

In the Matter of Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Station, Unit 2)
Docket No. 50-247-LA
ASLBP No. 15-942-06-LA-BD01

**ATTACHMENT 1 TO ENTERGY'S JUNE 12, 2015 ANSWER OPPOSING STATE OF
NEW YORK'S PETITION TO INTERVENE AND REQUEST FOR HEARING**

Excerpt from Letter from Lawrence Coyle, Entergy, to NRC Document Control Desk, NL-15-068,
Response to Request for Additional Information Regarding License Amendment to Permanently
Extend the Frequency of the Containment Integrated Leak Rate Test (TAC No. MF3369), Indian
Point Unit Number 2, Docket No. 50-247, License No. DPR-26 (June 8, 2015)



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Lawrence Coyle
Site Vice President

NL-15-068

June 8, 2015

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

SUBJECT: Response to Request for Additional Information Regarding License
Amendment to Permanently Extend the Frequency of the Containment
Integrated Leak Rate Test (TAC NO. MF3369)
Indian Point Unit Number 2
Docket No. 50-247
License No. DPR-26

REFERENCES: 1. NRC Letter to Entergy, Request for Additional Information Regarding the
Proposed License Amendment to Permanently Extend the Containment
Type A Leak Rate Test Frequency to 15 years (TAC NO. MF5382),
dated April 28, 2015

2. Entergy Letter NL-14-128 to NRC Regarding Proposed License
Amendment Regarding Extending the Containment Type A Leak Rate
Testing Frequency to 15 years, dated December 9, 2014
(ML14353A015)

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 Technical Specifications (TS) in Reference 2. The responses to the request for additional information are provided in Attachment 1.

No new Regulatory Commitment is made in this submittal.

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

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 June 8, 2015.

Sincerely,



LC/sp

Attachment: Response to Request for Additional Information Regarding the Extension of the Containment Type A Leak Rate Testing Frequency to 15 years

Enclosure: Documents Provided in Support of The Response to Request for Additional Information Regarding the Extension of the Containment Type A Leak Rate Testing Frequency to 15 years

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

ATTACHMENT TO NL-15-068

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REGARDING THE EXTENSION OF THE CONTAINMENT
TYPE A LEAK RATE TESTING FREQUENCY TO 15 YEARS

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2
DOCKET NO. 50-247

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING THE EXTENSION
OF THE CONTAINMENT TYPE A LEAK RATE TESTING FREQUENCY TO 15 Years**

In order for the NRC staff to complete their review of the Entergy request for Technical Specification Amendment to extend the Containment Type A leak test, the NRC Containment and Ventilation Branch (SCVB) has requested additional information. These requests and Entergy's responses follow:

SCVB RAI-1

License Amendment Request (LAR) Section 4.3.1 "Integrated Leak Rate Test (ILRT) Test Results" (pages 5&6 of 19, Attachment 1, Reference 1) details all test pressures in the absolute pressure scale of "psia" [pounds per square inch absolute]. Without providing the corresponding atmospheric pressure for each test pressure, the U.S. Nuclear Regulatory Commission (NRC) staff cannot confirm that the "calculated peak containment internal pressure for the Design-Basis-Loss-Of-Coolant accident, P_a , ..." of 47 psig [pounds per square inch gauge] was satisfied during ILRT test performance (Reference Indian Point Nuclear Generating Unit No. 2 (IP2) Technical Specification (TS) 5.5.14.b), consistent with the direction of Nuclear Energy Institute (NEI), Revision 2-A (Reference 2) and the test methodology of American National Standards Institute/American Nuclear Society (ANSI/ANS) 56.8-2002 (Reference 3).

For example an excerpt from Section 4.3.1 reads:

"The last two tests were:

1. The last ILRT in April 2006 had a measured containment leak rate (L_{tm}) at the test pressure of 60.5 psia was 0.0636 % containment air weight / day with a 95% confidence level."

Since P_a equals 47 psig, a test pressure of 60.5 psia prompts concern that the test pressure was not greater than P_a .

