


United States Nuclear Regulatory Commission Official Hearing Exhibit	
In the Matter of: Entergy Nuclear Operations, Inc. (Indian Point Nuclear Generating Units 2 and 3)	
	ASLBP #: 07-858-03-LR-BD01
	Docket #: 05000247 05000286
	Exhibit #: NYS000572-PUB-00-BD01
	Admitted: 11/5/2015
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**NYS000572 (Public, Redacted)
Submitted: September 9, 2015**

UNITED STATES

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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In re: Docket Nos. 50-247-LR; 50-286-LR

License Renewal Application Submitted by ASLBP No. 07-858-03-LR-BD01

Entergy Nuclear Indian Point 2, LLC, DPR-26, DPR-64

Entergy Nuclear Indian Point 3, LLC, and

Entergy Nuclear Operations, Inc. September 9, 2015

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**PRE-FILED SUPPLEMENTAL REPLY WRITTEN TESTIMONY OF
DR. RICHARD T. LAHEY, JR.
REGARDING CONTENTION NYS-38**

On behalf of the State of New York ("NYS" or "the State"), the Office of the Attorney General hereby submits the following testimony by RICHARD T. LAHEY, JR., PhD. regarding Contention NYS-38/RK-TC-5.

Q. Please state your full name.

A. Richard T. Lahey, Jr.

Q. By whom are you employed and what is your position?

A. I am retired and am currently the Edward E. Hood Professor Emeritus of Engineering at Rensselaer Polytechnic Institute (RPI), which is located in Troy, New York.

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Testimony of Richard T. Lahey, Jr.
Contention NYS-38*

1 Q. Have you previously summarized your educational and
2 professional qualifications?

3 A. Yes, my education and professional qualifications and
4 experience are described in my Curricula Vitae and previously
5 filed testimony in this proceeding.

6 Q. I show you what has been marked as Exhibit ENT000699.
7 Do you recognize that document?

8 A. Yes. It is a copy of the pre-filed testimony of the
9 witnesses for Entergy on Contention NYS-38/RK-TC-5 that were
10 submitted in August 2015.

11 Q. I show you what has been marked as Exhibit NRCR000161,
12 NRC000197 and NRC000168. Do you recognize those documents?

13 A. Yes. They are copies of the pre-filed testimony of
14 the USNRC Staff witness that were submitted in August 2015. They
15 concern Contention NYS-38/RK-TC-5. I note that NRC000168 and
16 NRC000197 primarily discuss Contentions NYS-25 and NYS-26B/RK-
17 TC-1B.

18 Q. Have you had an opportunity to review ENT000699,
19 NRCR000161, NRC000168, and NRC000197?

20 A. Yes.

21 Q. Has Entergy's and the USNRC Staff's August pre-filed
22 testimony caused you to change the testimony and opinions that

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1 you have previously submitted in this proceeding in connection
2 with Contention NYS-38?

3 A. In general, no. Entergy and the USNRC Staff have
4 failed to resolve the age-related safety concerns that I have
5 raised throughout this proceeding. They continue to approach
6 various aging mechanisms in "silos", without addressing the
7 potential synergistic interactions between multiple degradation
8 mechanisms. While Entergy has proposed a reactor vessel
9 internals (RVIs) aging management program based on MRP-227-A,
10 that program is fundamentally flawed due to its failure to
11 consider the potential synergism between irradiation
12 embrittlement and other aging degradation mechanisms and the
13 impact of various significant shock loads on highly-embrittled
14 and fatigue-weakened components. Entergy's RVI Program also
15 lacks sufficient detail on issues relating to inspection
16 techniques and acceptance criteria. Entergy and Westinghouse
17 have presented to the USNRC final, revised cumulative usage
18 factors (CUF_{en}) for various components; however, those values
19 were obtained using a flawed metal fatigue evaluation process in
20 which the level of conservatism, if any, is unclear (i.e., see
21 my most recent testimony on contention NYS-26B (NYS000569)).
22 Entergy has confirmed that, despite its prior commitment to
23 address potential primary water stress corrosion cracking in

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1 steam generator components, it is now considering reliance on
2 industry-funded analysis of the problem rather than the
3 performance of actual inspections. I have discussed these
4 deficiencies in Entergy's analyses in my prior testimony of June
5 9, 2015 (NYS000562) and in my most recent testimony relating to
6 Contentions NYS-25 and NYS-26B/RK-TC-1B (NYS000567, NYS000569),
7 both of which I incorporate by reference and am supplementing
8 today.

9 Q. With respect to steam generators, Entergy states that
10 it has analyzed in detail the impact of thermal and pressure
11 shock loads on a degraded divider plate. (A196) Do you agree?

12 A. No. In support of that claim, Entergy cites to the

[REDACTED]

1 (ENT000683). Thus, its integrity for such loads during the
2 period of extended operations remains unclear.

3 Q. Entergy also states that any reduction in a steam
4 generator's heat removal capability caused by a cracked divider
5 plate would be "negligible" or "insignificant." Entergy
6 Testimony at A197 (ENT000699). Would you agree?

7 A. Again, the problem is that Entergy has not applied the
8 correct shock pressure loading across the crack-weakened steam
9 generator's divider plate using an appropriate shock code. A
10 proper evaluation must consider LOCAs, such as the DBA LOCA for
11 a very large pipe break on the primary side. However, it must
12 also take into account severe LOCAs which can occur on the
13 secondary side (e.g., a steam line break and subsequent SCRAM)
14 that can lead to significant thermal shocks on the primary side.
15 To be clear, I am concerned with all LOCA-type events that can
16 lead to significant pressure and/or thermal shocks on the
17 divider plate. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

22 [REDACTED]

[REDACTED]

[REDACTED]

2
3 Q. Finally, Entergy asserts that cracks will not initiate
4 or propagate from the tubesheet cladding to tube-to-tubesheet
5 welds due to compressive forces in that area. Entergy Testimony
6 at A199 (ENT000699). Do you agree?

A. No, I do not agree. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

20 [REDACTED] It

21 therefore continues to be my opinion that Entergy must perform
22 inspections of the steam generator channel head assembly,
23 including the divider plate and tube-to-tubesheet welds, prior

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1 to entering the period of extended operation (or as soon
2 thereafter, for IP2), as a condition of license renewal.

3 Q. Does this complete your testimony?

4 A. Yes, it does. I do, however, reserve the right to
5 supplement my testimony if new information is disclosed or
6 introduced.

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11 **DECLARATION OF RICHARD T. LAHEY, JR.**

12 I, Richard T. Lahey, Jr., do hereby declare under penalty
13 of perjury that my statements in the foregoing testimony and my
14 statement of professional qualifications are true and correct to
15 the best of my knowledge and belief.

16 Executed in Accord with 10 C.F.R. § 2.304(d)

17 

18 _____
19 Dr. Richard T. Lahey, Jr.

20 The Edward E. Hood Professor Emeritus of Engineering
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22 (518) 495-3884, laheyr@rpi.edu

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