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NL-14-046

April 22, 2014

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

SUBJECT: Response to Request for Additional Information Regarding Containment Integrity Analysis (TAC NOS. MF0590 and MF0591)
Indian Point Unit Numbers 2 and 3
Docket Nos. 50-247 and 50-286
License Nos. DPR-26 and DPR-64

REFERENCES:

1. NRC Letter to Entergy, Request for Additional Information Regarding Containment Integrity Analysis (TAC NOS. MF0590 and MF0591), dated March 18, 2014
2. Entergy Letter NL-13-058 to NRC, Response to Request for Additional Information Regarding Containment Integrity Analysis (TAC NOS. MF0590 and MF0591), dated August 21, 2013
3. NRC Letter to Entergy, Request for Additional Information Regarding Containment Integrity Analysis (TAC NOS. MF0590 and MF0591), dated June 28, 2013.
4. Entergy Letter NL-13-066 to NRC, Response to Request for Additional Information Regarding Proposed Change to the Technical Specification for RWST Temperature and Containment Pressure in Containment Integrity Analysis (TAC NO. MF0591), dated April 29, 2013
5. NRC Letter to Entergy, Request for Additional Information Regarding Revisions To Refueling Water Storage Tank Temperature and Containment Pressure in Containment Integrity Analysis (TAC NO. MF0591), dated April 8, 2013
6. Entergy Letter NL-13-002 to NRC, Proposed Technical Specification Bases Changes to Credit Four Fan Cooler Units in Containment Integrity Analysis, Indian Point Unit 2, dated January 28, 2013.
7. Entergy Letter NL-13-003 to NRC Regarding Proposed Technical Specification Changes Regarding RWST Temperature and Containment Pressure in Containment Integrity Analysis, dated January 28, 2013

A001
NRR

Dear Sir or Madam:

Entergy Nuclear Operations, Inc., (Entergy) is hereby providing the attached response to the NRC request for additional information, Reference 1, associated with the proposed changes to the Indian Point 2 and 3 Technical Specifications in References 6 and 7. The responses to the request for additional information are provided in the Attachment.

A copy of this response and the associated attachment is being submitted to the designated New York State official in accordance with 10 CFR 50.91.

There are no new commitments being made in this submittal. If you have any questions or require additional information, please contact Mr. Robert Walpole, Manager, Regulatory Assurance at (914) 254-6710.

I declare under penalty of perjury that the foregoing is true and correct. Executed on April 22, 2014.

Sincerely,

D. May for J. Vernon

JAV/ai

Attachment: Response to Request for Additional Information Regarding Containment Integrity Analysis

cc: Mr. Douglas Pickett, Senior Project Manager, NRC NRR DORL
Mr. William Dean, Regional Administrator, NRC Region 1
NRC Resident Inspectors Office
Mr. John B. Rhodes, President and CEO, NYSERDA
Ms. Bridget Frymire, New York State Dept. of Public Service

ATTACHMENT TO NL-14-046

# RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING CONTAINMENT INTEGRITY ANALYSIS

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NOs. 2 and 3
DOCKET NOs. 50-247 and 50-286

Question – Indian Point Unit Nos. 2 and 3

TS LCO 3.6.5 for both Indian Point Units 2 and 3 specify the range of containment air temperature during Modes 1 through 4 between 50°F and 130°F. In support of a recent license amendment request, sensitivity analysis performed by a licensee for the peak containment pressure during a large break LOCA with respect to the initial containment air temperature indicated that the peak containment pressure is greater when using an initial containment temperature less than the maximum TS allowable due to the effect of higher density of non-condensable at the lower temperature. In that case, the effect of using the initial containment air temperature of 98°F versus the maximum TS value of 135°F increased the peak containment pressure by 1.3 psi. The same is also possible for Indian Point Units 2 and 3 because a higher density of non-condensable at 50°F would have a greater mass compared to the same at 130°F, and therefore may result in a higher peak containment pressure. Please provide results of large break LOCA peak containment pressures, including pressure profiles, for initial containment air temperatures of 50°F and 130°F while assuming the remaining input parameters and assumptions remain the same in both cases.