The staff requests that the licensee provide the corresponding recorded atmospheric pressures from each of the five ILRT test results recorded in Section 4.3.1

Response

The minimum allowable containment pressure during a Type A test is established in paragraph 3.2.12 of ANSI/ANS-56.8-2002 "Containment System Leakage Testing Requirements," which states that "The Type A test pressure shall not be less than 0.96 Pa for the duration of the Type A test". For the IP2 containment the P_a is 47 psig resulting in a minimum allowed containment pressure during the Type A test of 45.12 psig.

The IP2 Integrated Leak Rate Test procedure 2-PT-10Y001 used for the 2006 ILRT states that the lowest pressure reading during the ILRT was 60.5 psig when the outside atmospheric pressure was 14.848 psig yielding a minimum test pressure of 45.652 psig. Since the minimum test pressure of 45.652 psig was greater than the minimum required pressure of 45.12 psig, the requirements of ANSI/ANS-56.8-2002 were satisfied.

The five tests identified in NL-14-128, Section 4.3.1 are the ILRTs performed in August 1979, September 1984, December 1987, June 1991 and April 2006. The lowest recorded test pressures and the highest atmospheric pressures are recorded below. No recorded atmospheric pressures are available from the August 1979 test.

Year	Lowest Containment Pressure (psia)	Highest Atmospheric Pressure (psia)	Pressure Differential
1979	No data		
1984	65.285	14.904	50.381
1987	62.913	14.7*	48.213
1991	61.562	14.7*	46.862

*The atmospheric pressure was not measured but assumed to be 14.7 psia.

SCVB RAI-2

The last sentence of page 6 of 19, Attachment 1 (Reference 1) from LAR Section 4.3.2 "Type B and C testing" reads "Notes are provided for test failures." However, no notes in Table 4.3-2 or subsequent pages of the LAR were provided that detail: (a) which Type B and Type C local leak rate tests (LLRTs) failed; (b) what corrective actions were performed; and (c) what historical test failures have been repetitive from the total population of Type B penetrations and Type C isolation valves.

The staff requests that the licensee provide this missing information.

Response

The LLRT failures, corrective actions and historical test failures as repetitive from the total population of Type B penetrations and Type C isolation valves follow:

During the 2R21 refueling outage in 2014 the leak rate through PRT Nitrogen Supply Line Check Valve 518 (3/4") was 1387.5 cc/min which exceeded the acceptance criterion of 300 cc/min. The acceptance criterion is an administrative limit and a higher value can be accepted without repair on an individual case basis when the overall containment leakage remains within the 10CFR50, Appendix J limit. This failure was documented in the IPEC Corrective Action program. Since an evaluation demonstrated that this leak rate did not adversely impact the ability of the containment to perform its design function (i.e. meet the leak rate limits of 10CFR50, Appendix J), this valve was accepted and a repair has been scheduled for the 2016 2R22 refueling outage. This was not a repetitive failure since this valve had not previously exceeded its leak rate limit.

Also during the 2R21 refueling outage, the leak rate through RCDT Nitrogen Supply Line CIV 1616 (1") was 21,000 cc/min, which exceeded the acceptance criteria of 400 cc/min. This failure to meet the acceptance criteria was accepted because the overall leakage remained within the 10CFR50, Appendix J limit even though a repair was ineffective. This was documented in the IPEC Corrective Action program. An evaluation of this valve indicated that this was a repetitive failure. During 2R20, the prior outage in 2012, valve 1616 failed the leak rate test with a leakage rate of 6,000 cc/min. This failure to meet the acceptance criterion was accepted since the overall containment leakage was below the allowable limit and a repair was scheduled for 2R21 in 2014.

The repair in 2R21 changed the valve design from a hard seat to a soft seat valve, however, the post work test indicated that the leak rate remained elevated. An investigation indicated that the likely cause of the excessive leakage during the 2R21 post work test was damage to the valve internals caused by the welding process during the repair. Since the higher leak rate did not adversely impact the ability of the containment to perform its design function (i.e. meet the leak rate limits of 10CFR50, Appendix J), valve 1616 was accepted and corrective actions have been implemented to ensure that the repair currently scheduled for the 2016 refueling outage 2R22 will not result in similar damage.

