



Entergy Nuclear Northeast  
Indian Point Energy Center  
450 Broadway, GSB  
P.O. Box 249  
Buchanan, N.Y. 10511-0249  
Tel (914) 734-6700

J.E. Pollock  
Site Vice President  
Administration

March 25, 2009

Indian Point Unit 2  
Docket No. 50-247  
NL-09-004

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Mail Stop O-P1-17  
Washington, D.C. 20555-0001

Subject: **License Amendment Request Regarding Surveillance Requirements  
For ECCS Valves Required to be in Position with Power to the Valve  
Operator Removed**

References:

- 1) NRC Generic Letter 2004-02: "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors."
- 2) Entergy Letter NL-08-025 to the NRC, "Supplemental Response to NRC Generic Letter 2004-02, Potential Impact Of Debris Blockage On Emergency Recirculation During Design Basis Accidents At Pressurized-Water Reactors," dated February 28, 2008.
- 3) NRC letter dated December 4, 2008, "Indian Point Nuclear Generating Unit Nos. 2 and 3 – Issuance of Amendments Re: Passive Failure Analysis (TAC Nos. MD8290 and MD8291)."

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Entergy Nuclear Operations, Inc. (Entergy) hereby requests an amendment to the Operating License and the Technical Specifications (TS) for Indian Point Unit 2. The proposed changes support Entergy's resolution of Generic Letter (GL) 2004-02 (Reference 1) by establishing a licensing basis that supports meeting the regulatory requirements of the GL.

A116  
NRR

The proposed amendment would add two Emergency Core Cooling System (ECCS) valves to Surveillance Requirement (SR) 3.5.2.1. The purpose of the SR is to verify that ECCS valves whose single failure could cause loss of the ECCS function are in the required position with power removed so that the single failure could not occur. With normal ac power removed valve position indication would be lost. Entergy plans to provide the required position indication by installing an alternate source of power to the indicators during the spring 2010 refueling outage (2R19).

The demonstration that the recirculation and containment sump strainer designs are capable of accommodating the GL 2004-02 licensing basis debris loads, including chemical effects, is being addressed (Reference 2) and will be further addressed by additional submittals as required by the granted extension requests, resolution of audit open items, and requests for additional information. As such, this amendment regarding active failures is similar to a recently approved (Reference 3) license amendment that addressed passive failures.

Attachment I provides a description of the proposed changes and an evaluation in accordance with 10 CFR 50.91(a)(1) using the criteria of 10 CFR 50.92(c) to demonstrate that the proposed changes involve no significant hazards considerations. Attachment II provides the existing TS pages marked-up to show the proposed changes.

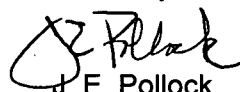
Entergy requests approval of the proposed license amendment by February 26, 2010, with implementation prior to entering Mode 4 during startup from 2R19.

In accordance with 10 CFR 50.91, a copy of this application and the associated attachments are being submitted to the designated New York State official.

There are no new commitments identified in this submittal. If you have any questions or require additional information, please contact Mr. R. W. Walpole at (914) 734-6710.

I declare under penalty of perjury that the foregoing is true and correct. Executed on March 25, 2009.

Sincerely,



J. E. Pollock  
Site Vice President  
Indian Point Energy Center

**Attachments:**

- I. Analysis of Proposed License Amendment and Technical Specification Change Request Regarding Surveillance for ECCS Valves Required to be in Position with Power to the Valve Operator Removed.
- II. Proposed Technical Specification Changes – Markup Pages.

cc: Mr. John P. Boska, Senior Project Manager, NRC NRR DOLR  
Mr. Samuel J. Collins, Regional Administrator, NRC Region 1  
NRC Resident Inspector, IP2  
Mr. Robert Callender, Vice President, NYSERDA  
Mr. Paul Eddy, New York State Department of Public Service

**ATTACHMENT I TO NL-09-004**

**ANALYSIS OF PROPOSED LICENSE AMENDMENT AND TECHNICAL  
SPECIFICATION CHANGE REQUEST REGARDING  
SURVEILLANCE FOR ECCS VALVES REQUIRED TO BE IN  
POSITION WITH POWER TO THE VALVE OPERATOR REMOVED**

**ENTERGY NUCLEAR OPERATIONS, INC.  
INDIAN POINT 2 NUCLEAR POWER PLANT  
DOCKET NO. 50-247**

## **1.0     DESCRIPTION**

Pursuant to 10 CFR 50.90, Entergy Nuclear Operations, Inc. (Entergy) hereby requests an amendment to the Operating License and the Technical Specifications (TS) for Indian Point Unit 2. The proposed changes support Entergy's resolution of Generic Letter (GL) 2004-02 (Reference 1) by establishing a licensing basis that supports meeting the regulatory requirements of the GL. The proposed amendment would add two Emergency Core Cooling System (ECCS) valves to Surveillance Requirement (SR) 3.5.2.1. The purpose of the SR is to verify that ECCS valves whose single failure could cause loss of the ECCS function are in the required position with power removed so that the single failure could not occur. With normal ac power removed, valve position indication would be lost. Entergy plans to provide the required position indication by installing an alternate source of power to the indicators during the spring 2010 refueling outage (2R19).

