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August 3, 2012

NL-12-108

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

SUBJECT: Supplement to Proposed License Amendment Regarding Atmospheric Dump Valves (TAC No. ME8570)
Indian Point Unit Number 3
Docket No. 50-286
License No. DPR-64

REFERENCES:
1. Entergy Letter, NL-12-039, to NRC regarding Proposed License Amendment on Atmospheric Dump Valves, dated May 23, 2012
2. NRC Letter Requesting Supplemental Information Needed for Acceptance of Requested Licensing Action Regarding Operability of Atmospheric Dump Valves (TAC No. ME8750), dated July 19, 2012

Dear Sir or Madam:

Entergy Nuclear Operations, Inc, (Entergy) requested a License Amendment, Reference 1, to Operating License DPR-64, Docket No. 50-286 for Indian Point Nuclear Generating Unit No. 3 (IP3). The proposed amendment revised Technical Specification 3.7.4 limiting condition for operation to require four rather than three atmospheric dump valves. On July 19, 2012 the NRC staff identified the need for additional information to complete their acceptance review (Reference 2). Entergy is supplementing the original submittal with additional information in response to this request (see Attachment).

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

A001
NRR

I declare under penalty of perjury that the foregoing is true and correct. Executed on August 3, 2012.

Sincerely,

Patrick W. Conway acting for John A. Ventosa

JAV/sp

Attachment: Supplemental Information on Proposed License Amendment Regarding Atmospheric Dump Valves

cc: Mr. Douglas Pickett, Senior Project Manager, NRC NRR DORL
Mr. William Dean, Regional Administrator, NRC Region 1
NRC Resident Inspector, IP3
Mr. Francis J. Murray, Jr., President and CEO, NYSERDA
Ms. Bridget Frymire, New York State Dept. of Public Service

ATTACHMENT TO NL-12-108

SUPPLEMENTAL INFORMATION ON PROPOSED LICENSE AMENDMENT REGARDING ATMOSPHERIC DUMP VALVES

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

The NRC's acceptance review of the Entergy license amendment application of May 23, 2012, concerning atmospheric dump valves at Indian Point Unit 3, concluded that additional information was required to complete the acceptance review. Following a phone call on July 12, 2012, the NRR staff issued a Letter on July 19, 2012 that identified the following items that need to be addressed in a supplemental letter:

Question 1

The atmospheric dump valves (ADVs) are credited in the steam generator tube rupture (SGTR) analysis. The proposed revision to TS Bases Section 3.7.4 states that no failure of a second ADV is postulated. In addition, the SGTR analysis in both the Indian Point Unit 3 Updated Final Safety Analysis and the NRC's safety evaluation for the 4.85 percent stretch power uprate dated March 24, 2005, did not address single active failures of ADVs. Please provide the licensing basis for not assuming a single active failure for the SGTR analysis.

Response

The SGTR thermal-hydraulic analyses performed for many of the earlier Westinghouse plants, including IP3, did not include a computer analysis to determine the plant transient behavior following a SGTR. Rather, simplified calculations were performed, based on the expected SGTR transient response, to determine the primary-to-secondary break flow and the steam release to the atmosphere for use in calculating the radiological consequences due to the event. The analyses were based on the assumption that the required operator actions to terminate the break flow and the steam release from the ruptured steam generator can be completed within 30 minutes of the initiation of the event. The atmospheric dump valves (ADVs) are not credited in the licensing basis SGTR hydraulic analysis. Rather, it is assumed that the secondary pressure is maintained at the lowest safety valve setpoint following reactor trip. The analyses assume that the operators can terminate break flow within 30 minutes and continue to remove decay heat to maintain the RCS temperature; there are no specific response time requirements made in the analyses for opening and closing the ADVs. The IP3 SGTR licensing basis analysis does not need to consider a single failure based on the vintage of the calculation. The hand calculation methodology is a simplified calculation and does not consider any single failures. The methodology used for the licensing basis IP3 UFSAR analysis was developed to provide an overall conservative calculation of the break flow and steam releases for use in determining the radiological consequences for the event.

The TS Bases requires changing per the May 23, 2012 letter because it does not reflect the licensing basis. The IP3 custom TS (prior to conversion to the STS) did not contain any requirements for the ADVs. When it was added to the STS the intent was to make the revised TS Bases reflect the STS without changing the plant Licensing basis and an oversight occurred by including a discussion of single failure. This was not supported by the analysis and evaluation which did not account for a single failure.

When the operating license was issued, the FSAR, as amended to reflect the License review, is consistent with the no single failure of an atmospheric dump valve. The FSAR says:

1. "The main objective of the operator is to determine that a steam generator tube rupture has occurred, and to identify and isolate the faulty steam generator on a restricted time scale in order to minimize contamination of the secondary system and ensure termination of

radioactive release to the atmosphere from the faulty unit. The recovery procedure can be carried out in a time scale which ensures that break flow into the secondary system is terminated before water level in the affected steam generator rises into the main steam pipe." The conclusion was the isolation procedure could be completed in 30 minutes.