SCVB RAI-3

The staff notes that the use of NEI TR 94-01, Rev 2-A (Reference 2) is acceptable for referencing by licensees proposing to amend their Technical Specifications (TSs) to permanently extend the ILRT surveillance interval to 15 years, provided six specific conditions are satisfied.

Condition 1 from Section 4.1 of NEI TR 94-01, Revision 2-A reads:

For calculating the Type A leakage rate, the licensee should use the definition in the NEI TR 94-01, Rev 2-A, in lieu of that in ANSI/ANS-56.8-2002. (Refer to SE Section 3.1.1.1).

Section 5.0 of the SE for NEI 94-01, Revision 2-A reads:

The performance leakage rate is calculated as the sum of the Type A upper confidence limit (UCL) and as-left minimum pathway leakage rate (MNPLR) leakage rate for all Type B and Type C pathways that were in service, isolated, or not lined up in their test position (i.e., drained and vented to containment atmosphere) prior to performing the Type A test. In addition, leakage pathways that were isolated during performance of the test because of excessive leakage must be factored into the performance determination. The performance criterion for Type A tests is a performance leak rate of less than $1.0L_a$.

Section 3.2.9 "Type A test performance criterion" of ANSI/ANS-56.8-2002 (Reference 3) defines the "performance leakage rate" and reads in part:

"The performance criterion for a Type A test is met if the performance leakage rate is less than L_a . The performance leakage rate is equal to the sum of the measured Type A test UCL and the total as-left MNPLR of all Type B or Type C pathways isolated during performance of the Type A test.

Attachment 1, Page 4 of 19 of Entergy's LAR (Reference 1) for IP2 Compliance with Condition 1 reads:

Implementation of NEI 94-01 Rev 2-A will require use of the definition of "performance leakage rate" defined in Section 5.0 for calculating the Type A leakage rate when performing Type A tests.

The NRC staff notes that the "As found Leakage" is on a continuous trend towards eclipsing the

IP2 TS 5.5.14.d.1 leakage rate acceptance criteria of less than or equal to (\leq) 0.75La (i.e. 0.075 percent containment weight per day) as reflected in SCVB RAI-4 (below). The staff needs to develop a better understanding of why this phenomenon is occurring to make its regulatory decision. The staff notes that IP2's statement of compliance indicates future tense (i.e. "will require"). To make its regulatory decision, the staff needs to understand whether IP2's Type A ILRT plant test procedures currently reflect NEI 94-01, Revision 2-A's definition of "performance leakage rate". If the IRLT test procedures currently reflect the requisite definition, the staff requests historical information as to when the requisite NEI 94-01, Revision 2-A definition was adopted into IRLT test procedures. In addition the staff requests that Entergy Nuclear Operations, Inc. (Entergy) provide a copy of the current IP2 IRLT test procedures, plant drawings, etc. (or procedural excerpts from these documents) to aid the staff in understanding why this phenomenon is occurring.

Response

The IP2 ILRT is performed under procedure 2-PT-10Y001, "Integrated Leak rate Test". The current revision of this procedure is revision 2, dated 8/22/06. Since an ILRT has not been performed since 2006, this procedure has not been updated since 2006.

Revision 2-A of NEI Topical Report 94-01 was approved by the NRC based on a Safety Evaluation Report dated June 26, 2008 and then issued for use by NEI in a letter dated November 19, 2008. Since this topical report was issued after the IP2 ILRT procedure was last revised, the current version of 2-PT-10Y001 does not include the requirements of NEI 94-01, Revision 2-A. Therefore, Entergy will revise 2-PT-10Y001 prior to the next ILRT and will include the NEI 94-01, Revision 2-A requirements as provided in the NRC safety evaluation dated June 25, 2008. A copy of the current version of 2-PT-10Y001 is attached to this RAI response for information.

