittal, please contact Ms. Mahvash Mirzai at 914-254-7714.

Entergy requests review and approval of this proposed license amendment by February 28, 2020.

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

Executed on November 21, 2019.

Sincerely,

Ron Gaston
Director, Nuclear Licensing

RWG/mm/aye

Enclosure: Description and Evaluation of Proposed Changes - Indian Point Nuclear Generating Unit 3

Attachments to Enclosure:

1. Markup of Technical Specifications (TS) Pages - Indian Point Nuclear Generating Unit 3
2. Clean Technical Specifications (TS) Pages - Indian Point Nuclear Generating Unit 3
3. Markup of Technical Specifications (TS) Bases Pages - Indian Point Nuclear Generating Unit 3
4. Risk Assessment for Proposed Changes to IP3 Technical Specifications (TS)
5. List of Regulatory Commitments for Proposed Changes to Indian Point Nuclear Generating Unit 3 Technical Specifications (TS)

cc: Regional Administrator, NRC Region I
NRC Senior Resident Inspector– Indian Point Nuclear Generating Units 2 and 3
Senior Project Manager, NRC/NRR/DORL
President and CEO, NYSERDA
New York State Public Service Commission
NYS Department of Health - Radiation Control Program
NYS Emergency Management Agency

ENCLOSURE

NL-19-093

Description and Evaluation of Proposed Changes

Indian Point Nuclear Generating Unit 3
NRC Docket No. 50-286
Renewed Facility Operating License DPR-64

(12 Pages)

1. SUMMARY DESCRIPTION

In Reference 1, as supplemented by Reference 2, Entergy Nuclear Operations, Inc. (Entergy) requested changes to the Indian Point Nuclear Generating Unit 3 (IP3) Technical Specification (TS) 3.7.7, "City Water," Surveillance Requirement (SR) 3.7.7.2. The change proposed for TS SR 3.7.7.2 included position verification of two additional valves resulting from a modification that added a backflow preventer and inlet and outlet backflow preventer isolation valves, to the CW header supply line to the Auxiliary Feedwater (AFW) Pumps. The proposed change was subsequently approved in Reference 3 under Amendment 218.

There are three valves subject to TS SR 3.7.7.2. These valves include CT-49 (i.e., the Unit 3 CW Supply Header Isolation Valve), CT-1300 (i.e., the CW Inlet to CT-1301 Backflow Preventer Isolation) and CT-1302 (i.e., the CW Outlet to CT-1301 Backflow Preventer Isolation). Under the current requirements of TS 3.7.7, all three valves are maintained open when in the Modes of Applicability for LCO 3.7.7 (i.e., during Modes 1, 2, and 3, and Mode 4 when the Steam Generators (SGs) are relied upon for heat removal), and are required to be verified open once every 31 days in accordance with the TS SR 3.7.7.2 requirements.

CW is the backup to the Condensate Storage Tank (CST) as a water supply for the AFW System. The CST, which is the preferred source of water for the SGs, is capable of holding up to 600,000 gallons and is sized to meet the normal operating and maintenance needs of the Main Steam System. TS LCO 3.7.6, "Condensate Storage Tank (CST)" requires that a minimum water level is maintained in the CST that is sufficient to remove residual heat for 24 hours at hot shutdown conditions following a trip from full power. The CST, although designed to withstand the effects of a design basis earthquake, is not designed to withstand the effects of a tornado-generated missile. However, the AFW System is provided sufficient redundancy of water supplies such that an alternate source of water from the City Water Tank (CWT) is available in the event the CST is damaged by a tornado-generated missile. Only when the CST supply is exhausted or not available will CW be used to supply the AFW System.

When the CST supply is exhausted, CW is used to supply the AFW System for decay heat removal and plant cooldown. CW, although aligned to the IP3 site, is normally isolated from the AFW pump suctions. The CW System includes the site CW header consisting of the 1.5 million gallon CWT and the connection to the offsite water supply. Reference to the CW system as an alternate supply to the AFW System is found in Chapter 10 of the IP3 Updated FSAR (Reference 4).

TS LCO 3.7.6 requires that the CST volume is $\geq$ 360,000 gallons. The LCO is applicable during Modes 1, 2, and 3, and Mode 4 when the SGs are relied upon for heat removal. The OPERABILITY of the CST is determined by maintaining the tank volume at or above the minimum required volume.

TS LCO 3.7.7 requires that the CWT volume is $\geq$ 360,000 gallons (i.e., based on CW header pressure) and that the manual isolation valves in the flow path between the CWT and the AFW pumps suction are open. The LCO is applicable during Modes 1, 2, and 3, and Mode 4 when the SGs are relied upon for heat removal. OPERABILITY of the CW System is determined by maintaining the tank volume at or above the minimum required volume and periodic verification that the CW Header Supply Isolation Valves are open.

The CW system would be placed in service only if the CST were unavailable, since the CST is the preferred source of water for the SGs. CW is placed in service by opening the individual AFW pump suction remote operated valves from the control room (i.e., CT-PCV-1187, CT-PCV-1188, and CT-PCV-1189). These valves currently represent the only boundary between CW and the AFW pump suction. CW intrusion into the AFW System and the CST has been identified due to the boundary valve for 33 AFW pump (i.e., CT-PCV-1189) leaking by, thereby creating water chemistry concerns for the AFW System and the CST, and ultimately, the SGs. Valve repair is not feasible at this time due to long lead times in procuring safety-related parts, in addition to the timeframes required to affect repairs. As an interim measure, a temporary modification has been installed to allow continuous flushing of the 33 AFW pump suction piping as a means of reducing the adverse water chemistry impact resulting from the valve leak-by.

This evaluation supports a request to amend IP3 TS SR 3.7.7.2 to allow for one of the backflow preventer isolation valves on the IP3 CW Header Supply (i.e., either CT-1300 or CT-1302) to be maintained closed when in the Modes of Applicability for TS LCO 3.7.7 (i.e., during Modes 1, 2, and 3, and Mode 4 when the SGs are relied upon for heat removal), provided the requirements of TS Limiting Condition for Operation (LCO) 3.7.6 are met. The proposed changes to TS SR 3.7.7.2 will continue to require verification every 31 days that the normally open IP3 CW Header Supply Isolation valves are open and will also require that the closed backflow preventer isolation valve on the IP3 CW Header Supply is verified every 31 days to be capable of being opened.

In addition, this request proposes changes to TS 3.7.6, Required Action A.1 to require the closed backflow preventer isolation valve on the IP3 CW Header Supply to be re-opened immediately in the event the CST is declared inoperable. By allowing one of the backflow preventer isolation valves on the IP3 CW Header Supply to be closed during Modes of Applicability for TS LCO 3.7.7, the CW intrusion into the AFW System and CST will be substantially reduced, if not altogether eliminated. The proposed changes to TS SR 3.7.7.2 and TS 3.7.6, Required Action A.1 will also allow the temporary modification to be removed.

2. DETAILED DESCRIPTION AND BASIS FOR THE CHANGES

The proposed changes to TS SR 3.7.7.2 would allow one of the backflow preventer isolation valves on the IP3 CW Header Supply (i.e., either CT-1300 or CT-1302) to be maintained closed when in the Mode of Applicability for TS LCO 3.7.7 . The proposed changes to TS SR 3.7.7.2 will continue to require verification every 31 days that the normally open IP3 CW Header Supply Isolation valves are open. These changes will also require verification every 31 days that a closed backflow preventer isolation valve on the IP3 CW Header Supply is capable of being opened. In addition, the proposed changes to TS 3.7.6, Required Action A.1 require the closed backflow preventer isolation valve on the IP3 CW Header Supply to be re-opened immediately in the event the CST is declared inoperable.

The current TS SR 3.7.7.2 specifies the following:

Surveillance		Frequency
3.7.7.2	Verify the Unit 3 City Water Header Supply Isolation Valves are open.	31 days

The proposed changes to TS SR 3.7.7.2 are as follows:

Surveillance		Frequency
3.7.7.2	----------NOTE---------- One backflow preventer isolation valve on the Unit 3 City Water Header Supply may be maintained closed, provided the requirements of LCO 3.7.6 are met. ---------- For Unit 3 City Water Header Supply Isolation Valves maintained open, verify valves are open. <u>AND</u> For one backflow preventer isolation valve on the Unit 3 City Water Header Supply maintained closed, verify capability of valve to be opened.	 31 days 31 days

The current TS 3.7.6 Required Action A.1 specifies the following under Condition A for an inoperable CST:

Required Actions		Completion Time
A.1	Verify by administrative means OPERABILITY of City Water.	Immediately <u>AND</u> Once per 12 hours thereafter

The proposed changes to TS 3.7.6 Required Action A.1 are as follows:

Required Actions		Completion Time
	----------Note---------- OPERABILITY of City Water with CST inoperable requires Unit 3 City Water Header Supply Isolation Valves to be open. ----------	
A.1.1	Open closed Unit 3 City Water Header Supply Isolation Valve if previously closed per Note modifying SR 3.7.7.2. <u>AND</u>	Immediately
A.1.2	Verify by administrative means OPERABILITY of City Water.	Immediately <u>AND</u> Once per 12 hours thereafter

Attachment 1 to this Enclosure contains a markup of the current TS pages. Attachment 2 to this Enclosure contains the clean retyped TS pages proposed to modify TS SR 3.7.7.2 and TS 3.7.6 Required Action A.1 as detailed above. In addition, Attachment 3 to this Enclosure contains a markup of the proposed changes to the affected TS Bases pages. Attachment 3 is provided for information only.

Current TS SR 3.7.7.2 verifies that the valves that isolate Unit 3 from the site CW supply and the CWT are open, with a required frequency of 31 days. The isolation valves subject to SR 3.7.7.2 include: CT-49 (i.e., the Unit 3 CW Supply Header Isolation Valve) located in the Unit 1 Utility Tunnel, and CT-1300 (i.e., the CW Inlet to CT-1301 Backflow Preventer Isolation) and CT-1302 (i.e., CW Outlet to CT-1301 Backflow Preventer Isolation). Both CT-1302 and CT-1301 are located in the AFW pump room. Entergy proposes to modify existing IP3 TS SR 3.7.7.2 to allow one of the two Unit 3 backflow preventer isolation valves on the Unit 3 City Water Header Supply (i.e., either CT-1300 or CT-1302) to be maintained closed when in the Modes of Applicability for TS LCO 3.7.7. The proposed changes would continue to require the valves that are maintained open to be verified that they are open every 31 days and would also require that if a backflow preventer isolation valve is maintained closed that it is verified to be capable of being opened under the same 31 day frequency. In addition, the proposed changes to TS 3.7.6, Required Action A.1 would require the closed backflow preventer isolation valve on the Unit 3 CW Header Supply to be re-opened immediately in the event the CST is declared inoperable.

The CW system would be placed in service only if the CST were unavailable since the CST is the preferred source of water for the SGs. CW is placed in service by opening the individual AFW pump suction valves from the control room (i.e., CT-PCV-1187, CT-PCV-1188 and CT-PCV-1189), which is a manual action governed by existing procedures to align CW to the suction of the AFW pumps. These valves currently represent the only boundary between CW and the AFW pump

suction. CW intrusion into the AFW System and CST has been identified due to leak-by of the 33 AFW Pump CW makeup valve (i.e., CT-PCV-1189), thereby creating a water chemistry concern for the AFW System and the CST, and ultimately, the SGs. Valve repair is not feasible at this time due to long lead times in procuring safety-related parts in addition to the timeframe required to affect repairs. As an interim measure, a temporary modification has been installed to allow continuous flushing of the 33 AFW pump suction piping as a means of reducing the adverse water chemistry impact resulting from the valve leak-by.

As indicated above, the proposed changes to TS SR 3.7.7.2 would allow operation with one of the backflow preventer isolation valves on the IP3 CW Header Supply to be closed when in the Modes of Applicability for TS LCO 3.7.7, provided the requirements of TS LCO 3.7.6 are met. The proposed changes to TS 3.7.6, Required Action A.1 would require the closed backflow preventer isolation valve to be re-opened immediately in the event the CST is declared inoperable. CW intrusion into the AFW System and CST will be substantially reduced, if not altogether eliminated by allowing one of the backflow preventer isolation valves on the IP3 CW header supply to be maintained closed, provided the requirements of LCO 3.7.6 are met. The proposed changes to TS 3.7.7.2 and TS 3.7.6, Required Action A.1 will also allow the removal of a temporary modification. The change involved to align CW to the suction of the AFW pumps requires re-opening the closed backflow preventer isolation valve by a nuclear plant operator, in addition to the already required manual action of opening the individual AFW pump suction remote air-operated valves (AOVs) from the control room. This request does not replace an automatic action with a manual action, isolate a safety related source of water that was previously unisolated, or close a valve that was previously required to be locked open. The requested change adds an additional manual action to align the backup non-safety related CW supply for the AFW pumps when the normal source of CST water is unavailable or depleted.