2. The sequence of events for the tube rupture does not identify a single failure of an atmospheric dump valve. It says "The plant trip automatically shuts off steam supply to the turbine...In the event of a co-incident station blackout, the condenser bypass valves would automatically close to protect the condenser. The steam generator pressure would rapidly increase resulting in steam discharge to the atmosphere through the steam generator safety and/or power operated relief valves."

3. The listing of assumptions in the FSAR identifies no single failure of an atmospheric dump valve

4. The discussion of the recovery procedure says "If outside power is not available, atmosphere dump from the unaffected steam generators is used to reduce steam pressure in the unaffected steam generators, thereby cooling and reducing pressure in the reactor coolant system."

10 CFR 50 Appendix A defines single failure but the General Design Criteria which formed the bases for the Indian Point 3 design were published by the Atomic Energy Commission in the Federal Register of July 11, 1967 and subsequently made part of 10 CFR 50. FSAR Section 1.3 was added to reflect the response to NRC Confirmatory Order of February 11, 1980. No single failure of an ADV was discussed.

Question 2

The proposed revision to TS Bases 3.7.4 describes how 4 ADVs must be OPERABLE to ensure that at least 3 ADVs are available to conduct a plant cooldown following a SGTR. Please confirm the number of ADVs required for plant cooldown in the analysis of record, and discuss whether it is possible to cool the plant down safely following a SGTR with fewer ADVs.

Response

As stated above, the licensing basis SGTR does not model ADVs. Following improvements in the Emergency Operating Procedures (EOPs), it was recognized that operators may not be able to terminate break flow within 30 minutes for all postulated SGTR events. Consequently, a supplemental analysis was performed for stretch power uprate (SPU) to support an operator action time of 60 minutes. This analysis does not replace the licensing basis, but demonstrated that even with the longer operator action time, the radiological dose consequences of the hand calculation remain bounding. Further, and while not an explicit part of the IP3 licensing basis, the analysis also demonstrated margin to steam generator overfill. The supplemental analysis assumed conservative operator action times for ruptured SG AFW flow isolation, ruptured SG steamline isolation, initiation of cooldown, initiation of depressurization and termination of ECCS injection. The supplemental analysis also assumed that the RCS is cooled down by dumping steam from the ADVs on the intact SGs. The supplemental analysis conservatively assumed an ADV capacity of 353,000 lbm/hr/valve. The installed capacity of these ADV's is 616,750 lbm/hr/valve. The actual relief capacity of 2 ADV's will be 1,233,500 lbm/hr (2 x 616,750) and exceeds the analysis assumed value of 1,059,000 lbm/hr (3 x 353,000). Thus the supplemental analysis remains valid with 2 ADVs.

Question 3

Revision 2 to Indian Point emergency operating procedure 3-E-3 (page 12 of 56) describes available operator actions to vent the faulted steam generator to the atmosphere. While this version of the emergency operating procedure may be out of date, please clarify the conditions under which plant operators would vent the faulted steam generator to atmosphere and whether such actions would be bounded by the dose analysis of record.

Response

The Emergency Operating Procedures (EOPs) are based on the Emergency Response Guideline (ERG) program developed by the Pressurized Water Reactor Owners Group (PWROG) to provide the control room operators with symptom-based technical guidance for response to accidents and transients. Consequently, response to scenarios considered beyond Design Basis Event, as discussed below, are also addressed.

For the SGTR event, Optimal Recovery Guidelines direct the operator to the E-3 guideline whenever symptoms of a tube failure exist, such as high secondary side activity or an uncontrollably increasing steam generator water level. The E-3 series and ECA-3 series guidelines are general enough to address a wide variety of multiple failures, such as tube failures in combination with other loss of coolant accidents (LOCAs) or secondary side breaks, yet, they are also sufficiently specific to ensure prompt operator response.

The latest version of the Steam Generator Tube Rupture EOP is 3-E-3 Revision 3, and the step referred to in the above RAI is Step 6.b, DUMP steam to condenser from intact SG(s) at maximum rate, NOT to exceed 0.4 E6 lbm/hr per intact SG. In particular, #4 under the RESPONSE NOT OBTAINED column states:

4) IF NO intact SG is available, THEN PERFORM the following:
- USE faulted SG.

  OR

- GO to 3-ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.

This step is to address that in the unlikely event no intact steam generator is available, one must select either a faulted steam generator, i.e., one with a secondary side break, or a ruptured steam generator for cooling the RCS to RHR System operating conditions. Thus, this step addresses a SGTR with a main steamline break or LOCA and is beyond design basis.