Response – Indian Point Unit Nos. 2 and 3

In response to the above RAI, Westinghouse was contracted to perform a sensitivity study on the impact to peak containment pressure with containment initial temperatures of 50°F and 130°F. With respect to peak containment pressure, both Indian Point Units are limited by the double ended pump suction break (DEPS) with minimum ECCS and containment safeguards in operation. Thus, only the DEPS break was reanalyzed for IP2 for the lower initial containment temperature. The two cases analyzed are:

- Containment and heat sinks at 130 °F (design case) and
- Containment and heat sinks at 50°F (sensitivity study)

The results are shown in the Table below, and a comparison of the pressure profiles are shown in the Figure on the next page. A significant reduction (>3 psi) in peak containment pressure is attained with the lower initial containment temperature. For the DEPS break, the peak pressure occurs in the post-reflood period. Consequently, while the colder initial air temperature does contribute to a higher air partial pressure as seen in the Figure, this is more than offset by the colder heat sinks, which are able to absorb a greater amount of heat over the long-term transient. A similar result would be expected for IP3. Further, the sensitivity study included additional conservatisms by assuming the accumulator water temperature remained at 130°F, and the Refueling Water Storage Tank and Service Water temperatures remained at the TS maximum allowable value. Lower temperatures for these parameters would enhance the performance of the containment spray system and the fan cooler units. This would result in an even lower peak containment pressure.

| INDIAN POINT UNIT 2 – SENSITIVITY TO INITIAL AIR AND CONTAINMENT STRUCTUAL TEMPERATURE ASSUMED IN THE LOCA CONTAINMENT INTEGRITY ANALYSIS | | |
|---|---|---|
| Break Location | Air at 130°F/Structures at 130°F (Design case) | Air at 50°F/Structures at 50°F (Sensitivity study) |
| Double Ended Pump Suction (DEPS) Break with Minimum ECCS flows | 45.44 psig at 1365 seconds | 41.58 psig at 1369.9 seconds |