The AFW pump room and the equipment located in this room are protected from the effects of tornadoes and tornado-generated missiles. In addition, the backflow preventer valves located in the AFW pump room are protected from the effects of an AFW steam-driven pump turbine missile and can be easily accessed by a nuclear plant operator. The CST itself (i.e., the preferred source of water for the AFW pumps), is designed to withstand the effects of a design basis seismic event and can withstand the effects of direct impact of a design basis tornado. However, the CST is not protected from the effects of tornado-generated missiles. The CW system would only be aligned to the suction of the AFW pumps in the event the CST were unavailable or depleted.

The backflow preventer isolation valves on the IP3 CW Header Supply are 6-inch manually operated gate valves and are not in a harsh or corrosive environment that would degrade or affect their condition. Operator access to CT-1300 and CT-1302 is not expected to be impeded when needed, since an acceptable ambient environment is normally present in the AFW pump room. The occurrence of a High Energy Line Break (HELB) or fire in the AFW pump room, concurrent with a CST malfunction (i.e., resulting in CST inventory depletion) or a tornado-generated missile (i.e., detrimentally affecting the CST) is not in the current licensing basis for IP3. If the CST is inoperable for any reason, TS 3.7.6 limits this timeframe to 7 days prior to the need to initiate a plant shutdown. A HELB or fire occurring in the AFW Pump Room during this limited timeframe is highly unlikely. It is also noted that although immediate accessibility to the AFW Pump Room may be adversely impacted following such events, accessibility to the room would quickly be restored. To address any accessibility issues resulting from a HELB or Fire in the AFW pump room with an inoperable CST for unrelated reasons, the proposed changes to TS 3.7.7.2 will only allow one of the backflow preventer isolation valves to be maintained closed if the CST is operable in accordance with the requirements of TS LCO 3.7.6. The proposed changes to TS 3.7.6, Required

Action A.1 would require the closed backflow preventer isolation valve on the IP3 CW Header Supply to be re-opened immediately in the event the CST is declared inoperable.

The design of the CST provides for several level alarms in the control room. One alarm (i.e., the CST Trouble Alarm) is essentially a TS monitoring alarm that alerts the operators of depletion in normal CST inventory. This common alarm on Control Room Panel, "SCF-Condensate and Feedwater," is fed from redundant level controllers that are set at 20.66 feet; This setpoint is above the minimum TS volume of water (i.e., 360,000 gallons) required by TS SR 3.7.6.1. In addition, the CST also has two redundant low-low level alarms that are set at 2.75 feet. These alarms on Control Room Panel "SKF-Bearing Monitor" are intended to alert the operators in the control room that the preferred source of water for the suction of the AFW pumps has been depleted and requires actions to place the CW system in service. As previously indicated, aligning the CW system to the AFW pump suction currently requires manual actions to be taken by the control room operators to open the individual AFW pump suction valves. The proposed changes to TS SR 3.7.7.2 and TS 3.7.6, Required Action A.1 will now also require the closed backflow preventer isolation valve on the IP3 CW Header Supply (i.e., either CT-1300 or CT-1302) to be manually opened in the AFW pump room by a nuclear plant operator as part of the response to these alarms. In addition to these alarms, the CST design also provides for automatic isolation of the Condensate System makeup supply by closing valves CT-LCV-1158-1 and CT-LCV-1158-2 if the CST level decreases below 19.66 feet. This automatic action ensures that 360,000 gallons of water in the CST is reserved for AFW System use in the event of decreasing CST level.

In addition to the evaluation performed to establish the acceptability of the proposed changes to SR 3.7.7.2 and TS 3.7.6, Required Action A.1, Entergy performed a detailed risk assessment in support of the proposed changes. The risk assessment is included as Attachment 4 to this Enclosure. This risk assessment includes information confirming that the technical adequacy of the baseline PRA model, as well as the cause/effect relation supporting the amendment request, meets the published standards in Regulatory Guide (RG) 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities."

Both the evaluation and risk assessment identified the need to revise plant procedures that would assure that sufficient time was available to align the CW system as a backup suction source of water for the AFW pumps in the event the CST was unavailable or depleted. Specifically, the evaluation and risk assessment identified the need to revise Alarm Response Procedure 3-ARP-006, "Panel SCF–Condensate and Feedwater," associated with the CST Trouble Alarm, and 3-ARP-013, "Panel SKF-Bearing Monitor," associated with the CST Lo-Lo Level Alarms. The procedures will be revised as part of the proposed changes to TS SR 3.7.7.2 and TS 3.6.7, Required Action A.1.

Entergy will revise 3-ARP-006 to require that the backflow preventer isolation valve on the IP3 CW Header Supply (i.e., either CT-1300 or CT-1302) be re-opened when this alarm is actuated in the control room. There are approximately seven hours available to re-open the valve once the CST Trouble alarm is received, prior to reaching the CST Lo-Lo Level alarm, which as, indicated above, actuates when the CST reaches 2.75 feet. This provides sufficient time for a nuclear plant operator to open the valve.

Entergy will revise 3-ARP-013 to verify the closed backflow preventer isolation valve (i.e., either CT-1300 or CT-1302) has been opened as part of the actions to place the CW System in service. In the unlikely event the valve is found closed in response to the CST Lo-Lo Level alarm, sufficient time has been confirmed to be available to re-open the valve and place the CW System in service, prior to reaching CST levels where air ingestion into the AFW pump suction would be of concern.

In addition, Entergy will revise Standard Operating Procedure 0-SOP-WEATHER-002, "Severe Weather Preparations" to require a nuclear plant operator to re-open the backflow preventer isolation valve on the IP3 CW Header Supply in the event a tornado warning is issued by the National Weather Service as a result of severe weather conditions. As previously indicated, the AFW pump room is designed to withstand the effects of a tornado or a tornado generated missile. This action provides adequate time to align CW to the AFW pump suction in the event the CST is damaged by a tornado-generated missile causing level to drop below the minimum required volume of 360,000 gallons. This change provides for the pre-emptive action of re-opening the backflow preventer isolation valve on the IP3 CW Header Supply in the event a tornado warning is declared.

Finally, Entergy will revise 3-SOP-ESP-01, "Local Equipment Operation and Contingency Actions" and Emergency Operating Procedure (EOP) 3-FR-H.1, "Response to Loss of Secondary Heat Sink" to require the closed backflow preventer isolation valves to be opened in addition to the individual AFW pump suction valves as part of the actions needed to place the CW System in service as the suction water supply to the AFW pumps for conditions in which the control room is unavailable, or in response to a loss of secondary heat sink under the Function Restoration Procedures for the Emergency Operating Procedures.

The risk assessment concluded that the proposed changes to TS SR 3.7.7.2 and TS 3.7.6, Required Action A.1 are considered non-risk significant. The risk evaluation includes the impact on internal events as well as the risk due to tornadoes, high winds, seismic events, and fires, including the potential frequency for the concurrent loss of the CWT and CST due to tornadoes. The risk assessment estimated that the total increase in core damage frequency (CDF) due to the proposed changes, including both internal and external events, was 1.2 E-8/year, and that the worst-case total increase in large early release frequency (LERF), from both internal and external events, was 6.7E-9/year. The above estimated increase in CDF (1.2 E-8/year) is well below the CDF screening criteria of 1E-6/year for permanent TS changes in accordance with RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications." Furthermore, the estimated increase in CDF is also less than the LERF screening criterion of 1E-7/year. Therefore, the risk assessment concluded that the proposed changes to TS SR 3.7.7.2 and TS 3.7.6, Required Action A.1 are considered non-risk significant.

The evaluations performed in support of the proposed changes to TS SR 3.7.7.2 and TS 3.7.6, Required Action A.1 concluded that the proposed changes were acceptable provided that the procedure revisions described above are implemented, pending approval of the proposed TS changes. As indicated above, these procedure revisions include requiring the closed backflow preventer isolation valve (i.e., CT-1300 or CT-1302) to be re-opened if a CST Trouble alarm were received in the control room or in the event of a tornado warning, and that the closed backflow preventer isolation valve be verified to have been reopened if a CST Lo-Lo Level alarm were received in the control room as part of the actions to place the CW System in service. In addition, procedure revisions to re-open the closed backflow preventer isolation valve as part of the actions needed to place the CW System in service as the suction water supply to the AFW pumps for conditions in which the control room is unavailable or in response to a loss of secondary heat sink,

are also required. Affected sections of the Updated FSAR will also be revised as necessary as part of the implementation of the proposed changes to TS SR 3.7.7.2 and TS 3.7.6 Required Action A.1.

3. REGULATORY EVALUATION

3.1 APPLICABLE REGULATORY REQUIREMENT/CRITERIA

10 CFR 50.36 establishes the requirements for Technical Specifications (TS). 10 CFR 50.36(c)(2), "Limiting conditions for operation," identifies that Limiting Conditions for Operation (LCOs) shall be included in the TS and shall include requirements relating to when a limiting condition for operation of a nuclear reactor is not met, including requirements to shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met. In addition,10 CFR 50.36(c)(3), "Surveillance Requirements," identifies that Surveillance Requirements (SRs) shall be included in the TS and shall include requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met. This license amendment request is proposing changes to Indian Point Nuclear Generating Unit 3 (IP3) TS 3.7.6 Required Action A.1 related to additional actions required if the CST is inoperable and IP3 TS SR 3.7.7.2 related to the City Water Header Supply Isolation Valve lineup.

3.2 NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

Pursuant to 10 CFR 50.92, Entergy Nuclear Operations, Inc. (Entergy) has reviewed the proposed changes and concludes that the changes do not involve a significant hazards consideration since the proposed changes satisfy the criteria in 10 CFR 50.92(c). These criteria require that operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

The proposed amendment revises Indian Point Nuclear Generating Unit 3 (IP3) Technical Specification (TS) 3.7.7, "City Water," (CW) Surveillance Requirement (SR) 3.7.7.2 to allow one of the backflow preventer isolation valves on the IP3 CW Header Supply to be maintained closed when in the Modes of Applicability for TS LCO 3.7.7, provided the requirements of TS LCO 3.7.6, "Condensate Storage Tank (CST)," are met. These proposed changes will eliminate intrusion of CW into the Auxiliary Feedwater (AFW) System and CST and allow removal of a temporary modification. In addition, this request proposes changes to TS 3.7.6, Required Action A.1 to require the closed backflow preventer isolation valve on the IP3 CW Header Supply to be re-opened immediately in the event the CST is declared inoperable.

The discussion below addresses each of the 10 CFR 50.92(c) criteria and demonstrates that the proposed amendment does not constitute a significant hazard consideration.

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   The proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed amendment would modify IP3 TS SR 3.7.7.2 to allow one of the backflow preventer isolation valves on the IP3 CW Header Supply to be maintained closed, provided the requirements of TS LCO 3.7.6 are met. In addition, the proposed change to TS 3.7.6 Required Action A.1 would require the closed backflow preventer isolation valve to be re-opened immediately in the event the CST is declared inoperable. The proposed changes to SR 3.7.7.2 and TS 3.7.6, Required Action 1 do not affect any initiator or precursor of any accident previously evaluated. Therefore, the proposed change does not involve a significant increase in the probability of an accident previously evaluated.

   The CST is the preferred source of water for the AFW System, and this remains unchanged. The consequences of accidents or events in which the AFW is credited or required are normally mitigated by operation of the AFW System. The CW system can be used as a backup to the CST in the event the CST is unavailable for any reason, including due to CST damage from a tornado-generated missile.

   In order to place the CW System in service, the proposed changes will add a field action by a nuclear plant operator to open one of the backflow preventer isolation valves on the IP3 CW Header Supply, in addition to the already required manual action to open the individual AFW pump suction valves from the control room. The proposed changes will also require the closed backflow preventer isolation valve on the IP3 CW Header Supply to be re-opened immediately in the event the CST is declared inoperable. As a result, the CW system will continue to provide a reliable means of backup cooling to the AFW pumps. Therefore, the proposed amendment does not involve a significant increase in the consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No.

   The proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

   The proposed amendment would modify IP3 TS SR 3.7.7.2 to allow one of the backflow preventer isolation valves on the IP3 CW Header Supply to be

maintained closed, provided the requirements of TS LCO 3.7.6 are met. In addition, the proposed changes to TS 3.7.6, Required Action A.1 would require the closed backflow preventer isolation valve to be re-opened immediately in the event the CST is declared inoperable.

The proposed amendment will not involve any physical changes to the existing plant, so no new malfunctions could create the possibility of a new or different kind of accident. The proposed amendment makes no changes to conditions external to the plant that could create the possibility of a new or different kind of. accident. The proposed change will not create the possibility of a new or different kind of accident as no new accident initiators, precursors, failure mechanisms, or malfunctions are being introduced by the proposed changes.

The AFW System, the CST, and the CW System will continue to perform their design basis cooling functions for previously evaluated accidents or events for which the AFW System is credited or required. The normal source of CST cooling water for the AFW pumps is unaffected by the proposed changes. The AFW System is provided sufficient redundancy of water supplies such that the alternate source of water from the CW System is available in the event the CST is unavailable.

Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any previously evaluated.

3. <u>Does the proposed amendment involve a significant reduction in the margin of safety?</u>

Response: No.

The proposed amendment does not involve a significant reduction in the margin of safety.

The proposed amendment would modify IP3 TS SR 3.7.7.2 to allow one of the backflow preventer isolation valves on the IP3 CW Header Supply to be maintained closed, provided the requirements of TS LCO 3.7.6 are met. In addition, the proposed changes to TS 3.7.6, Required Action A.1 would require the closed backflow preventer isolation valve to be re-opened immediately in the event the CST is declared inoperable.

The change does not exceed or alter any controlling numerical value for a parameter established in the FSAR or elsewhere in the IP3 licensing basis related to design basis or safety limits. Entergy has performed a risk assessment in support of the proposed amendment and concluded that this change is not risk significant.

The proposed changes only affect the manual actions required to place the CW system in service. No automatic actions are affected by the proposed changes. This request does not replace an automatic action with a manual action, isolate a safety related source of water that was previously unisolated, or close a valve that was previously required to be locked open. The CW

system will continue to provide a reliable means of backup cooling to the AFW pumps.

Therefore, the proposed amendment does not involve a significant reduction in the margin of safety.

Based on the above, Entergy concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

3.3 CONCLUSION

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

4. ENVIRONMENTAL CONSIDERATIONS

This amendment request meets the eligibility criteria for categorical exclusion from environmental review set forth in 10 CFR 51.22(c)(9) as follows:

(i) The amendment involves no significant hazards consideration.

As described in Section 3.2 of this evaluation, the proposed changes involve no significant hazards consideration.

(ii) There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite.

The proposed amendment does not involve any physical alterations to the facility configuration that could lead to a change in the type or amount of effluent release offsite.

(iii) There is no significant increase in individual or cumulative occupational radiation exposure.

The proposed amendment does not involve a significant increase in individual or cumulative occupational radiation exposure.

Based on the above, Entergy concludes that the proposed changes meet the eligibility criteria for categorical exclusion as set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

5. REFERENCES

1) Entergy Nuclear Operations, Inc. (Entergy) letter to U.S. Nuclear Regulatory Commission (NRC), "Proposed Change to Technical Specifications Regarding City Water Tank Surveillance Requirements," dated June 24, 2002 (Letter IPN-02-050) (ADAMS Accession No. ML021860222)

2) Entergy letter to U.S. Nuclear Regulatory Commission (NRC), "City Water Surveillance Requirement," dated June 23, 2003 (Letter NL-03-104) (ADAMS Accession No. ML031780019)

3) NRC Letter to Entergy, "Indian Point Nuclear Generating Unit No. 3 - Issuance of Amendment Re: City Water Tank (TAC NO. ME35506)," dated August 4, 2003 (ADAMS Accession No. ML032160069)

4) Indian Point Nuclear Generating Unit 3 Updated FSAR, Chapter 10

ATTACHMENT 1 to ENCLOSURE

NL-19-093

Markup of Technical Specifications (TS) Pages

Indian Point Nuclear Generating Unit 3
NRC Docket No. 50-286
Renewed Facility Operating License DPR-64

Unit 3 TS Pages

3.7.6-1
3.7.6-2
3.7.7-2

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Added text is shown in *italics*

3.7 PLANT SYSTEMS

3.7.6 Condensate Storage Tank (CST)

LCO 3.7.6 The CST shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CST inoperable.	----------*NOTE*---------- *OPERABILITY of City Water with CST inoperable requires Unit 3 City Water Header Supply Valves to be open.* ----------	
	A.1.1 *Open closed Unit 3 City Water Header Supply Isolation Valve if previously closed per Note modifying SR 3.7.7.2.*	*Immediately*
	AND	
	A.1.2 Verify by administrative means OPERABILITY of City Water.	Immediately AND Once per 12 hours thereafter
	AND	
	A.2 Restore CST to OPERABLE.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 4, without reliance on steam generator for heat removal	18 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the CST level is ≥ 360,000 gal.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	Verify the CW header pressure is ≥ 30 psig.	12 hours
SR 3.7.7.2	----------*NOTE*---------- *One backflow preventer isolation valve on the Unit 3 City Water Header Supply may be maintained closed, provided the requirements of LCO 3.7.6 are met.* ----------	
	For Unit 3 City Water Header Supply Isolation valves maintained open, verify valves are open.	*31 days*
	AND	
	For one backflow preventer isolation valve on the Unit 3 City Water Header Supply maintained closed, verify capability of valve to be opened.	*31 days*
	~~Verify the Unit 3 City Water Header Supply Isolation Valves are open.~~	~~31 days~~
SR 3.7.7.3	Perform testing required by Inservice Testing Program for each valve needed to align CW to each AFW pump suction.	In accordance with the Inservice Testing Program

ATTACHMENT 2 to ENCLOSURE

NL-19-093

Clean Technical Specifications (TS) Pages

Indian Point Nuclear Generating Unit 3
NRC Docket No. 50-286
Renewed Facility Operating License DPR-64

Unit 3 TS Pages

3.7.6-1
3.7.6-2
3.7.7-2

3.7 PLANT SYSTEMS

3.7.6 Condensate Storage Tank (CST)

LCO 3.7.6 The CST shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CST inoperable.	----------NOTE---------- OPERABILITY of City Water with CST inoperable requires Unit 3 City Water Header Supply Valves to be open. ----------	
	A.1.1 Open closed Unit 3 City Water Header Supply Isolation Valve if previously closed per Note modifying SR 3.7.7.2.	Immediately
	AND	
	A.1.2 Verify by administrative means OPERABILITY of City Water.	Immediately AND Once per 12 hours thereafter
	AND	
	A.2 Restore CST to OPERABLE.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	AND	
	B.2 Be in MODE 4, without reliance on steam generator for heat removal	18 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the CST level is ≥ 360,000 gal.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	Verify the CW header pressure is ≥ 30 psig.	12 hours
SR 3.7.7.2	----------NOTE---------- One backflow preventer isolation valve on the Unit 3 City Water Header Supply may be maintained closed, provided the requirements of LCO 3.7.6 are met. ---------- For Unit 3 City Water Header Supply Isolation valves maintained open, verify valves are open. AND For one backflow preventer isolation valve on the Unit 3 City Water Header Supply maintained closed, verify capability of valve to be opened.	 31 days 31 days
SR 3.7.7.3	Perform testing required by Inservice Testing Program for each valve needed to align CW to each AFW pump suction.	In accordance with the Inservice Testing Program

ATTACHMENT 3 to ENCLOSURE

NL-19-093

Markup of Technical Specifications (TS) Bases Pages

Indian Point Nuclear Generating Unit 3
NRC Docket No. 50-286
Renewed Facility Operating License DPR-64

Unit 3 TS Bases Pages

(For Information Only)

B 3.7.6-3
B 3.7.7-1
B 3.7.7-2
B 3.7.7-4

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Added text is shown in *italics*

BASES

LCO (Continued)

The OPERABILITY of the CST is determined by maintaining the tank level at or above the minimum required level. CST venting and pressure relief capability are required for the CST to perform both its normal and emergency function. The venting and pressure relief functions are satisfied by either of the CST breather valves or equivalent venting capacity.

APPLICABILITY

In MODES 1, 2, and 3, and in MODE 4, when steam generator is being relied upon for heat removal, the CST is required to be OPERABLE.

In MODE 5 or 6, the CST is not required because the AFW System is not required.

ACTIONS

A.1 and A.2

If the CST is not OPERABLE, the *Unit 3 City Water Header Supply Isolation Valve, if previously closed as permitted by the Note modifying SR 3.7.7.2, must be immediately opened as specified by Required Action A.1.1. In addition, the* OPERABILITY of the backup supply (city water) should be verified by administrative means immediately and once every 12 hours thereafter *as specified by Required Action A.1.2.* OPERABILITY of the backup auxiliary feedwater supply means that LCO 3.7.7, City Water, is met and includes verification that the flow paths from city water to the AFW pumps are OPERABLE. The CST must be restored to OPERABLE status within 7 days. The immediate Completion Times for *opening the Unit 3 City Water Header Supply Isolation Valve, if closed, and* verification of the OPERABILITY of the backup water supply ensures that Condition B is entered immediately if both the CST and City Water are inoperable. The 7 day Completion Time for restoration of the CST is reasonable, based on an OPERABLE backup water supply being available, and the low probability of an event occurring during this time period requiring the CST.

Required Action A.1.1 is modified by a Note specifying that OPERABILITY of City Water with the CST inoperable requires the Unit 3 City Water Header Supply Valves to be open. With the CST operable, one of the backflow preventer isolation valves associated with the Unit 3 City Water Header Supply is permitted to be maintained closed. However, if the CST is inoperable, then all the Unit 3 City Water Header Supply Valves must be maintained open.

B.1 and B.2

If the CST cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply.

(continued)

B 3.7 PLANT SYSTEMS

B 3.7.7 City Water (CW)

BASES

BACKGROUND

City Water is the backup to the Condensate Storage Tank (CST) as a water supply for the Auxiliary Feedwater System. The CST, the preferred source of water for the Steam Generators (SGs), is capable of holding up to 600,000 gallons and is sized to meet the normal operating and maintenance needs of the main steam system. LCO 3.7.6, Condensate Storage Tank, requires that a minimum water level is maintained in the CST that is sufficient to remove residual heat for 24 hours at hot shutdown conditions following a trip from full power. The CST is not designed to withstand the effects of a tornado-generated missile. However, the Auxiliary Feedwater System is provided sufficient redundancy of water supplies such that an alternate source of water from the City Water Tank (CWT) is available in the event the CST is damaged by a tornado-generated missile. Only when the CST supply is exhausted or not available will city water be used to supply the Auxiliary Feedwater System.

When the main steam isolation valves are open, the preferred means of heat removal from the RCS is to discharge steam to the condenser via the non-safety grade turbine steam bypass valves (High Pressure Steam Dump) with water supplied from the CST to the SGs using the AFW System. The condensed steam is returned to the CST by the condensate pump. This configuration conserves condensate and minimizes releases to the environment. The CST is the preferred source of water for the SGs.

When the CST supply is exhausted, city water is used to supply the Auxiliary Feedwater System for decay heat removal and plant cooldown. CW~~, although aligned to the IP3 site,~~ is normally isolated from the AFW pump suctions.

The City Water System includes the site city water header consisting of the 1.5 million gallon city water storage tank and the connection to the offsite water supply. Reference to the CW system as an alternate supply to the Auxiliary Feedwater is found in FSAR, Section 10 (Ref. 1).

(continued)

BASES

APPLICABLE SAFETY ANALYSES

CW can be used to provide cooling water to remove decay heat and to cool down the unit following all events in the accident analysis as discussed in the FSAR; however, it has been established by engineering calculations that 360,000 gallons of water in the CWT is adequate to cooldown the plant from 102% rated thermal power to RHR entry conditions in 10 hours if the CST is not available or depleted. The CST is not designed to withstand the effects of a tornado generated missile and CW is used only when the CST is not available or depleted.

CW satisfies Criterion 3 of 10 CFR 50.36.

LCO

This LCO requires that the CW Tank volume is ≥ 360,000 gallons and the isolation valves in the flow path between the CWT and the AFW pumps suction are *either* open *or capable of being opened, provided the requirements of LCO 3.7.6 are met. If the requirements of LCO 3.7.6 are not met, then the isolation valves in the flow path between the CWT and the AFW pumps suction must all be open.* The CWT volume of 360,000 gallons has been determined by calculations to be adequate for a plant cooldown from 102% rated thermal power to RHR entry conditions in 10 hours (Reference 3).

The OPERABILITY of the CW is determined by maintaining the tank volume at or above the minimum required volume and periodic verification that the required lineups can be established.

APPLICABILITY

City Water is required to be OPERABLE in MODES 1, 2, and 3, and in MODE 4, when a steam generator is being relied upon for heat removal. In MODE 5 or 6, CW is not required because the SGs are not normally used to remove decay heat when in these MODES.