The definition of performance leakage rate in NEI Topical Report 94-01, Revision 2A, is more detailed than that of ANSI/ANS-56.8-2002 as shown by the quoted portions of those documents in the above question. Performance leakage as defined in 2-PT-10Y001 is "Sum of above report Lam & UCL "AS LEFT" and as-left minimum pathway leakage rate of any pathway isolated during ILRT due to excessive Leakage." The "UCL" is the upper confidence leakage rate and "Lam" is the measured leakage rate. Therefore, there are few practical effects that result from revising the definition of performance leakage rate since the definitions are substantially similar.

The response to RAI-4 below discusses the projected ILRT leakage rate at the end of the 15 year interval based on the previous ILRT results.

SCVB RAI-4

LAR Section 4.3.1 "ILRT Test Results" (pages 5 & 6 of 19, Attachment 1, Reference 1) summarizes the IP2 Type A ILRT test results since August, 1979. These test results are summarized in the following Table:

Date	As found Leakage (% Containment weight per day)	Test Pressure (psia)
April, 2006	0.0636	60.5

June, 1991	0.0478	61.7
December, 1987	0.0342	62.9
September, 1984	0.0320	65.6
August, 1979	0.0260	62.7

The staff notes that the historical trend indicates that consistently, for all five historical ILRTs, the “As found Leakage” is on a continuous trend towards eclipsing the IP2 TS 5.5.14.d.1 leakage rate acceptance criteria of $\leq 0.75L_a$ (i.e. 0.075% Containment weight per day).

Given the above ILRT results trend, the NRC staff requests that:

- (1) The licensee explain why this phenomenon is occurring at IP2. More importantly, what is IP2’s long term corrective action plan to arrest or reverse this trend?

Response

Entergy does not believe that the IP2 Type A ILRT test results since August 1979 indicate that the IP2 containment is degrading or constitutes an adverse trend requiring corrective action. Past ILRT tests performed across the industry have shown that the “as found leakages” measured during ILRTs can vary from performance to performance (as demonstrated, for example, by the Indian Point 3 historical test results). An ILRT is performed to test the containment boundary as well as leakage from Type B penetrations and Type C penetrations. The “as found” ILRT is the leakage from the Containment and the Type B and C penetrations tested as part of the ILRT as well as the leakage through the Type B and C penetrations not tested as part of the ILRT. The Type B and C tests results can vary from ILRT to ILRT depending on the systems that are vented, drained, and open to atmosphere for the ILRT. The leakage from the Type B and C components cannot be used for trending of results since the ILRT does not pinpoint the source of leakage. In addition, visual inspections of the internal and the external containment surfaces will continue to be performed as required by the ASME Section XI Code. These visual inspections are capable of identifying potential degradation if any were to occur prior to the next ILRT.

All of the IP2 ILRT “as found” test results have met the 10 CFR 50 Appendix J criterion of 1.0La. This demonstrates that the overall containment leakage (Type A, Type B and Type C) has been maintained at leakage rates less than the assumed leakage rate in the plant accident analysis. The “as left” criterion for the containment leakage (Type A, Type B and Type C) is 0.75La, a lower value that assures that there is margin for potential degradation that could increase the containment leakage rate before the next ILRT is performed. Such degradation historically has occurred primarily in Type B and C penetrations, which is why these penetrations are tested at a greater frequency than the ILRT.

Even if the past ILRT results are extrapolated through 2021, the resulting value still would not exceed the “as found” acceptance criteria of 1.0La. Furthermore, the IP2 Containment Leakage Rate Testing Program would also require the “as left” criterion to be met prior to plant restart. Note that the approved program also provides for the case where an unacceptable (i.e., “as found” leakage $>1.0L_a$) ILRT were to be performed. NEI 94-01,

Revision 2-A states: "If the Type A performance leakage rate is not acceptable, the performance criterion is not met, and a determination should be performed to identify the cause of unacceptable performance and determine appropriate corrective actions. Once completed, acceptable performance should be reestablished by demonstrating an acceptable performance leakage rate during a subsequent Type A test before resuming operation and by performing another successful Type A test within 48 months following the unsuccessful Type A test."

As noted above, Entergy does not believe that the IP2 containment is degrading or that the IP2 Type A ILRT test results since August 1979 constitute an adverse trend requiring corrective action. Therefore, Entergy is not planning to implement any further corrective actions because the Type A, B and C leakage rates continue to meet the 10CFR50, Appendix J limits. If the limits are not met, the program requires corrective actions and more frequent Type A, Type B or Type C testing.