The demonstration that the recirculation and containment sump strainer designs are capable of accommodating the GL 2004-02 licensing basis debris loads, including chemical effects, is being addressed (Reference 2) and will be further addressed by additional submittals as required by the granted extension requests, resolution of audit open items, and requests for additional information. As such, this amendment regarding active failures is similar to a recently approved (Reference 3) license amendment that addressed passive failures.

The containment sump is a backup to the internal recirculation sump for the provision of long term core cooling. Under the current licensing basis, in order to provide the required backup function, the Emergency Core Cooling System (ECCS) is arranged to allow either of the residual heat removal pumps, drawing water from the containment sump, to take over the recirculation function at the earliest time that recirculation is initiated. Entergy has performed a single failure analysis and has determined that, except for a passive failure (Reference 3), the only single failure that could require the backup capability of the containment sump is the spurious closure of motor operated valves (MOVs) 745A or 745B (745A/B), which would effect the high head recirculation mode of operation.

Entergy's strategy for meeting the regulatory requirements of GL 2004-02 involves not crediting the containment sump for a period of 24 hours following a DBA. In order to preclude the spurious closure of MOVs 745A/B, and the consequential loss of a safety function, it is proposed that these valves be de-energized in the open position. The valves would be re-energized 24 hours following a DBA.

The proposed amendment would add two Emergency Core Cooling System (ECCS) valves (MOVs 745A/B) to Surveillance Requirement (SR) 3.5.2.1. The purpose of the SR is to verify that ECCS valves whose single failure could cause loss of the ECCS function are in the required position with power removed so that the single failure could not occur. For informational purposes a similar license amendment was recently approved for Indian Point Unit 2 (Reference 4).

## **2.0     PROPOSED CHANGES**

Add the following to IP2 Technical Specification 3.5.2, Surveillance Requirement 3.5.2.1 under the headings:

Number	Position	Function
745A	Open	22 RHR Hx Inlet
745B	Open	22 RHR Hx Inlet

## **3.0     TECHNICAL ANALYSIS**

The purpose of SR 3.5.2.1 is to assure that misalignment or single failure of a valve cannot cause loss of the ECCS safety function. The SR 3.5.2.1 valves are of the type that can disable the function of more than one ECCS train and invalidate the accident analyses. This License Amendment request is intended to add two ECCS valves to SR 3.5.2.1 whose single failure has been analyzed and whose failure could cause loss of the ECCS function when the requirements of GL 2004-02 are fully implemented.

### **3.1 Single Active Failure Analysis**

The ECCS design incorporates redundancy of components such that the core cooling function can be met assuming any active component to fail concurrent with a DBA, or over the long term period, a passive or active component failure. In addition, in accordance with Branch Technical Position EICSB 18, imposed by Reference 5, active failures include the spurious closure of manually operated MOVs such as 745A/B.

In order to preclude the use of the containment sump for a period of 24 hours following a DBA, active and passive failures affecting the function of the ECCS involving the use of the internal recirculation sump must be considered. Passive failures have been addressed by Amendment 257 (Reference 3). Active failures are the subject of the current amendment request and it has been determined that the inadvertent or spurious closure of either MOV-745A or MOV-745B (RHR Heat Exchanger inlet valves) during the post-accident recirculation phase renders high head recirculation from the internal recirculation sump unavailable. This unavailability occurs because the low head to high head transfer line (line #60), is connected only to the outlet of RHR Heat Exchanger 21, and the common discharge of the internal recirculation pumps connects only to the inlet of RHR Heat Exchanger 22 upstream of the (in series) 745 valves. Thus, any 745A/B valve closure would effectively isolate the internal recirculation sump from line #60 and not permit high head recirculation.