ACTIONS

A.1 and A.2

If the CW Tank volume is not within limits or system lineups are not as required, CW cannot be assumed to be available if needed as a backup water source for the CST. With CW not available, OPERABILITY of the CST must be verified by administrative means immediately and once every 12 hours thereafter. Operability of the CST means that LCO 3.7.6, Condensate Storage Tank, is met. The immediate Completion Time for verification of the OPERABILITY of the CST ensures that Condition B is entered immediately if both the CST and

(continued)

SURVEILLLANCE REQUIREMENTS (continued)

SR 3.7.7.2

This SR verifies that the *normally open* valves that isolate Unit 3 from the site city water supply and the city water storage tank are open, *and that the normally closed backflow preventer isolation valve that isolates Unit 3 from the site city water supply and the city water storage tank is capable of being opened.* The Isolation valves are CT-49, in the IP1 Utility Tunnel, (also identified as valve FP-1227), *and backflow preventer valves* CT-1300 and CT-1302. SR for CT-49 may be performed by Unit 2 personnel. *The surveillance is modified by a Note that allows one of the backflow preventer isolation valves to be maintained in the closed position, provided the requirements of LCO 3.7.6 are met. If the requirements of LCO 3.7.6 are not met, then both backflow preventer isolation valves (CT-1300 and CT-1302) must be open, in addition to CT-49.* The 31 day Frequency is acceptable ~~because the valves are sealed open and~~ because periodic verification provided by SR 3.7.7.2 provides a high degree of assurance that the *normally open* valves are positioned properly, *and that the normally closed backflow preventer isolation valve is capable of being positioned open, thus assuring that the required lineups can be established.*

SR 3.7.7.3

This SR verifies the ability to cycle each valve between CW and the AFW pump suction. These are the only valves required to operate to align CW to the AFW pump suction. The testing requirements and Frequency for this SR are in accordance with the Inservice Testing Program.

REFERENCES

1. FSAR, Chapter 10.
2. Design Basis Document IP3-DBD-303, “Auxiliary Feedwater System”.
3. Design Basis Document IP3-DBD-319, “Condensate and Condensate Polishing Systems”.
4. IP3-CALC-MW-03548.

ATTACHMENT 4 to ENCLOSURE

NL-19-093

Risk Assessment for Proposed Changes to
IP3 Technical Specifications (TS)

Indian Point Nuclear Generating Unit 3
NRC Docket No. 50-286
Renewed Facility Operating License DPR-64

(35 pages)

1.0 BACKGROUND

To eliminate the increased salinity issue in the Indian Point Nuclear Generating Unit 3 (IP3) steam generators (SGs), Entergy Nuclear Operations, Inc. (Entergy) is proposing a license amendment for IP3 to revise Technical Specification (TS) 3.7.7, "City Water," Surveillance Requirement (SR) 3.7.7.2, which currently contains the requirement to verify at least once per 31 days that the IP3 CW Header Supply Isolation Valves are open. This TS change would allow the City Water (CW) supply to the Auxiliary Feedwater (AFW) pumps to be isolated via closure of manual valve CT-1300 or CT-1302. However, this change would also require an operator to be dispatched to locally open CT-1300 or CT-1302 (depending on which valve is used for isolation) in the event that CW needs to be aligned to provide alternative suction to the AFW pumps in the event the Condensate Storage Tank (CST) is not available.

Therefore, this Probabilistic Risk Assessment (PRA) evaluation has been performed to assess the impact on IP3 risk associated with maintaining either CT-1300 or CT-1302 in the closed position during normal plant operation. The risk assessment is based on the latest approved IP3 internal events PRA model of record as documented in engineering report PSA-IP3-01 [Ref. 1]. The external events portion of the analysis is based on NUREG/CR-4461 [Ref. 9] for tornado events and the IP3 Individual Plant Examination of External Events (IPEEE), as documented in engineering report IP3-RPT-UNSPEC-02182 [Ref. 2], for all other external events.

Note that the proposed license amendment change also involves revising TS 3.7.6, "Condensate Storage Tank (CST)," to immediately open CT-1300 (or CT-1302) if the CST is unavailable for any reason. Therefore, should an initiating event occur, unavailability of the CST will not require local action to re-open these manual valves following the initiating event since the valves should already be open per TS 3.7.6. As a result, there is no impact on risk associated with the changes to TS 3.7.6. Unavailability of the CST following an initiating event is addressed by this risk assessment.

2.0 ASSUMPTIONS

The following assumptions were used as input into the risk assessment.

1. The PRA evaluation is based on allowing either CT-1300 or CT-1302, but not both, to be closed during plant operation. Maintaining both CT-1300 and CT-1302 closed concurrently is not addressed by this risk assessment. If there is a time when both valves must be closed, the existing TS completion time of seven days should be utilized.
2. Alarm response procedure 3-ARP-006 will be revised to direct an operator to re-open CT-1300 or CT-1302 when CST level decreases to 20.66 feet. This assumption lowers the human error probability (HEP) associated with re-opening the valve by allowing additional time for an operator to perform this local action.

3. System Operating Procedure 0-SOP-WEATHER-002, "Severe Weather Preparations," will be revised to direct an operator to open CT-1300 or CT-1302 following issuance of a tornado warning. Although conservatively not credited due to the unpredictable nature of tornadoes, this change would significantly improve (lower) the associated HEP for re-opening CT-1300 or CT-1302.
4. Applicable IP3 fire procedures will be revised to include the action to re-open CT-1300 or CT-1302 before direction is given to align CW. As fire events are not an important contributor to CST unavailability, this assumption does not impact the results.
5. Valves CT-1300 and CT-1302 will be included as part of a surveillance program which will periodically cycle the valves to ensure that they will be reliably capable of opening if demanded. This change impacts the results by ensuring that the probability of CT-1300 or CT-1302 failing to re-open is consistent with the assumed failure rate.

3.0 RISK EVALUATION

The impact on plant risk was evaluated for internal events, including internal floods and external events (i.e., tornadoes and high winds, seismic events and fires).

3.1 Impact on Internal Events

The risk assessment for changing SR 3.7.7.2 to allow CT-1300 or CT-1302 to remain closed is based on the probability of having the CST unavailable, the primary cause of which is expected to result from tornado events. However, there is also a risk contribution from internal events since CW is credited in the IP3 Probabilistic Risk Assessment (PRA) model for providing backup cooling to the charging pumps and 31 RHR Pump as well as backup suction to the auxiliary feedwater (AFW) pumps. The ability to align CW backup cooling to the charging pumps or 31 RHR Pump is NOT impacted by closure of CT-1300 or CT-1302, which only impacts the ability to align backup suction to the AFW pumps from CW. For internal events, the increase in risk is attributed to two factors: 1) the increased time required to align CW backup to the AFW pumps due to having to locally re-open manual valve CT-1300 or CT-1302, which increases the HEP associated with aligning CW; and 2) the probability that CT-1300 or CT-1302 fails to open when needed. The increase in internal events risk due to these two factors is discussed below.

The current procedural cue for aligning CW is not initiated until CST level decreases to the low-low water level setpoint of 2.75 feet per Alarm Response Procedure 3- ARP-013 [Ref. 3]. Given the limited CST suction available to the AFW pumps once CST level decreases to 2.75 feet, the need for an operator to have to locally open CT-1300 or CT-1302 reduces the available time margin to successfully complete the action and thus increases the HEP. However, a CST trouble alarm is also available in the control room when CST level decreases to the low setpoint of 20.66 feet. Revising Alarm Response Procedure 3-ARP-006 [Ref. 4] to direct an operator to re-open CT-1300 or CT-1302 when CST level decreases to the CST trouble alarm setpoint of 20.66 feet leaves ample time to assure that the CW backup suction to the AFW pumps can be initiated from the

control room by the time CST level drops to the low-low level of 2.75 feet. Hence, the increase in the HEP associated with failing to re-open CT-1300 or CT-1302 can be effectively mitigated by modifying plant procedures. However, there is still a residual human error of omission or commission associated with failure to open the valve. The HEP associated with only the action to locally open CT-1300 (or CT-1302) was estimated as 1.5E-3, which increases the nominal HEP of 9.7E-4 for the action to align CW backup to the AFW pumps to 2.5E-3. However, in addition to impacting the individual HEP (AFW-XHE-FO-CITYW), combined HEPs (i.e., combinations of dependent operator actions) which involve the action are also impacted. The below table shows the overall list of individual and combined HEPs that are impacted by maintaining CT-1300 or CT-1302 normally closed:

Human Action ID	Description	Previous HEP	New HEP
AFW-XHE-FO-CITYW (HEP-AFW-CITYW)	FAILURE TO ALIGN ABFP CW MAKEUP	9.7E-4	2.5E-3
CHEP-CITYW-HIRS2	AFW-XHE-FO-CITYW * OHHIR-S2	2.23E-6	5.75E-6
CHEP-CITYW-MFBT2	AFW-XHE-FO-CITYW * MFW-XHE-FO-OMFW * PPR-XHE-FO-FBT2	9.77E-6	2.52E-5
CHEP-CITYW-CFBT2	AFW-XHE-FO-CITYW * CDS-XHE-FO-CDPM * PPR-XHE-FO-FBT2	1.04E-5	2.67E-5
CHEP-CITYW-MFWCD	AFW-XHE-FO-CITYW * CDS-XHE-FO-CDPM * MFW-XHE-FO-OMFW	5.96E-5	1.54E-4
CHEP-FBT1-CITYW	AFW-XHE-FO-CITYW * PPR-XHE-FO-FBT1	7.16E-5	1.85E-4
CHEP-FBS2-CITYW	AFW-XHE-FO-CITYW * PPR-XHE-FO-FBS2	7.16E-5	1.85E-4
CHEP-FBT2-CITYW	AFW-XHE-FO-CITYW * PPR-XHE-FO-FBT2	7.16E-5	1.85E-4

In terms of the valve failure, the probability of a manual valve failing to open is 1.92E-4 per demand based on the IP3 PSA, which assumes that CT-1300 and CT-1302 are periodically tested (cycled) to assure their reliability.

Substituting the above HEP, CHEP and valve failure probability values into the latest PSA model of record documented in engineering report PSA-IP3-01, the adjusted Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) values are 1.5415E-05E-5/yr and 5.0086E-07/yr, respectively.

Comparing the above values to the baseline CDF and LERF values in PSA-IP3-01 of 1.5409E-5/yr and 5.0012E-7/yr, respectively, results in an increase in CDF of 6.0E-9/yr and increase in LERF of 7.4E-10/yr.

3.2 Risk Due to Tornadoes

Tornadoes can cause damage to the CST either by direct impingement or due to the generation of missiles. Using terminology from NUREG/CR-4461 [Ref. 9], the total annual probability, P, of a structure, such as the Condensate Storage Tank (CST), being struck by a tornado is equal to the sum of the point strike probability, P_p, and the finite-structure (or life-line) strike probability, P_l. Mathematically, the point and life-line strike probabilities can be expressed by the following equations:

$$P = P_p + P_l = \frac{A_t}{NA_r} + \frac{w_s L_t}{NA_r} \quad (1)$$

where

A_r	=	Area of a region of interest (e.g., Eastern United States or 1° latitude and longitude box
A_t	=	Total area impacted by tornadoes within a region of interest in N years
L_t	=	Total tornado path length in a region of interest regardless of wind speed
N	=	Number of years of tornado record used to determine A_t
w_s	=	Characteristic horizontal dimension of a finite structure

Appendix C of NUREG/CR-4461 provides estimates for the above tornado characteristics for 1° latitude and longitude boxes of interest. The closest representation of IP3's location is the 41° latitude and 74° longitude box. Based on Appendix C of NUREG/CR-4461, the annual tornado point strike probability for IP3 is 7.869E-5/yr. While the annual life-line strike probability (2.275E-5/yr) is also provided in Appendix C, the life-line probability is based on a structure with a horizontal dimension of 200 feet. However, using the above equation for P, the total annual tornado strike probability can be estimated for any finite structure by dividing the life-line strike probability in Appendix C by 200 and multiplying by the applicable plant-specific dimension, w_l, in units of feet.

$$P = P_p + \frac{P_l w_l}{200} \quad (2)$$

For the CST, which has a diameter of approximately 57 feet, the total annual tornado strike probability can therefore be estimated as follows:

$$P = 7.869E\text{-}5 + (2.275E\text{-}5)(57)/200 = 8.52E\text{-}5/yr \quad (3)$$

3.2.1 Tornado Risk Due to Direct Impact

The above value for P represents the frequency, or annual probability, of <u>any</u> tornado strike. However, based on calculation IP3-CALC-STR-00630 [Ref. 10], the CST, anchorage, foundation, and soil bearing pressure are capable of withstanding a design basis tornado with a tangential wind velocity of 300 mph and translational velocity of 60 mph.

The total strike probability for tornadoes with wind speeds ≥ 300 mph) can be estimated from NUREG/CR-4461 using the following equation:

$$P(u \geq u_o) = P_p \cdot exp\left[-\left(\frac{u_o-65}{a_p}\right)^{b_p}\right] + \frac{P_l w_l}{200} \cdot exp\left[-\left(\frac{u_o-65}{a_l}\right)^{b_l}\right] \quad (4)$$

where

$P_p(u \geq u_o)$	=	Total annual probability of a structure being struck by a tornado with wind speeds exceeding some value u
a_l	=	Scale parameter for the Weibull distribution function for the conditional life-line strike probability = 36.65
a_p	=	Scale parameter for the Weibull distribution function for the conditional point strike probability = 24.63
b_l	=	Shape parameter for the Weibull distribution function for the conditional life-line strike probability = 1.507
b_p	=	Shape parameter for the Weibull distribution function for the conditional point strike probability = 1.164
u_o	=	Threshold wind speed or wind speed of interest (mph) = 300

The values for the above Weibull scale and shape parameters were obtained from Table 5-1 in NUREG/CR-4461 for the East region and are assumed to be applicable for estimating the probably of exceedance for IP3. This is considered reasonable given that Figures 5-2 and 5-3 in NUREG/CR-4461 do not show much difference between the conditional point or life-line strike probabilities regardless of region.

