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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	Docket Nos. 50-247-LR and 50-286-LR
ENTERGY NUCLEAR OPERATIONS, INC.	)	
(Indian Point Nuclear Generating Units 2 and 3)	)	August 10, 2015

ENTERGY'S REVISED STATEMENT OF POSITION REGARDING CONTENTION NYS-38/RK-TC-5 (SAFETY COMMITMENTS)

[redacted]

William B. Glew, Esq.
Entergy Nuclear Operations, Inc.
440 Hamilton Avenue
White Plains, NY 10601
Phone: (914) 272-3202
Fax: (914) 272-3205
E-mail: wglew@entergy.com

Kathryn M. Sutton, Esq.
Paul M. Bessette, Esq.
Raphael P. Kuyler, Esq.
MORGAN, LEWIS & BOCKIUS LLP
1111 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
Phone: (202) 739-3000
Fax: (202) 739-3001
E-mail: ksutton@morganlewis.com
E-mail: pbessette@morganlewis.com
E-mail: rkuyler@morganlewis.com

Counsel for Entergy Nuclear Operations, Inc.

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ENTERGY'S STATEMENT OF POSITION REGARDING CONTENTION NYS-38/RK-TC-5 (SAFETY COMMITMENTS)

Pursuant to 10 C.F.R. § 2.1207(a)(1) and the Atomic Safety and Licensing Board's ("Board") Revised Scheduling Order ,[1] Entergy Nuclear Operations, Inc. ("Entergy") submits this Statement of Position ("Position Statement") on Consolidated Contention NYS-38/RK-TC-5 ("NYS-38/RK-TC-5") regarding safety commitments, proffered by the State of New York ("New York" or "the State") and Riverkeeper, Inc. ("Riverkeeper") (jointly "Intervenors"). This Position Statement is supported by the Testimony of Nelson F. Azevedo, Robert J. Dolansky, Alan B. Cox, Jack R. Strosnider, Jr., Timothy J. Griesbach, Barry M. Gordon, Randy G. Lott, and Mark A. Gray Regarding Contention NYS-38/RK-TC-5 ("Entergy's Testimony") (ENT000699), and the exhibits thereto, as filed on August 10, 2015.[2] For the reasons discussed below, NYS-38/RK-TC-5 lacks merit and should be resolved in Entergy's favor.

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1 Licensing Board Revised Scheduling Order at 2 (Dec. 9, 2014) (unpublished) ("Revised Scheduling Order"), *available at* ADAMS Accession No. ML14343A757.

2 *See* Entergy Exhibits ENTR15001, ENT00015A-B, ENTR00031, ENT000032, ENT000041, ENTR00184 through ENTR00186, ENT000190, ENT000192, ENT000196, ENT000197, ENT000230, ENT000251, ENT000252, ENT000522 through ENT000572, ENT000616 through ENT000618, ENT000641, ENT000657, ENT000679, ENT000680, ENT000683, ENT00686A-C through ENT000688, ENT000692, ENT000695, and ENT000699 through ENT000721.

I. PRELIMINARY STATEMENT

NYS-38/RK-TC-5 is a safety contention challenging the license renewal application ("LRA") for Indian Point Energy Center ("IPEC"). The contention asserts that Entergy has failed to describe in sufficient detail certain aging management programs ("AMPs") and aging management activities, and instead is relying on "vague commitments" to satisfy its regulatory obligations.[3] More specifically, the contention and Intervenors' supporting testimony allege deficiencies in six Entergy commitments.[4] Commitments 43 and 49 relate to Entergy's review of its design basis fatigue evaluations to determine whether the previously- analyzed component locations are the limiting locations for the IPEC plant designs. Commitment 44 concerns "user intervention" in future environmentally-assisted fatigue ("EAF") evaluations performed using the WESTEMS™ computer program. Commitments 41 and 42 relate to inspections of steam generator components for primary water stress corrosion cracking ("PWSCC"). Finally, Commitment 30 pertains to Entergy's AMP for IPEC reactor vessel internals ("RVI").