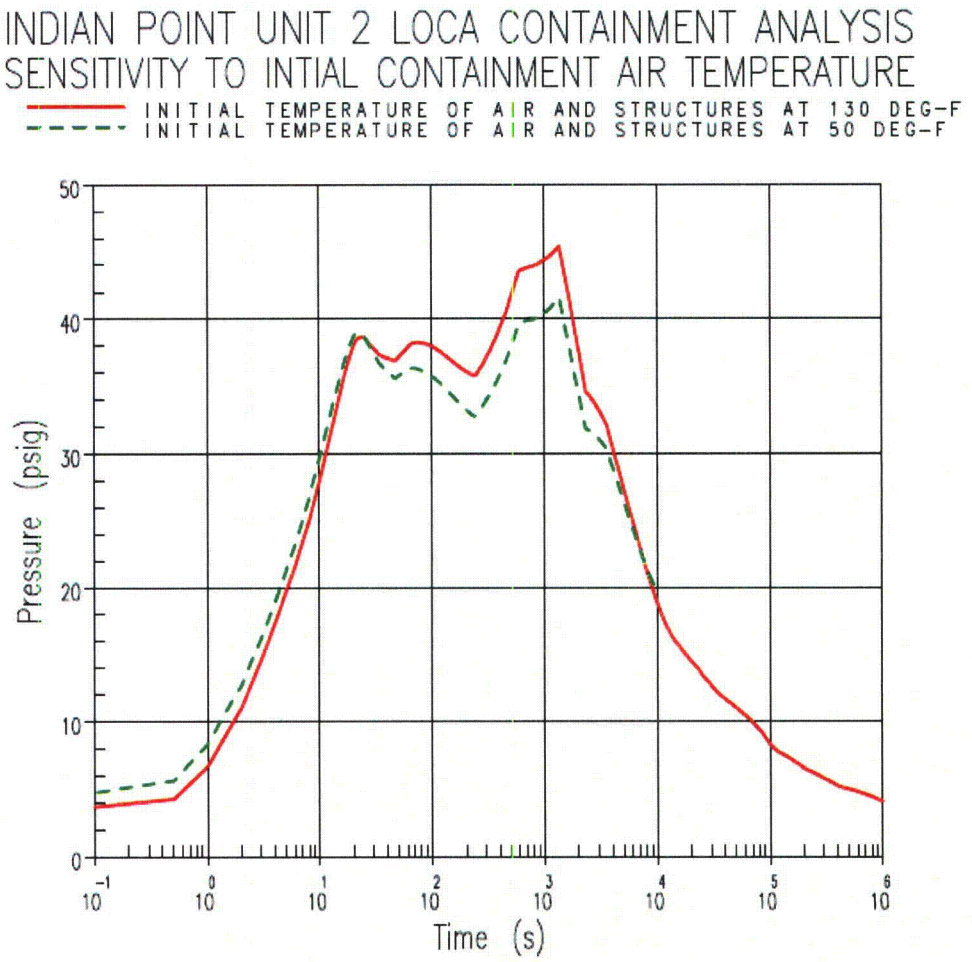


Figure
INDIAN POINT UNIT 2 DOUBLE ENDED PUMP SUCTION BREAK
SENSITIVITY TO INITIAL AIR TEMPERATURE

Question - Indian Point Unit No. 3

Reference 2, page 5 of Attachment 1, describes how containment pressure will be monitored from a locally mounted, highly accurate containment pressure instrument during hot weather conditions. Please describe (1) whether this will be a safety-related instrument and (2) where the instrument will be located.

Surveillance Requirement 3.6.4.1 requires containment pressure to be monitored every 12 hours. Considering that the highly accurate containment pressure instrument will need to be monitored outside control room, please provide the following information regarding operator actions to perform the surveillance requirement:

1. Describe any required operator actions (other than in the proposed TSs) that will be needed to support implementation of this license amendment request.
2. Are there any additions to, deletions or changes to current operator actions required to support this license amendment request? If so, please describe.
3. If there are changes or additions to operator actions, are there any impacts on the time available for operators to complete the actions?
4. How will the operators read and log the containment pressure readings from the locally mounted controls? Will any required actions be performed by more than one operator? Will it require coordination with the Control Room? Please describe.
5. On the summer days when the local readings are assumed to be more accurate, will staffing numbers be increased to account for operators taking readings from the locally mounted instrument?
6. Describe any changes to normal, abnormal or emergency operating procedures as a result of implementation of this change.
7. Describe any necessary training associated with this change.

Response - Indian Point Unit No. 3

Two high accuracy safety related containment pressure indicators have been installed at elevation 41 Ft of the Fan House in the IP3 Primary Auxiliary Building. Further, the following operator actions and training have been implemented to perform the surveillance requirement:

1. The proposed TSs require operator actions to maintain containment pressure ≤ 1.5 psig if RWST temperature is >95°F or containment temperature is >125°F. The containment temperature is monitored and logged every 12 hours by the Reactor Operator (RO) from an indicator in the Control Room. There is a reading detail in the Control Room TS Rounds Sequence 202 for Containment Temperature Indicator TI-1416 that states "Per Engineering Change (EC) 40699, if temperature exceeds 115°F notify the Control Room Supervisor (CRS) to initiate a special log to monitor VC Pressure using local gauges at rack 24 in PAB."
   The RWST temperature is monitored and logged every 12 hours by the Nuclear Plant Operator (NPO) while performing the Field TS Rounds. There is a reading detail in the Field TS rounds Sequence 9 for RWST Temperature that states "Per EC-40699, if RWST temperature exceeds 95°F notify the Control Room Supervisor (CRS) to initiate a special log to monitor VC Pressure using local gauges at rack 24 in PAB."
   The monitoring of these indications in the special log would initiate actions to maintain containment pressure in accordance with the proposed LCO 3.6.4.

2. Operator actions in support of this license amendment request are currently being administratively implemented as follows (see #6):
   - When RWST temperature is ≤90°F or containment temperature is ≤115°F a containment purge would be performed before control room readings of containment pressure reached approximately 1 psig.
   - When RWST temperature is >90°F or containment temperature is >115°F a containment purge would be performed before local indicator readings of containment pressure reached approximately 1 psig.
3. There is no additional impact for time available for operators to complete the actions, since the Control Room Rounds are taken every 12 hours and the NPO rounds are also taken every 12 hours. The local pressure indicators are on the route that would be taken for Nuclear NPO rounds, and would not impact the time available for operators to complete any actions. The regular monitoring of the containment temperature and RWST temperature via the RO/NPO rounds provides sufficient warning of when appropriate actions need to be implemented to comply with the proposed TS.
4. When the CRS is informed by the reactor operator (RO) that VC temperature is elevated, or when the CRS is informed by the NPO that RWST temperature is elevated, the special log will be created and the NPO will enter the local pressure indicator values in the special log. The CRS will then take appropriate actions for containment purging so as to be in compliance with the proposed TS.
5. The additional readings of containment pressure on the local indicators do not impose a burden on operators and the normal watch complement has already been performing these actions when needed.
6. In accordance with the License Amendment Request for Technical Specification 3.6.4, the following was added to Precautions and Limitations of System Operating Procedure 3-SOP-CB-003, Containment Pressure Relief and Purge Systems Operation and to 3-SOP-CB-010, Containment Recirculation Fan Cooler Unit Operations:

   IF RWST temperature > 90°F OR VC temperature >115°F, THEN VC pressure SHALL be administratively maintained between -0.5 psig and +1.0 psig to satisfy requirement that VC pressure SHALL be ≤ +1.5 psig, using local VC narrow range pressure indicators PI-948D and PI-948E.