Solving Eq. (4) using the above parameters and a CST diameter of 57 feet, the total frequency of a 300-mph or higher tornado directly impacting the CST due from both point strikes and life-line strikes is estimated at 7.94E-11/yr. The 5% lower confidence limit and 95% upper confidence limits were estimated as 3.08E-11/yr and 2.05E-10/yr, respectively. Based on these results, it can be concluded that the probability of a tornado striking the CST at sufficient wind speeds to damage the CST is negligibly small.

3.2.2 Tornado Risk Due to Missiles

The above annual tornado strike probability does not include damage to the CST from tornado generated missiles. While the CST is capable of withstanding a direct strike from tornadoes with wind speeds of 300 mph, damage to the CST is considered possible from lower wind speeds due to the generation of tornado-borne missiles. According to NUREG/CR-5042 [Ref. 6], missiles only begin to be generated during F2 tornadoes, which correspond to wind speeds between 113 and 157 mph. Therefore, it is assumed

that only Class F2 and above tornadoes (i.e., wind speeds greater than 113 mph) can cause damage from generation of missiles.

For tornado missiles, previous studies have concluded that most tornado-generated missiles that strike a plant will originate from within 1000 feet of the target. Assuming the CST can be damaged by missiles generated within 1000 feet of the CST, the frequency of an F2 or higher tornado striking within 1000 feet of the CST was estimated using Eq. (4) but substituting the CST diameter of 57 feet with the missile exposure diameter of 2057 feet (i.e., CST diameter of 57 feet plus 1000-ft radius from the CST). The resulting annual frequency for tornadoes F2 or higher striking within 1000 feet from the CST is 6.11E-5/yr. However, according to NSAC-60 [Ref. 7], SAI computer results of previous studies showed 1 in 18.5 tornadoes crossing a 1-mile-radius plant site caused missile impacts on the plant. Accordingly, the probability per tornado of incurring missile strikes is estimated as 0.0541, which also agrees with a 1978 EPRI study. Thus, the frequency of incurring tornado missile strikes on the CST is estimated as 6.11E-5/yr x 0.0541, or 3.30E-6/yr. The 5% lower confidence limit and 95% upper confidence limits were estimated as 9.08E-8/yr and 2.69E-5/yr, respectively.

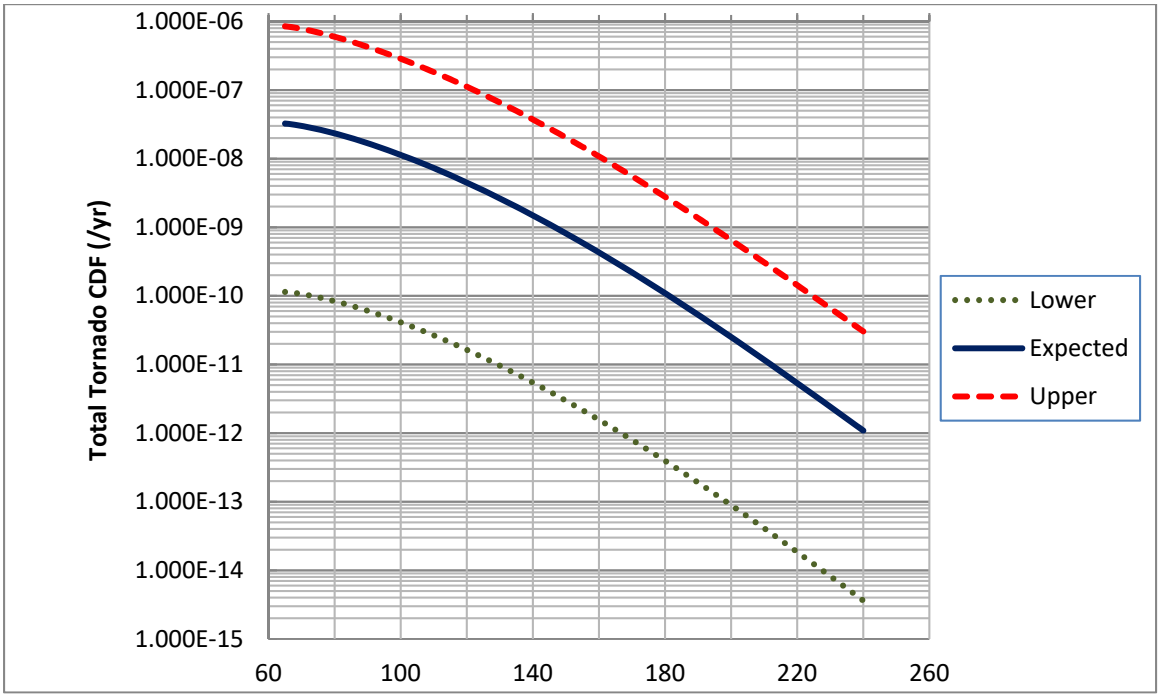
Since the frequency of damage from a direct tornado strike (7.94E-11/yr) is negligible compared to the frequency of damage due to tornado missiles (3.30E-6/yr), the total frequency of tornadoes that could impact the CST, either directly or from the generation of a missile, is therefore 3.30E-6/yr. The nominal HEP associated with not aligning the CW backup to AFW, under the assumption that the CW supply to AFW is normally open up to AOVs PCV-1187 thru 1189, is 9.7E-4. This HEP is conservative because it assumes that the CW backup must be aligned prior to CST depletion and AFW pump auto trip on low suction. In reality, there would be additional time available to align CW and restart the AFW pumps prior to SG dryout. However, to remain consistent with the assumptions used to quantify the HEP for internal events, it was assumed that even in the event that a tornado damages the CST, at least 2.75 feet of CST inventory (corresponding to the CST low-low level setpoint) will be available for AFW pump operation. This assumption is not critical to the risk assessment because the time available to restart the AFW pumps after tripping on low suction, estimated as 40 minutes following a loss of offsite power based on simulator results, is close to the time estimated for the CST to be depleted once reaching the CST low-low level of 2.75 feet, estimated as 48 minutes based on an assumed AFW flow rate of 800 gpm and previous CST low-low level setpoint of 2.5 feet.

Based on feedback from IP3 Operations, the time required to align the CW backup to AFW is estimated to require an additional 15 minutes to locally open the CW supply valve (CT-1300 or CT-1302). Conservatively taking no credit for re-opening CT-1300 (or CT-1302) prior to CST water level decreasing to the low-low level alarm setpoint of 2.75 feet increases the HEP to 1.9E-2. In addition, the probability that the manual valve physically fails to open must be accounted for, which is estimated as 1.92E-4 per demand.

It should be noted that the above frequency is not simply equal to the *core damage* frequency, or CDF, because core damage would still require failure of bleed-and-feed cooling in the event that secondary heat removal (CST and CWT) were unavailable.

The internal events conditional failure probability of bleed-and-feed cooling following a loss of offsite power was estimated as 5.87E-2 by quantifying fault tree gate GFB-T1. Although this value does not account for tornado-induced increases to failure probabilities associated with components needed to support bleed-and-feed cooling, it's still expected that the overall failure probability of bleed-and-feed-cooling would reduce the above tornado damage frequency by approximately an order of magnitude. Therefore, the total core damage frequency (CDF) associated with tornadoes impacting the CST is estimated as 3.30E-6/yr x (1.9E-2 + 1.92E-4) x 0.1, or 6.3E-9/yr.

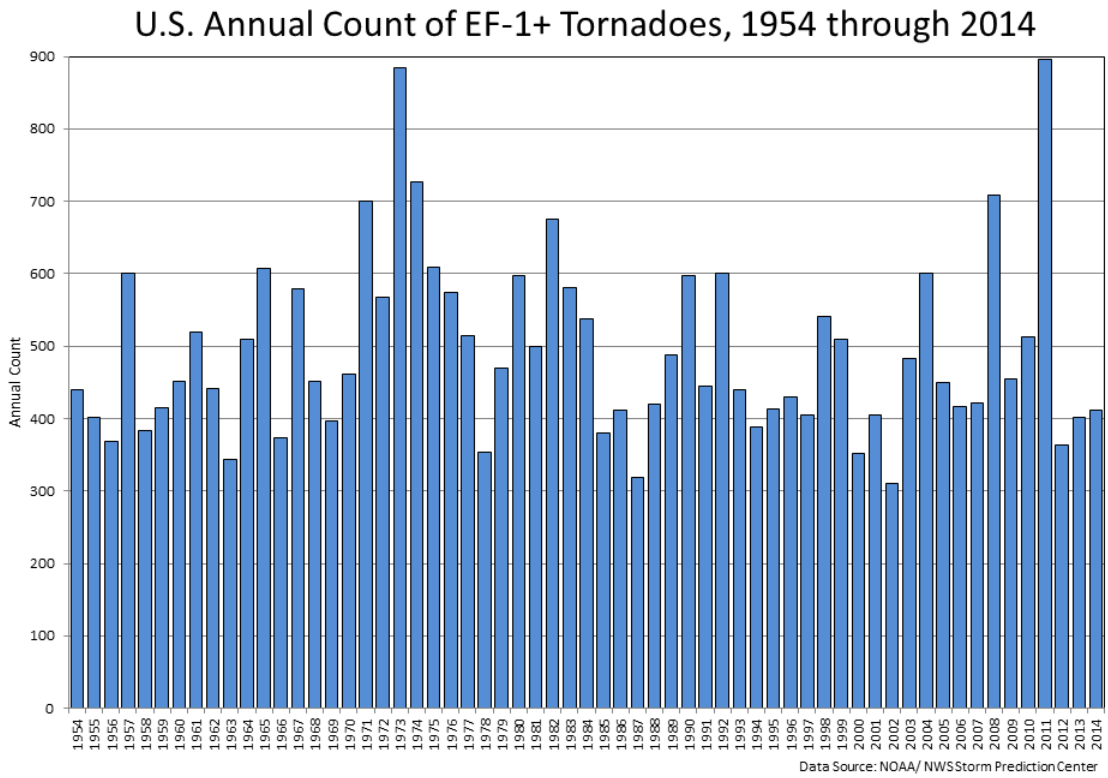
The figure below shows the total tornado CDF as a function of windspeed, as well as the lower and upper bound estimates.



Because neither the tornado frequency nor credit for bleed-and-feed cooling is impacted by the CW surveillance requirement, the <u>increase</u> in CDF associated with a tornado impacting the CST (i.e., 113 mph or higher) and subsequent unavailability of the CW backup is estimated by multiplying the tornado missile strike frequency (3.30E-6/yr) by failure probability of bleed-and-feed cooling (0.1) and difference between HEPs (1.9E-2 – 9.7E-4) associated with aligning CW backup to the AFW pumps, which must also take into account the probability that manual valve CT-1300 (or CT-1302) physically fails to re-open (1.92E-4 per demand). The result equals 3.30E-6/yr x 0.1 x (1.9E-2 - 9.7E-4 + 1.92E-4), or 6.0E-9/yr.

It should be further noted that the above estimate for tornado risk is based on results from NUREG/CR-4461 (Rev. 2), which only included tornado data through August 2003. However, according to the National Climatic Data Center (NCDC), there has been no

upward trend in the number of severe tornadoes, which is supported by the below chart showing the number of EF-1+ tornadoes from 1954 - 2014.



Source: https://www.ncdc.noaa.gov/climate-information/extreme-events/us-tornado-climatology/trends

3.3 Risk Due to High Winds

The CST and CWT are normally about two-thirds full. According to the IPPSS [Ref. 8] and IPEEE, their resultant uniform internal pressures range to over 2,000 psf at the bottom walls. So long as the tanks have such a normal volume of inventory, large external wind pressures cannot develop sufficiently to cause asymmetrical loads that would threaten buckling of the tanks, although the tank top might be blown out from negative pressures. This, however, would not cause failure of the tank walls. It should be noted that Step 2.6 of Attachment 3 to System Operating Procedure 0-SOP-WEATHER-002 [Ref. 5] directs the operators to maximize CST level to the extent possible if the National Weather Service issues a Hurricane Warning for a hurricane with wind speeds in excess of 87 knots (approximately 100 mph).

Also, the frequencies associated with non-tornado wind speeds in the range which could cause severe plant damage are substantially lower than those associated with

tornadoes. In addition, Step 3.2 of Attachment 3 to 0-SOP-WEATHER-002 directs the operators to perform a plant shutdown to hot shutdown conditions prior to the arrival of expected high winds in excess of 87 knots (approximately 100 mph). Such an advance warning is not reliable for tornadoes. High wind induced damage to the CWT and CST are expected to be dominated by tornado events, not high winds or hurricanes.