A. Entergy Has Appropriately Relied on Sufficiently Specific and Enforceable License Renewal Commitments, As Expressly Permitted by 10 C.F.R Part 54

At its core, NYS-38/RK-TC-5 seeks to challenge a fundamental and integral component of the Nuclear Regulatory Commission's ("NRC" or "Commission") license renewal process and broader regulatory framework—the use of enforceable licensee commitments in NRC-approved AMPs. Indeed, 10 C.F.R. § 54.29, which sets forth the Commission's standards for the issuance of a renewed license, specifically contemplates agency reliance on applicant commitments.[5] By their own admission, Intervenors seek to eliminate this regulatory option for Entergy and convert

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3 *See*, *e.g.*, Revised Statement of Position on Joint Contention NYS-38/RK-TC-5 at 25, 30 (June 9, 2015) ("Intervenors' Revised SOP") (NYS000531).

4 *See* Entergy's Testimony at A55 (ENT000699) (describing the six commitments at issue in NYS-38/RK-TC-5).

5 *See* 10 C.F.R. § 54.29(a) (2015) (referring to "[a]ctions [that] have been identified and have been *or will be taken*" by the applicant to the effects of aging during the period of extended operation) (emphasis added).

[redacted]

all IPEC license renewal commitments into formal license conditions that can be modified only through the license amendment process set forth in 10 C.F.R. Part 50.[6]

This Board should not sanction such a result, as it would constitute a fundamental modification to 10 C.F.R. § 54.29 and the NRC license renewal process as implemented at IPEC. Moreover, it would essentially eviscerate the flexibility that, by design, is an essential component of the broader NRC regulatory process as well as licensee operational procedures and practices. Such flexibility is needed to facilitate the licensing process, to allow licensees to make program changes and improvements in response to operating experience, and to permit licensees to timely adapt to evolving NRC regulatory guidance and expectations. In fact, after careful review, the NRC Staff specifically rejected the notion that all commitments should be elevated to "legally binding" license conditions, and instead chose to maintain a "hierarchy" of commitment types ranging from "regulatory commitments" to license conditions.[7]

Furthermore, such an outcome is not necessary to ensure that Entergy complies with the NRC's license renewal requirements, including the commitments at issue in NYS-38/RK-TC-5, during the period of extended operation ("PEO"). The Commission has "long declined to assume that licensees will refuse to meet their obligations," given that licensees remain subject to continuing NRC oversight, inspection, and enforcement authority throughout the renewed operating term.[8] Assuming otherwise "would . . . transmogrify license proceedings into open-

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6 Intervenors' Revised SOP at 54 (NYS000531) ("One of the State's objectives in this proceeding is to ensure that any future deviation by Entergy from any of the statements relied upon by the Board can only occur by the filing of a licensing amendment and following all the relevant procedures for such amendment in 10 C.F.R. §§ 50.59 and 50.90, 50.91 and 50.92.").

7 *See* NRR Office Instruction, LIC-105, Revision 5, Managing Regulatory Commitments Made by Licensees to the NRC at 1 (Sept. 16, 2013) ("LIC-105") (ENT000705) ("The staff determined that keeping regulatory commitments as an element of licensing basis information should continue because, when handled properly, the commitments *support the overall licensing process by adding flexibility, improving efficiency, and maintaining the flow of information between the staff and licensees*.") (emphasis added).

8 *Pac. Gas & Elec. Co.* (Diablo Canyon Nuclear Power Plant, Units 1 & 2), CLI-03-2, 57 NRC 19, 29 (2003) (citations omitted).

[redacted]

ended enforcement actions: that is, licensing boards would be required to keep license proceedings open for the entire life of the license so Intervenors would have a continuing, unrestricted opportunity to raise charges of noncompliance."[9] That clearly was never the Commission's intent when it enacted its Part 54 license renewal rules or its Part 2 hearing rules. Intervenors have not presented any valid basis for departing from this established precedent.