- (2) Entergy should include in its response a discussion of any IP2 containment modifications (major or minor) that may have affected containment integrity since August, 1979.

Response

There have been no modifications to the IP2 containment since 1979 that are considered major (i.e., of the type that would require separate testing per Appendix J, Section IV). Some minor modifications have been made to the containment structure since 1979, such as isolating portions of the weld channel system, replacement of liner insulation panels to support liner inspections, and repairing delamination on the outside wall of the containment inside the electrical penetration tunnel. None of these minor modifications or maintenance activities would adversely affect the leak integrity of containment.

- (3) For each ILRT, the licensee provide the individual cumulative MNPLR leakage rate for all Type B and Type C pathway test values that constitute a part of the total performance leakage rate (i.e. "As found Leakage") values identified in the table above.

Response

The following is the MNPLR leakage rate information available for each of the ILRT tests (additional details on As Found leakage are attached):

a) 2006 ILRT

WCPS* Zone 1	– 18,689.02 cc/min
WCPS Zone 2	– 19,255.36 cc/min
Containment Spray Header	– 69 cc/min
Containment Spray Header	– 139 cc/min
Purge Supply	– 2,574.23 cc/min
Purge Exhaust	– 5,502.82 cc/min
Pressure Relief	– 364.5 cc/min

Total MNPLR added = 46,593.93 cc/min

* WCPS – Weld Channel Pressurization System

b) 1991 ILRT

Total MNPLR added = 0 cc/min

c) 1987 ILRT

Penetration U-U and V-V – 42.28 cc/min
Other penetrations Isolated during ILRT – 851.81 cc/min

Total MNPLR added = 894.09 cc/min

d) 1984 ILRT

80' Airlock – 16,194.66 cc/min
22 Fan Cooler Unit – 60.76 cc/min
Air Ejector Discharge – 25.86 cc/min
Penetration U-U – 59.32 cc/min
Penetration V-V – 49.88 cc/min

Total MNPLR added = 16,390.48 cc/min

- (4) Additional information about how IP2 plant programs satisfy the guidance of Regulatory Position 3 “Element 3: Define Implementation and Monitoring Program” of RG 1.174, Revision 2 (Reference 4)

Response: Position 3, Element 3 of RG 1.174 states, in part that “The licensee should propose monitoring program(s) that include a means to adequately track the performance of equipment that, when degraded, can affect the conclusions of the licensee’s engineering evaluation and integrated decision making that support the change to the LB. The program should be capable of trending equipment performance after a change has been implemented to demonstrate that performance is consistent with the assumptions in the traditional engineering and probabilistic analyses conducted to justify the change”.

The overall containment leakage includes leakage through containment penetrations and through containment isolation valves (CIVs) (i.e. Type B and C testing). The Type B and C leak rate testing is a quality program implemented per the requirements of IP2 Technical Specification section 5.5.14. This program ensures that Type B and C leak rates are measured on a periodic basis and the results are trended to ensure that degradation is identified and corrected prior to exceeding the corresponding regulatory limits. This program ensures that the requirements of position 3, element 3 of RG 1.174 are satisfied for the containment leak rate test.

REFERENCES:

1. Letter NL-14-128, dated December 9, 2014, from Lawrence Coyle, Entergy Nuclear

Operations to U.S. Nuclear Regulatory Commission regarding the Proposed License Amendment Regarding Extending the Containment Type A Leak Rate Testing Frequency to 15 Years, (ADAMS Accession No. ML14353A015)

2. NEI 94-01, Revision 2-A, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," October 2008 (ADAMS Accession No. ML100620847)
3. ANSI/ANS-56.8-2002, Reaffirmed August 9, 2011, "Containment System Leakage Testing Requirements"
4. Regulatory Guide (RG) 1.174, Revision 2, dated May, 2011, "An Approach For Using Probabilistic Risk Assessment on Plant-Specific Changes To The Licensing Basis" (ADAMS Accession No. ML 100910006).