3.4 Risk Due to Seismic Events

The impact of maintaining the CW supply to AFW suction isolated is considered negligible for seismic events given that the CST has more seismic ruggedness that the CW tank. Therefore, any seismic event which is capable of failing the CST is also likely to fail the CW tank.

3.5 Risk Due to Fires

There are no Appendix R fire scenarios that rely on prompt credit for CW as a suction source for the AFW pump(s) since fires would not impact availability of the CST. Although there are fires which could impact availability of the air-operated valves (PCV-1187, PCV-1188 and PCV-1189), such fires would not impact the risk associated with maintaining CT-1300 or CT-1302 closed since the CW backup to AFW would be rendered unavailable due to the loss of these air-operated valves. Note that the Appendix R safe-shutdown model and methodology do credit the contingent use of CW as an AFW pump suction source, in the event the scenario results in extended AFW operation (typically >24 hours) that results in depletion of the CST. Guidance for opening the air-operated valve(s) to admit CW flow to the selected AFW pump(s) is provided in the post-fire safe-shutdown procedures.

3.6 Potential Frequency for Concurrent Loss of CWT and CST Due to Tornadoes

The CWT is located far away from either plant's CST. Given the large distance between the CST and CWT, and the fact that the average tornado path width is less than 700 feet, the probability of a tornado striking both the CWT and CST is considered remote. However, such an event would render changing the normal position of CT-1300 or CT-1302 a moot point. Therefore, there is no increase in risk due to a tornado (or any event) which results in concurrent loss of both the CST and CW tank.

4.0 PRA QUALITY AND PEER REVIEW F&O CLOSURE

PRA quality aspects are discussed in Appendix C to this attachment, which is based upon the existing documentation in Appendix K2 of engineering report PSA-IP3-01.

5.0 RESULTS

Based on the risk assessment discussed in the above sections, the total increase in core damage frequency (CDF), including both internal events and external events, was estimated as follows:

$$\begin{aligned}\Delta CDF &= \Delta CDF_{Internal} + \Delta CDF_{External} \\ &= \Delta CDF_{Internal} + \Delta CDF_{Tornadoes} \\ &= 6.0E\text{-}9/yr + 6.0E\text{-}9/yr \\ &= 1.2E\text{-}8/yr\end{aligned}$$

For large early release frequency (LERF), the increase in LERF for internal events was estimated as 7.4E-10/yr. It was not possible to accurately estimate the impact from external events on LERF. However, as a worst-case (which is considered to be extremely conservative), the worst-case external events increase in LERF was assumed to be equal to the estimated external events increase in CDF (6.0E-9/yr). Therefore, the worst-case total increaase in LERF (from both internal and external events) is estimated as 7.4E-10/yr + 6.0E-9/yr, or 6.7E-9/yr.

6.0 CONCLUSION

The above estimated increase in CDF (1.2E-8/yr) is well below the CDF screening criteria of 1E-6/yr for permanent TS Changes in accordance with Regulatory Guide (RG) 1.177. The estimated increase in CDF is also less than the LERF screening criterion of 1E-7/yr. Therefore, the TS change to revise SR 3.7.7.2 is considered non-risk significant.

7.0 REFERENCES

[1] "Indian Point Unit 3 Probabilistic Safety Assessment (PSA) – 2018 Periodic Update," PSA-IP3-01, Rev. 0, Indian Point Energy Center, Entergy Nuclear Northeast, October 2018.

[2] "Indian Point Three Nuclear Power Plant Individual Plant Examination of External Events," IP3-RPT-UNSPEC-02182, Rev. 0, New York Power Authority, September 1997.

[3] "PANEL SKF – BEARING MONITOR," Alarm Response Procedure 3-ARP-013, Rev. 48, Indian Point Energy Center, Entergy Nuclear Northeast, April 2019.

[4] ‘PANEL SCF – CONDENSATE AND FEEDWATER," Alarm Response Procedure 3-ARP-006, Rev. 50, Indian Point Energy Center, Entergy Nuclear Northeast, March 2013.

[5] "Severe Weather Preparations," System Operating Procedure 0-SOP-WEATHER-002, Rev. 1, Indian Point Energy Center, Entergy Nuclear Northeast, April 2019.

[6] C. Y. Kimura, et al., "Evaluation of External Hazards to Nuclear Power Plants in the United States – Other External Events," NUREG/CR-5042, U.S. Nuclear Regulatory Commission, February 1989.

[7] "A Probabilistic Risk Assessment of Oconee Unit 3," NSAC-60, Nuclear Safety Analysis Center (NSAC), June 1984.

[8] "Indian Point Probabilistic Safety Study," Power Authority of the State of New York and Consolidated Edison Company of New York, Inc., 1982.

[9] J.V. Ramsdell, Jr. and J.P. Rishel, "Tornado Climatology of the Contiguous United States," NUREG/CR-4461, Revision 2, U.S. Nuclear Regulatory Commission, February 2007.

[10] "Condensate Water Storage Tank," IP3-CALC-STR-00630, Rev. 1, New York Power Authority, May 2001.

Appendix A

Human Error Probability for Aligning CW to AFW Suction (Internal Events)

Tree	Tree Branch	Basic HEP	Time Avail. (minutes)	Recovery Factor(s)	Dep. Level	RF Prob.	Mean HEP
A	a	Negl.					Negl.
B	l	7.5E-4	33	SR & STA	LD	5.1E-2	3.8E-5
C	a	Negl.					Negl.
D	a	Negl.					Negl.
E	c	3.0E-3	33	SR & EC	LD	5.3E-2	1.6E-4
F	a	Negl.					Negl.
G	k	Negl.					Negl.
H	a	Negl.					Negl.
					CBDTM HEP		**2.0E-4**

Notes:

Given that there are 19,067.4 gallons per CST foot and assuming an AFW flow rate of 800 gpm, the time available to align city water prior to CST depletion (0 feet indicated) is approximately of 48 minutes from the time an indicated CST level of 2 feet is reached.

HCR/ORE Method:

HCR/ORE HEP	**1.3E-4**
Cognitive HEP	**2.0E-4**

$$p = 1 - \Phi\left(\frac{\ln[(T_{sw} - T_m)/T_{1/2}]}{sigma}\right)$$

Tsw	48
T1/2	10
Tm	5

sigma 0.4 (Calculated based on answers to questions below)

(Override Value - leave blank if automatic sigma calculation is desired)

Selection of sigma in HCR/ORE method:

Skill or Ruled-Based Action (skill/rule)	Rule
Procedural guidance (simple/complex)	Simple
Simulator training (yes/no)	Yes
Stress (low/high)	High

Critical Task	O/R# **	EOM HEP	EOM Source	ECOM HEP	ECOM Source	Loc ***	Time Avail.	Stress (N/H/E) ?	Stress (N/H/E) x	Complexity (N/MC/HC) ?	Complexity (N/MC/HC) x	Training (H/N/L) ?	Training (H/N/L) x	Recovery (Y/R#/N) ?	Recovery (Y/R#/N) x	Mean HEP
							Performance Shaping Factors (PSFs)*									
Open CT-1300 (or CT-1302) on CST low level (20.66 feet)	O	1.3E-3	20-7,1	3.8E-3	20-13,2	L	L	H	2	N	1	N	1	Y	0.152	1.5E-3
3-SOP-AFW-002, Step 4.4.1 -- OPEN the city water supply to the selected AFP	O	1.3E-3	20-7,1	1.3E-3	20-12,3	C	N	H	2	N	1	N	1	Y	0.147	7.7E-4
														HEP		**2.3E-3**

* Performance Shaping Factors (PSFs)

Time Available:	Tsw: 48	T1/2: 10	Tm: 5	Units: minutes
- VL (Very Long)	t > 6 hours			
- L (Long)	60 minutes < t ≤ 6 hours			
- N (Nominal)	15 minutes < t ≤ 60 minutes			
- S (Short)	5 minutes < t ≤ 15 minutes			
- VS (Very Short)	t ≤ 5 minutes			
- No credit (NC)	Failure probability equals 1.0 due to insufficient time to diagnose and perform action			
Stress:	N = Nominal; H = High; E = Extreme			
Complexity:	N = Nominal; MC = Moderately complex; HC = Highly complex			
Training:	H = High; N = Nominal; L = Low			
Recovery:	Y = Recoverable (based on time available); R# = Recoverable (subsequent procedural step); N = Not recoverable			

** Error Type: Original Execution Error (O) or Recovery (R#)

*** Location of Action: Central Control Room (C) or Local (L)

Appendix B

Human Error Probability for Aligning CW to AFW Suction (Tornadoes)

Tree	Tree Branch	Basic HEP	Time Avail. (minutes)	Recovery Factor(s)	Dep. Level	RF Prob.	Mean HEP
A	a	Negl.					Negl.
B	l	7.5E-4	18	SR & STA	MD	1.4E-1	1.1E-4
C	a	Negl.					Negl.
D	a	Negl.					Negl.
E	c	3.0E-3	18	SR & EC	MD	1.5E-1	4.4E-4
F	a	Negl.					Negl.
G	k	Negl.					Negl.
H	a	Negl.					Negl.
					CBDTM HEP		**5.4E-4**

Notes:

Given that there are 19,067.4 gallons per CST foot and assuming an AFW flow rate of 800 gpm, the time available to align city water prior to CST depletion (0 feet indicated) is approximately of 48 minutes from the time an indicated CST level of 2 feet is reached.

HCR/ORE Method:

HCR/ORE HEP	**5.0E-3**
Cognitive HEP	**5.0E-3**

$$p = 1 - \Phi\left(\frac{\ln[(T_{sw} - T_m)/T_{1/2}]}{sigma}\right)$$

Tsw	48
T1/2	10
Tm	20

sigma 0.4 (Calculated based on answers to questions below)

(Override Value - leave blank if automatic sigma calculation is desired)

Selection of sigma in HCR/ORE method:

Skill or Ruled-Based Action (skill/rule)	Rule
Procedural guidance (simple/complex)	Simple
Simulator training (yes/no)	Yes
Stress (low/high)	High

Critical Task	O/R# **	EOM HEP	EOM Source	ECOM HEP	ECOM Source	Loc ***	Time Avail.	Stress (N/H/E) ?	Stress (N/H/E) x	Complexity (N/MC/HC) ?	Complexity (N/MC/HC) x	Training (H/N/L) ?	Training (H/N/L) x	Recovery (Y/R#/N) ?	Recovery (Y/R#/N) x	Mean HEP
							Performance Shaping Factors (PSFs)*									
Open CT-1300 (or CT-1302)	O	1.3E-3	20-7,1	3.8E-3	20-13,2	L	N	E	5	N	1	N	1	Y	0.513	1.3E-2
3-SOP-AFW-002, Step 4.4.1 -- OPEN the city water supply to the selected AFP	O	1.3E-3	20-7,1	1.3E-3	20-12,3	C	N	H	2	N	1	N	1	Y	0.147	7.7E-4
															HEP	**1.4E-2**

* Performance Shaping Factors (PSFs)

Time Available:	Tsw: 48	T1/2: 10	Tm: 20	Units: minutes
- VL (Very Long)	t > 6 hours			
- L (Long)	60 minutes < t ≤ 6 hours			
- N (Nominal)	15 minutes < t ≤ 60 minutes			
- S (Short)	5 minutes < t ≤ 15 minutes			
- VS (Very Short)	t ≤ 5 minutes			
- No credit (NC)	Failure probability equals 1.0 due to insufficient time to diagnose and perform action			
Stress:	N = Nominal; H = High; E = Extreme			
Complexity:	N = Nominal; MC = Moderately complex; HC = Highly complex			
Training:	H = High; N = Nominal; L = Low			
Recovery:	Y = Recoverable (based on time available); R# = Recoverable (subsequent procedural step); N = Not recoverable			

** Error Type: Original Execution Error (O) or Recovery (R#)

*** Location of Action: Central Control Room (C) or Local (L)

Appendix C

Resolution of Regulatory Guide 1.200 Peer Review Facts and Observations

The RG 1.200 Peer Review was performed in December 2010 using the requirements of RG 1.200 (Revision 2) and the version of the ASME PRA Standard contained in ASME/ANS RA-Sa-2009. The model that was reviewed was the IP3 PSA Level-1 Model as documented in the IP-RPT-10-00023 (Rev. 0). The Westinghouse Owners Group (WOG) issued the final Peer Review report in October 2011. The scope of the RG 1.200 peer review was a full scope internal events review of the IP3 PSA model, including internal flooding.

The RG 1.200 Peer Review team concluded that of the total 326 supporting requirements (SRs) that were applicable to PWRs for internal events (including internal flooding) in the PRA Standard (ASME/ANS RA-Sa-2009), 305 (or 97%) of the applicable supporting requirements were met for Capability Category II. Ten (10) of the supporting requirements were either not met or only met Capability Category I. Note that nine (9) of the ten supporting requirements that were not met pertain to the internal flooding analysis, which is not within the scope of the MSPI application. The comments from the RG 1.200 Peer Review were issued as Facts and Observations (F&Os), with suggested methods for resolution, and included as items in the ENN Model Change Request (MCR) database for tracking and ultimate closure.