For this eventuality, the current licensing basis, design basis, and procedures require a switchover from the recirculation sump to the containment sump. The RHR pumps (taking suction from the containment sump) rather than the internal recirculation pumps would provide the long term core cooling water through RHR Heat Exchanger 21 into line #60. As a result of GL 2004-02 debris

generation, transport, and strainer loading analyses related to containment sump design, a change to the licensing basis was enacted to allow for a delay of 24 hours for a postulated passive failure which would in turn negate the need to switchover to the containment sump for 24 hours after event initiation. As part of Entergy's final response to GL 2004-02 it will be demonstrated that this 24 hour time period allows for sufficient debris removal at the recirculation sump so that the smaller straining area of the containment sump is capable of handling any remaining debris without negatively impacting RHR pump function. This debris removal process is termed "pool turnover" utilizing the internal recirculation sump. For this "pool turnover" methodology to be successful, the ECCS design must preclude spurious closure of a 745A/B valve until at least 24 hours following a DBA. It is proposed that this be achieved by de-energizing the 745A/B valves in the open position during operating Modes 1, 2, 3, and 4, to preclude spurious closure of either of these valves. Alternative valve position indication is required to be provided as removing normal ac power from these valves will result in loss of existing valve position indication.

The 745A/B valves would be re-energized 24 hours following a DBA. An active failure at this time would be acceptable because a transfer to the containment sump from the recirculation sump would be acceptable from a sump performance perspective.

### 3.2 Functional Requirements for MOVs 745A and 745B

The safety function of the 745A/B valves is to:

1. Remain open to ensure the availability of safety injection flow paths to the reactor coolant system cold and hot legs during both the injection and recirculation phases of a design basis accident.
2. Close to isolate a passive failure involving portions of the RHR subsystem and line #60.

Under the proposed amendment the 745A/B valves would continue to perform these functions. The ECCS passive failure licensing basis (Reference 3) does not require the 745A/B valve isolation function until 24 hours following a DBA. Therefore, in order to perform the isolation function, the 745A/B valves would need to be re-energized at that time.

### 3.3 MOV-745A/B de-energization and re-energization

The 745A/B valve motor operators would be de-energized at their Motor Control Centers (MCCs) in the Primary Auxiliary Building. At approximately 24 hours after a DBA, operator action would be required to re-energize the motor operators at the MCCs. This would re-establish the valves' ability to be closed under a passive failure event and fulfill their intended safety function.

The capability of personnel to access the MCC area after 24 hours has been evaluated. At that time in the accident scenario, operator action would be required to re-energize the 745 valves. It has been determined that the radiological doses would be sufficiently low at that time to allow operator access to the MCCs.

### 3.4 MOV-745A/B Technical Specifications and Central Control Room Position (CCR) Indication

The Technical Specifications, specifically Surveillance Requirements for the ECCS (SR 3.5.2), discuss certain valves in the ECCS whose positions need to be verified in the required operating Modes. Technical Specification SR 3.5.2.1 lists ECCS valves that are position surveilled on a 7 day frequency, while Technical Specification SR 3.5.2.2 covers ECCS valves whose positions are surveilled on a 31 day frequency. An ECCS valves' inclusion in, and the surveillance frequency for, SR 3.5.2.1 and SR 3.5.2.2 are specified in the Technical Specification Bases which states in part:

SR 3.5.2.1 – "misalignment of these valves could render more than one ECCS train inoperable"; and

SR 3.5.2.2 – "improper valve position would only affect a single train of ECCS".

Currently, the 745A/B valves are included in SR 3.5.2.2 since a mispositioning of one of the valves would still permit the ECCS function during injection phase and recirculation (using the containment sump). Valve position is currently verified every 31 days by observing the CCR indication.

The proposed amendment would add the 745A/B valves to SR 3.5.2.1. This is necessary because, under the regulatory requirements of GL 2004-02, the mispositioning of one of these valves could render more than one ECCS train inoperable.

When the MOV-745A/B valves are de-energized at their respective MCCs, their CCR normal position indication will be lost. Entergy plans to provide the required position indication by installing an alternate source of power to the indicators during the spring 2010 refueling outage (2R19). This modification will meet the indication requirements of EICSB 18 Revision 0, by providing continuous redundant valve position indication.

### 3.5 Summary

It is concluded that MOV-745A and B can be de-energized and re-energized as required at their respective MCCs, and that continuous and redundant valve position indication in the CCR is required and will be provided.

Adding the normally open valves on the 22 RHR Hx inlet line to the TS SR 3.5.2.1 will add a TS requirement for the two valves consistent with the intent of the TS. In addition to adding these valves to TS SR 3.5.2.1, a modification is required to provide control room position indication for these valves to support their de-energization.