   Further, a new step 4.1.8 was added to 3-SOP-CB-010:

   WHEN in Modes 1,2,3 and 4, AND containment average temperature on TI-1416 is greater than 115°F, THEN MAINTAIN VC Pressure between -0.5 psig and +1.0 psig using local VC narrow range pressure indicators PI-948D and PI-948E as per 3-SOP-CB-003, Containment Pressure Relief and Purge Systems Operation.

7. The following Training related actions were taken as a result of this change:

   - The Unit 3 Vapor Containment System Description Training Module was revised to include the following:

   The existing IP3 Tech Spec limits for VC pressure are ≥ -2.0 psig to ≤ +2.5 psig, per Tech Spec 3.6.4. However, as documented in Tech Spec LAR, Letter No. NL-13-003, the Tech Spec limits for VC pressure have been revised to ≥ -2.0 psig to ≤ +1.5 psig, if RWST temperature > 95°F or VC temperature > 125° F.

This change is in support of the revised Westinghouse Accident Analysis, CN-CRA-11-34, "Indian Point Unit 3 Loss of Coolant Accident (LOCA) mass and energy re-analysis for NASL-11-5 issues and containment peak pressure margin recovery". VC pressure is one of the design conditions used as inputs to the accident analysis, and the revised analysis assumes a maximum initial (pre-accident) VC pressure of ≤ +1.5 psig, if RWST temperature > 95°F or VC temperature > 125°F.

The previously installed VC pressure indication loops (PI-948A, B, C and PI-949A, B, C) have too large an uncertainty (inaccuracy) to support Operations in performing VC pressure reliefs to maintain VC pressure ≤ +1.5 psig, when required (Ref: SIPD-1674). Therefore, a more accurate means of monitoring VC pressure is required to be in service

Two (2) new local pressure gauges, PI-948D and PI-948E, have been installed on the VC pressure sensing lines of VC pressure transmitters PT-948B and PT-948C, located on Rack 24, at Elevation 41' of the IP3 Primary Auxiliary Building (PAB), in the pipe penetration area.

The new pressure gauges will have an accuracy of +/- 0.5 psig or better, which will enable Operations, when required, to monitor VC pressure on their rounds, and perform a VC pressure relief when the indicated (as-read) VC pressure is ≥ +1.0 psig. Note that the VC pressure relief may be performed at any pressure below +1.0 psig, but must be performed if the VC pressure reads ≥ +1.0 psig.

Two new root isolation valves, SI-1816D (for PI-948D) and SI-1816E (for PI-948E) are also being provided under this EC. These root isolation valves can be closed to isolate PI-948D and/or PI-948E from their respective loops in the event of a failure or if maintenance is required.

The function of new pressure gauges PI-948D and PI-948E will be to provide Operations with a more accurate means of monitoring VC pressure, when needed, in order to maintain VC pressure ≤ +1.5 psig (≤ 1.0 psig indicated) by performing VC pressure reliefs.

The Operator Rounds (IP3 Field TS Rounds, IP3 CCR TS Rounds and IP3 Special Logs) have been revised to incorporate this EC. Monitoring of VC pressure on Operator Rounds using new pressure gauges PI-948D and PI-948E will be required only when indicated values of RWST temperature ≥ 90° F or VC temperature ≥ 115°F.

- The Licensed Operator Requalification Training Lesson Plan includes information on this pending Technical Specifications change

- The Initial Licensed Operator Lesson Plan I3LP-ILO-VCVCB, Vapor Containment Building was revised to include the following discussion under Pressure Detectors:

PI-948 D & E provide narrow range indication (tap off 948 B & C respectively)

Notes:
The revised Westinghouse IP3 Accident Analysis CN-CRA-11-34 is based on an initial (pre-accident) VC pressure of +1.5 psig, instead of the +2.5 psig assumed in the

previous accident analysis, if RWST temperature > 95° F or VC temperature > 125° F. The installed VC pressure indication loops have too large an uncertainty (accuracy) to support operations in performing VC pressure reliefs to maintain VC pressure +1.5 psig when required.