This appendix addresses resolution of the eleven (11) Facts and Observations (F&O) from the RG. 1.200 Peer Review. As a result of the 2016 interim PSA model update (IP-RPT-16-00035), all Finding F&Os have been closed. In terms of the peer review Suggestion F&Os, all but two (2) F&Os (2-4 and 5-3) have been closed. These two Suggestion F&Os are documented in MCRs 763 and 777. In addition to the two MCRs related to Suggestion F&Os that still remain open, only three (3) other self-identified MCRs remain open (MCRs 825, 834 and 878). All five (5) remaining open F&Os are documentation issues only or do not impact the estimate of Core Damage Frequency (CDF) or Large Early Release Frequency (LERF).

Table C.1 lists the IP3 RG 1.200 Peer Review Finding F&Os.

Table C.1 Status of IP3 RG 1.200 Peer Review F&Os

F&O #:	1-11
F&O Details:	Finding. Appendix C1 of IP-RPT-10-00023, Rev. 0 provides a high to medium level summary of the flood scenarios and provides greater depth in some areas. Analysis details available to the peer review team, such as flooding calculations, were not sufficient to support upgrades and would have to be obtained or reproduced for future model changes. The documentation also lacks in reference to quantification input documentation (initiator specific flag files).
Basis for Significance:	*Analysis details available to the peer review team such as flooding calculations, were not sufficient to support upgrades and would have to be obtained or reproduced for future model changes. The documentation also lacks in reference to quantification input documentation (initiator specific flag files).*
Associated SR(s):	IFSN-B1 IFSN-B2
Possible Resolution:	*Provide required documentation.*
Status:	CLOSED per MCR 755. All flooding calculations as well as a software user's manual have been turned over to Entergy and have been placed in the electronic backup file folder to be included in the update package in Asset Suite. Appendix C2 has been revised to include a table (Table C2-9) showing the internal event flag files used for each internal flooding initiator. Section C2-1 has been revised to provide the following reference to the flag files themselves: "The flag files used for the internal flooding initiating events are shown in Table C2-9 and are included in the final quantification file package. Those flag files provide the basic event impacts for the modeled components failed by each flood event."
TS SR 3.7.7.2 Impact:	NONE. Although this F&O is a documentation enhancement only which does NOT impact the results, it has been addressed nonetheless.

F&O #:	1-12
F&O Details:	Finding. The walkdown notes in Appendix A of IP-RPT-10-00023, Rev. 0, Appendix C.1 note the general location of each SSC with respect to its room and elevation as well as its submergence height. Some additional general locational information is sometimes identified in Section 4.2 of IP-RPT-10-00023, Rev. 0, Appendix C.1. For example, it may state that a flood source may impact one but not both trains of equipment; specifics are not given as to why both cannot be impacted (e.g., shielding, curbs, etc.), but the information implies the impact of spatial information. There is no specific physical location information related to spray type failures found in the documentation. SSCs are only identified locationally by their flood area and elevation. It cannot be determined which SSCs in any area are susceptible to spray from any specific spray source.
Basis for Significance:	*There is no specific physical location information found in the documentation for SSCs other than flood area and elevation. Therefore, it cannot be determined which SSCs in any area are susceptible to spray from any specific spray source. In the scenario development it identifies which equipment is impacted by spray, but it cannot be determined how that information was obtained or if it is correct.*
Associated SR(s):	IFSN-A5
Possible Resolution:	*For SSCs susceptible to spray failure (also see F&O 2-3), ensure sufficient relational location information between the target SSC and spray sources are provided so that a determination can be made as to whether the SSCs can be damaged by each potential spray source.*
Status:	CLOSED per MCR 756. Additional discussion has been added to the walkdown Appendix to support the spray impacts included in the model. This includes reference to environmental qualification documents where these are used as a basis for stating that equipment would not be vulnerable to spray damage. A conservative separation criterion of 30 feet was used in examining the potential for spray impacts in the analysis. The composite piping and general arrangement drawings were scrutinized to ascertain whether equipment could be sprayed should a line or other piece of equipment rupture. Section 3.2 of Appendix C1 has been changed to note this. Providing additional specific location information within the model documentation will be considered to support future updates (see MCR #825) but is considered a documentation enhancement issue with no expected impact on the analysis.
TS SR 3.7.7.2 Impact:	NONE. Although this F&O is a documentation enhancement only which does NOT impact the results, it has been addressed nonetheless.

F&O #:	1-15
F&O Details:	Finding. The initiating event frequencies are not weighted by the fraction of time the plant is at power. Section 10.9 of Appendix A0 provides guidance to account for plant availability in initiating event calculations. Section 4.0 of Appendix A1 states that the availability factor for the data update period was calculated. However, the calculated value is not incorporated into the initiating event or final CDF results.
Basis for Significance:	*The initiating event frequencies are not weighted by the fraction of time the plant is at power.*
Associated SR(s):	IE-C5
Possible Resolution:	*Include the plant availability factor in the calculation of initiating event frequencies.*
Status:	CLOSED per MCR-759. This is an industry issue with how the plant availability factor should be used. The ASME standard acknowledges this by providing a lengthy and detailed note of explanation. The discussion in Note 1 of this SR states that the adjustment is appropriate "for events at power only (i.e. the scope of PRA covered by this standard)". This implies that the SR applies to the at-power model when used as part of a full all operating state model (when such a model is developed). Entergy does not have an all-modes model and since few such models exist, this SR leads to widespread industry confusion in addressing it (as noted in PWROG report, "Initial Report of Lessons Learned from RG 1.200 Internal Events Peer Reviews"). As Note 1 indicates, regardless of which approach is used for the baseline model, some adjustment would be required depending on the application the PSA model is used to address. We believe our current model meets the SR when Note 1 is taken into consideration.
TS SR 3.7.7.2 Impact:	NONE. Although this F&O is a documentation enhancement only which does NOT impact the results, it has been addressed nonetheless.

F&O #:	3-7
F&O Details:	Finding. The effects of the flood on PSFs were not specifically addressed in the HRA analysis.
Basis for Significance:	*Limited flooding-related human actions are included in the HRA discussion in Appendix H, but there is no mention of any effects of the flood on PSFs.*
Associated SR(s):	IFQU-A6
Possible Resolution:	*Discuss flood effects on PSFs and make adjustments to the HRA analysis if needed.*
Status:	CLOSED per MCR-741. No short-term isolation actions were credited in the flooding analysis. It was assumed, that any isolable flood scenario other than spray event would be isolated within four hours. Given that spray events might be more difficult to identify, any isolable spray events were assumed to be isolated within eight hours. This only impacted the component susceptibility to submergence. The quantification of other actions which are credited for mitigation of internal flood initiators (i.e., actions performed from within the control room, but which are not unique to internal flood initiators) is considered to be similar to that for non-internal flood initiators. The only significant field actions credited in the internal events model that could be impacted by the plant conditions associated with flooding are alignment of alternate cooling to the charging pumps on following failure of the CCW piping in the charging pump foyer and operator actions associated with locally operating the turbine-driven AFW (TDAFW) pump. With respect to CCW piping failure, this event has been added to the model assuming that the operator action to align CW to the charging pumps is precluded (by combining it with flooding initiator IE-FLD-PB-8 has the same impact). Thus, the effects of any HRA impacts on the flood scenarios in this area have been bounded.
TS SR 3.7.7.2 Impact:	NONE. Although this F&O is a documentation enhancement only which does NOT impact the results, it has been addressed nonetheless.

F&O #:	4-14
F&O Details:	Failure modes and success criteria defined in Systems Analysis are consistent with the Data Analysis. This SR also asks for establishing consistent SSC boundaries between the system level analysis and the data analysis. Reviewed Appendix E6 and E27 of the systems notebooks and Appendix D for the Data Analysis. Below is a list of issues identified: 1. System notebooks do not define the component boundaries. The component boundaries are defined by the generic failure rate data source with limited discussions on plant-specific SSC features and modeling considerations. 2. The guidance document Appendix D0 Section 5.10 states "Assure the component boundaries established in the generic data match those defined in the PSA model. Make adjustments or justify differences." Also, Attachment 4, Section 3.0 of the same document states that CCF boundaries are dictated by the fault tree modeling. However, the component boundaries defined for failure rate and CCF data do not match. The justification for using the data that way is that it is the conservative to do so. It is true that this approach is conservative for Emergency Diesel Generators, but it may not be conservative for other cases like batteries and battery chargers where CCF of output breakers are not modeled. 3. Sections 1.2 and 1.4 of Appendix D1 state that the data analysis package is consistent with the system analysis. However, as discussed in Item number 1 above, systems analysis only defines the system boundary and not the component boundaries within the system. 4. Boundaries of the test and maintenance unavailability events are not specifically discussed but seem to be same as the boundaries for the failure rates. Data from the Maintenance Rule program is used for this case, but it is not clear if the system and component boundaries considered in this program is consistent with the PSA model boundaries. Section 6.3.11 of Appendix D0 discusses this issue, but there is no evidence that the analysis done in Appendix D1 considered boundaries applies to routine test and maintenance practices at IP3.
Basis for Significance:	*Based on the documents reviewed and the issues identified, component boundaries are not consistent among failure rate, CCF and unavailability data. Plant-specific features need to be considered for boundary definitions.* *It is possible to ensure that the inconsistent boundary definitions result in conservative results, but realistic rather than conservative results is ideal. CCF events tend to dominate system level cutsets and conservative CCF basic event values may mask other important components in a system.*

Associated SR(s):	DA-A2 DA-D6
Possible Resolution:	*As described in Sections 5.10 and 6.3.11 of Appendix D0, assure component boundaries defined in failure rate and CCF data match the PSA model. Assure the boundaries used in the test and maintenance data is consistent with the PSA model. Make adjustments or provide justification for any mismatch identified.* *Review plant-specific CCF experience for consistency to meet SY DA-D6 requirements.*
Status:	CLOSED per MCR-771. This requirement was met, but the finding resulted from apparent inconsistencies between component boundaries defined in model and generic database boundaries. This led to the perception of a non-conservative impact on CDF. System models and generic databases were reviewed, which confirmed that either system and component boundaries in the model agree, or some additional components in the model overlap the generic database component boundaries. Failure rates for additional components were found to be small - little or no increase in CDF. Model documentation was enhanced to incorporate additional detail to clarify issues with generic database boundaries. Component boundaries defined in Data Analysis, Appendix D are used for system analysis to determine components modeled. Assures system component modeling is consistent with generic data boundaries in data analysis and identification of modeled sub-components, such as input or output breakers, local instrumentation or remote control switches and controls, that included for specific modeling considerations. Sub-components generally in boundaries generic data or implied to be included based on how generic database was developed by INEL. Battery chargers independent failure and common cause failure are modeled as well as input breakers. Generic databases for independent failure and CCF include input and output breakers in boundary definitions so model conservatively overestimates CDF. Battery independent failure and common cause failure are modeled as well as output breakers. Generic CCF data specifically identifies output breakers in boundary. Independent failure database does not. Is reasonable to conclude they were considered during evaluation of plant failure data by INEL when database was developed since independent failure is integral to how CCF data is defined. Therefore conservative modeling occurs for the batteries. For maintenance unavailability boundaries, the Maintenance Rule Basis documents for each system define functions the system must meet and interfacing boundaries between systems. Basis documents were compared to maintenance unavailability terms modeled and system functions are consistent with system models. Basis documents do not

	define component boundaries in the same way as generic databases or the model. System component failures are evaluated in accordance with the basis document system functions and requirements of the Maintenance Rule by system engineers. Unavailable hours are assigned to "monitored components" such as pumps and valves which are the same major components in the model. Therefore, model boundaries agree with or overlap maintenance unavailability boundaries.
TS SR 3.7.7.2 Impact:	NONE. This F&O has been closed. In addition, notwithstanding that this F&O was considered a finding, the peer review team considered the associated SRs (DA-A2 and DA-D6) to meet Capability Category 2.