## **4.0 REGULATORY ANALYSIS**

### **4.1 No Significant Hazards Consideration Determination**

Entergy has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by assessing the change using the three criteria of 10 CFR 50.92 as discussed below:



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

Response – No

The proposed change adds two ECCS valves to SR 3.5.2.1. The purpose of the surveillance is to assure that the valves are in their required position with normal ac power removed from the valve operator so that misalignment or single failure cannot prevent completion of the ECCS function. The performance of the SR does not involve any actions related to the initiation of an accident and therefore the proposed changes cannot increase the probability of an accident. Misalignment or single failure of one of the two valves being added to TS could cause a loss of the ECCS function based on GSI-191 evaluations, so the change will not increase the consequences of an accident but rather provide assurance that no such increase can occur. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

Response – No

The proposed change adds two ECCS valves to SR 3.5.2.1. The purpose of the surveillance is to assure that the valves are in their required position with normal ac power removed from the valve operators so that misalignment or single failure cannot prevent completion of the ECCS function. The provision of alternate power to the existing valve position indication during the upcoming spring 2010 outage (2R19), will allow the valve operators to be normally de-energized. The change assures that the valves will be in their correct position and does not introduce any new failure modes or the possibility of a different accident. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response – No

The proposed change adds two ECCS valves to SR 3.5.2.1. The purpose of the surveillance is to assure that the valves are in their required position with normal ac power removed so that misalignment or single failure cannot prevent completion of the ECCS function. The valves will be re-energized 24 hours following a DBA and therefore will be capable of performing their required function of isolating a potential passive failure at that time. This ensures that the ECCS function can be performed without a reduction in the margin of safety.

#### **4.2 Applicable Regulatory Requirements / Criteria**

The proposed changes have been evaluated to determine compliance with applicable regulatory requirements.

10 CFR 50.46 provides acceptance criteria for the ECCS following a LOCA. The proposed changes provide a new SR that helps ensure that the ECCS can function as designed following a LOCA. The ECCS will meet the criteria of 10 CFR 50.46 when functioning as designed.

GDC 35 requires an ECCS that will provide "abundant emergency core cooling". The revised SR is consistent with the design of the ECCS system evaluated for power uprate and the single failures analyzed for the system. The addition of valves to SR 3.5.2.1 assures that no single failure or misalignment can affect the ECCS function.

#### **4.3 Environmental Considerations**

The proposed changes in this license amendment, including the related changes to the plant technical specifications do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

#### **4.4 Precedence**

The proposed TS change is to make the TS reflect the single failure assessments of the ECCS system consistent with the Standard Technical Specification (STS) and is consistent with a recent Technical Specification change approved for Indian Point Unit 2 (Reference 4).

### **5.0 REFERENCES**

- 1) NRC Generic Letter 2004-02: "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors."
- 2) Entergy Letter NL-08-025 to the NRC, "Supplemental Response to NRC Generic Letter 2004-02, Potential Impact Of Debris Blockage On Emergency Recirculation During Design Basis Accidents At Pressurized-Water Reactors," dated February 28, 2008.

- 3) NRC letter dated December 4, 2008, "Indian Point Nuclear Generating Unit Nos. 2 and 3 – Issuance of Amendments Re: Passive Failure Analysis (TAC Nos. MD8290 and MD8291)."
- 4) NRC letter dated October 30, 2008, "Indian Point Nuclear Generating Unit No. 2 – Issuance of Amendment Re: Revision to ECCS Valve Surveillance Requirements (TAC No. MD7501)."
- 5) NRC letter from Mr. George Lear to Consolidated Edison dated June 18, 1975.

**ATTACHMENT II TO NL-09-004**

**PROPOSED TECHNICAL SPECIFICATION  
CHANGES – MARKUP PAGES**

Additions – **Bold** and *Italics*

**ENTERGY NUCLEAR OPERATIONS, INC.  
INDIAN POINT 2 NUCLEAR POWER PLANT  
DOCKET NO. 50-247**

SURVEILLANCE REQUIREMENTS

SURVEILLANCE			FREQUENCY
SR 3.5.2.1	Verify the following valves are in the listed position with power to the valve operator removed.		7 days
	<u>Number</u>	<u>Position</u>	
	842	Open	
	843	Open	
	883	Closed	
	743	Open	
	1870	Open	
	856B	Closed	
	856F	Closed	
	1810	Open	
	882	Open	
	744	Open	
	<b>745A</b>	<b>Open</b>	
	<b>745B</b>	<b>Open</b>	
SR 3.5.2.2	Verify each ECCS manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.		31 days
SR 3.5.2.3	Verify each ECCS pump's developed head at the test flow point is greater than or equal to the required developed head.		In accordance with the Inservice Testing Program
SR 3.5.2.4	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.		24 months