F&O #:	6-1
F&O Details:	The justification/statement that the CST inventory is sufficient for AFW for 24 hrs should be enhanced.
Basis for Significance:	*The justification/statement that the CST inventory is sufficient for AFW for 24 hrs should be enhanced. IP-RPT-10-00023, Rev. 0, Appendix B, Section B1.3.1.3.2 states early that CST inventory is sufficient for 24 hrs while later reveals that the MAAP analysis shows insufficient CST inventory with statement that alignment to the CW supply may be required. An informal calculation with the minimum flow requirement in EOP concludes that "it would seem that there is enough inventory in the CST to allow the AFW system to operate for 24 hours". Then in IP-RPT-10-0023, Section Insights states that 'As the normal CST inventory is sufficient to supply the AFW pumps for the 24-hour mission time in the PSA', no credit is taken for the alternate suction path from CW supply.*
Associated SR(s):	SC-B1 SY-B11
Possible Resolution:	*Perform rigorous evaluation/justification of the CST inventory to support 24-hour AFW operation.*
Status:	CLOSED per MCR-783. Previous justification of CST water inventory to support 24 hours of secondary-side cooling was based on MAAP Cases IP3-CST-1 and minimum flow requirements for AFW System found in Emergency Operating Procedure ECA-0.0, Loss of All AC Power. The Peer Review Team determined that this information was not 'rigorous' enough and recommend that additional evaluation for CST water inventory lasting for 24 hours should be provided. Hence, to address the Peer Review Team F&O, reference is now made to a June 2004 Westinghouse calculation in support of IP3 power uprate project. The results of this calculation (along with initial calculation boundary conditions) are used to document adequate CST water inventory supply to support AFW operation for secondary-side cooling for 24 hours. Sections B1.3.1.3.2 "Auxiliary Feedwater System" included the following statements: The auxiliary feedwater system pumps are normally aligned to take suction from the CST. Hence, to fulfill the engineered safeguard feature design functions, sufficient feedwater must be available during transient or accident conditions to enable the plant to be placed in a safe shutdown condition. The limiting transient with respect to CST inventory requirements is the loss-of-offsite transient (LOOP). The IP3 licensing basis requires that, in the event of a LOOP, sufficient CST useable inventory must be available to bring the unit from full-power to hot-standby conditions and maintain the plant at hot standby for 24 hours. The required CST inventory is a function of plant-rated power and other NSSS design parameters. In WCAP-16212-P, an analysis was performed to document the required CST inventory for the range of NSSS

	design parameters approved for the power uprate conditions [Reference B1-89]. This analysis is based on the following conservative assumptions: • Reactor trip occurs from 102 percent of rated core power (3216 MWt), from a low-low water level in the steam generators. A two second delay is assumed before reactor trip following LOOP. • Steam is released from the steam generators at the first safety valve setpoint plus setting tolerance for drift. • The steam generators are filled back up to 52-percent narrow range water level. • The CST operating fluid temperature is at the maximum allowable value (120°F). The analysis concluded that a minimum required useable inventory of 292,200 gallons is required to meet the plant licensing bases for the range of NSSS design parameters approved for SPU. Hence, the CST Technical Specification requirement of 360,000 gallons ensures a usable volume of 292,200 gallons. Therefore, CST inventory is not a limiting condition for auxiliary feedwater system operation. Section B1.3.1.7, "Condensate Storage Tank Depletion", was re-written as follows: The IP3 plant has one condensate storage tank (CST) located outdoors and has a maximum capacity of 600,000 gallons, of which 360,000 gallons are reserved for use by the auxiliary feedwater system (Technical Specification 3.7.6). The CST is provided with redundant level indication, control and isolation devices to assure that the tank total inventory capacity does not fall below 360,000 gallons in the event of a single active failure. If the level in the CST reaches a pre-set value (18.77 feet), an interlock will close redundant level control valves (LCVs) 1158-1 and 1158-2 and isolate the normal flow of condensate to the condenser hotwell. If the level in the CST reaches a value corresponding to a volume of 360,000 gallons, the normal flow of condensate to the condenser hotwell is isolated by level control valves (LCVs) 1158-1 and 1158-2 (an alarm at 19.77 feet and interlock at 18.77 feet (385,000 gallon) [Section 2.2.3 of Reference B1-73] to preserve this minimum total inventory [Section 2.2.3 of Reference B1-73] insure compliance with Technical Specification 3.7.6). The elevation of the CST is such that sufficient Net Positive Suction Head (NPSH) is available.
TS SR 3.7.7.2 Impact:	NONE. This F&O has been closed. In addition, notwithstanding that this F&O was considered a finding, the peer review team considered the associated SRs (SC-B1 and SY-B11) to meet Capability Category 2.

F&O #:	6-6
F&O Details:	Finding. Supporting requirement IFSO-A4 is intentionally not met as stated in IP-RPT-10-00023, Rev. 0, Appendix C1, Section 3.3: 'The one supporting requirement of the ASME standard that we have made no attempt to meet is IF-B2: "for each potential source of flooding, identify the mechanisms that would result in a flooding release". In this analysis, no distinction was made between the various causes of floods because the rupture frequencies used included all floods."
Basis for Significance:	*This supporting requirement is intentionally not met as stated in IP-RPT-10-00023, Rev. 0, Appendix C1, Section 3.3: 'The one supporting requirement of the ASME standard that we have made no attempt to meet is IF-B2: "for each potential source of flooding, identify the mechanisms that would result in a flooding release". In this analysis, no distinction was made between the various causes of floods because the rupture frequencies used included all floods."*
Associated SR(s):	IFSO-A4
Possible Resolution:	*Identify the flooding mechanisms that would result in a release for each potential source of flooding to meet the SR.*
Status:	CLOSED per MCR-787. The intent of the statement in the report was to acknowledge that the EPRI data used included all rupture mechanisms that contribute to piping system failures and to note there are no readily available data that would allow us to distinguish between different release mechanisms. The identification of specific causes of failure is therefore a documentation issue. The only contributor not included in the EPRI data is human induced flooding events. Since no applicable generic data exists related to human induced events, plant specific condition reports were reviewed for applicable events (none were identified) and discussions were held with plant operations personnel. Based on those discussions, activities that could challenge system integrity such as large scale movements of water and plant modifications are typically performed during outages and would not constitute significant contributors to flooding risk. Nonetheless, the model documentation has been modified to specifically discuss both failure mechanisms and the conclusions of these human induced failure evaluations. See Section 3.1.2 for a general discussion and individual scenario descriptions in Section 4.2 for scenario specific information. In addition, Section 3.3 has been revised to reflect the above, and Table 3.3.1.1 which is redundant to and superseded by the self-assessment provided in Appendix K has been removed from Appendix C1.
TS SR 3.7.7.2 Impact:	NONE. Although this F&O is a documentation enhancement only which does NOT impact the results, it has been addressed nonetheless.

F&O #:	6-7
F&O Details:	Finding. As stated in IP-RPT-10-00023, Rev. 0, Appendix C1, Table 3.3.1.1 for IFSO-A5, maximum flow rate resulting from a guillotine rupture is determined and used, instead of identifying the characteristic of release for different failure mechanism.
Basis for Significance:	*As stated in IP-RPT-10-00023, Rev. 0, Appendix C1, Table 3.3.1.1 for IFSO-A5, maximum flow rate resulting from a guillotine rupture is determined and used, instead of identifying the characteristic of release for different failure mechanism. This is in contrary to the SR.*
Associated SR(s):	IFSO-A5
Possible Resolution:	*Identify the characteristic of release for each source and its identified failure mechanism.*
Status:	CLOSED per MCR-788. The Peer Review finding was based on limited information provided in Table 3.3.1.1. In fact, as noted in SR, various release types were considered in Section 4 of the internal flood analysis. The evaluated breaks include guillotine, major flood, flood and spray failures. Flow rates and capacities, where applicable were also provided. Additional information has been added to the specific scenarios in Section 4.2 to address item (d) of that SR (i.e. pressure and temperature of the source).
TS SR 3.7.7.2 Impact:	NONE. Although this F&O is a documentation enhancement only which does NOT impact the results, it has been addressed nonetheless.

F&O #:	6-8
F&O Details:	Finding. IP-RPT-10-00023, Rev. 0, Appendix C1, Section 4.1.3 states that the potential flood sources were identified by walkdowns and the examination of drawings, and listed in Appendix A, Plant Walkdown. However, Appendix A does not provide adequate information on flood source as (1) some flood areas are not included in the walkdown such as 3PAB41-1A, 43-60A, 46-73A, 55-63A, 3FH72-B, 3FH80-A, etc.; (2) Appendix A has stressed that the walkdown notes do NOT provide a definitive listing of all equipment and lines or other flood sources. Also other fluid sources have not been considered in the analysis.
Basis for Significance:	*IP-RPT-10-00023, Rev. 0, Appendix C1, Section 4.1.3 states that the potential flood sources were identified by walkdowns and the examination of drawings, and listed in Appendix A, Plant Walkdown. However, Appendix A does not provide adequate information on flood source as (1) some flood areas are not included in the walkdown such as 3PAB41-1A, 43-60A, 46-73A, 55-63A, 3FH72-B, 3FH80-A, etc.; (2) Appendix A has stressed that the walkdown notes do NOT provide a definitive listing of all equipment and lines or other flood sources. Also other fluid sources have not been considered in the analysis.*
Associated SR(s):	IFSO-A1 IFSO-B1 IFSO-B2 IFSO-A3 IFSO-A6
Possible Resolution:	*Identify the potential sources of flooding for each flood area per the standard.* *Perform and document walkdowns for missed flood areas. If these areas cannot be walked down for operational or health reasons, other methods of obtaining this data (e.g., plant drawings, operator interviews, etc.) should be employed and documented.* *Prepare an integrated list of the internal flood source.*
Status:	CLOSED per MCR-789. This was a documentation issue. All accessible fire areas were included in the plant walkdowns. The statement in the introduction to the walkdown notes was intended only to acknowledge that there might be small bore, field run piping (less than 1 inch diameter) that were not shown on system drawings and would not have been confirmed by the walkdown. Such small bore pipes were not considered to be significant flood sources. Appendix A has been revised to include the areas that were omitted from the original documentation, including those areas mentioned in the finding. Table 4.2.1.1 has been included listing how flood zones are addressed. The statement in the preface to Appendix A is changed to read "It should further be noted that the listing of equipment and lines is complete in so far as these are shown on plant drawings. While it is possible that small diameter field-run piping might be excluded we are unaware of any that is."
TS SR 3.7.7.2 Impact:	NONE. Although this F&O is a documentation enhancement only which does NOT impact the results, it has been addressed nonetheless.

F&O #:	6-11
F&O Details:	Finding. IP-RPT-10-00023, Rev. 0, Appendix C, Section 4.1.3, which is the section in the main report for flood sources, just refers Appendix A, Plant Walkdown for the information. There is no list of the internal flood sources in the analysis that may facilitate PRA applications, upgrades, and peer review.
Basis for Significance:	*There is no list of the internal flood sources in the analysis that may facilitate PRA applications, upgrades, and peer review.* *It could facilitate applications, update and review if sources were identified in the main report.*
Associated SR(s):	IFSO-B1
Possible Resolution:	*Prepare an integrated list of the internal flood source.*
Status:	CLOSED per MCR-792. Table 4.2.1.1 has been added to the internal flooding analysis to identify flood sources for each flood zone including flood propagation into the flood zone.
TS SR 3.7.7.2 Impact:	NONE. Although this F&O is a documentation enhancement only which does NOT impact the results, it has been addressed nonetheless.

F&O #:	6-12
F&O Details:	Finding. IP-RPT-10-00023, Rev. 0, Appendix C identifies applicable flood sources in its Appendix A, Plant Walkdown, which is not adequate for process documentation purpose. For example, the walkdown notes stressed that they do NOT provide a definitive listing of all equipment and lines or other flood sources; there is no list of sources to be examined.
Basis for Significance:	*IP-RPT-10-00023, Rev. 0, Appendix C identifies applicable flood sources in its Appendix A, Plant Walkdown, which is not adequate for process documentation purpose. For example, the walkdown notes stressed that they do NOT provide a definitive listing of all equipment and lines or other flood sources; there is no list of sources to be examined.*
Associated SR(s):	IFSO-B2
Possible Resolution:	*Provide adequate documentation on the process used to identify applicable flood sources.*
Status:	CLOSED per MCR-793. As noted in response to F&O 6-8, the statement in the introduction to the walkdown notes was intended only to acknowledge that there might be small bore, field run piping (less than 1 inch diameter) that were not shown on system drawings and would not have been confirmed by the walkdown. Such small bore pipes were not considered to be significant flood sources. Section 3.1.2 FLOOD SOURCES of the Internal Flooding analysis states, "Potential flood sources were identified from drawings, walk-downs, and lists of systems and equipment in each flood zone." Additional description has been added to that section regarding flood sources and Table 4.2.1.1 has been added to the internal flooding analysis to identify flood sources for each flood zone including flood propagation into the flood zone.
TS SR 3.7.7.2 Impact:	NONE. Although this F&O is a documentation enhancement only which does NOT impact the results, it has been addressed nonetheless.

ATTACHMENT 5 to ENCLOSURE

NL-19-093

List of Regulatory Commitments for Proposed Changes to
Indian Point Nuclear Generating Unit 3 Technical Specifications (TS)

The following table identifies those actions committed to by Entergy in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

Commitment	Type (check one)		Scheduled Completion Date
	One-Time Action	Continuing Compliance	
NL-19-093-01: Revise plant procedures to require the re-opening (or verification of open status) of the closed backflow preventer isolation valve (CT-1300 or CT-1302) as part of actions required in response to a CST Trouble Alarm, CST Lo-Lo Level Alarm, issuance of a tornado warning from the National Weather Service, inoperable CST, or as part of placing CW System in service for conditions in which control room is unavailable or in response to a loss of secondary heat sink.		✓	As part of approved LAR Implementation