B. Contrary to Intervenors' Claims, All Required AMPs for Indian Point Units 2 and 3 ("IP2" and "IP3") Are Fully Developed, Have Been Approved by the NRC Staff As Consistent with the GALL Report, and Already Are in Place at IP2

In their position statement and testimony on NYS-38/RK-TC-5, Intervenors and their three witnesses also allege that Entergy has failed to provide "important details" regarding its AMPs and proposed inspections in the LRA.[10] They make these same claims with respect to all six commitments at issue in the contention.[11] They further accuse Entergy of "deferr[ing] implementation of a number of critical aging management actions."[12] Drawing on these claims, Intervenors conclude that the asserted lack of details prevents "meaningful evaluation" of Entergy's proposed aging management activities, frustrates their ability to meaningfully

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9 *See Hydro Res., Inc.* (P.O. Box 777, Crownpoint, NM 87313), CLI-06-1, 63 NRC 1, 5 (2006) (2006) (citation omitted).

10 *See*, *e.g.*, Intervenors' Revised SOP at 10 (NYS000531) ("In [his] testimony Dr. Lahey sets forth his opinion that Entergy's application to renew the Indian Point operating licenses for an additional 20 years still lacks important details in certain areas and is inadequate in other respects.") (citing Revised Pre-Filed Written Testimony of Dr. Richard T. Lahey, Jr. Regarding Joint Contention NYS-38/RK-TC-5 (NYS000562) ("Revised Lahey Testimony").

11 *See*, *e.g.*, *id.* at 23-24 (noting Dr. Hopenfeld's claim that Entergy lacks a sufficiently detailed AMP for metal fatigue) (citing Prefiled Written Testimony of Dr. Joram Hopenfeld Regarding Contention NYS-38/RK-TC-5 at 11-12 (June 19, 2012) ("Hopenfeld Testimony") (RIV000102)); *id.* at 11 (noting Dr. Lahey's criticisms of the Revised and Amended RVI Plan (citing Revised Lahey Testimony at 60 (NYS000562)); *id.* at 7-8 (stating that the "lack of detail" alleged by Dr. Lahey "extends to the steam generator divider plates, tubesheets, and welds, to the disclosure of the parameters for user intervention in the application of the WESTEMS computer code for fatigue analysis, and to the identification of additional limiting locations in the reactor coolant system and pressure boundary for the fatigue analysis") (citing Prefiled Written Testimony of Dr. Richard T. Lahey, Jr. Regarding Contention NYS-38/RK-TC-5 at 9-12 (June 19, 2012) ("Lahey Testimony") (NYS000374)); *id.* at 21 (citing Dr. Duquette's concerns about "substantial uncertainty" relative to inspections of steam generator channel head components).

12 Intervenors' Revised SOP at 2 (NYS000531).

[redacted]

participate in this proceeding, and precludes the development of a record on which the NRC may base its license renewal decision.[13]

These claims are baseless. There is no paucity of details regarding the nature of and bases for Entergy's proposed aging management activities, as set forth in the LRA's AMPs and related commitments. As fully explained in Entergy's testimony on NYS-38/RK-TC-5 and the other two safety contentions pending before the Board (NYS-25 and NYS-26B/RK-TC-1B), Entergy's LRA, as revised and supplemented, explicitly describes specific, robust AMPs that are consistent with all ten elements of the NRC-approved AMPs in NUREG-1801—the agency's key aging management guidance document.[14]

Additionally, those AMPs have been supplemented by Entergy's commitments to undertake specific activities when implementing the AMPs—commitments that are enforceable by the NRC under its established regulatory processes.[15] As a result, the methods, criteria, and timing associated with Entergy's planned aging management activities all are fully set forth in the LRA, as revised and supplemented by Entergy during the NRC Staff's LRA review process.[16] The NRC Staff has reviewed and approved Entergy's proposed aging management activities, as documented in its November 2009 safety evaluation report ("SER"),[17] and Supplements 1 and 2 thereto, issued

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13 *Id.* at 13, 15.

14 *See* NUREG-1801, General Aging Lessons Learned Report, Rev. 1 (Sept. 30, 2005) ("NUREG-1801, Rev. 1") (NYS00146A-C); NUREG-1801, Generic Aging Lessons Learned Report, Rev. 2 (Dec. 2010) ("NUREG-1801, Rev. 2") (NYS00147A-D).

15 *See AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), CLI-09-7, 69 NRC 235, 284 (2009), *aff'd sub nom. N.J. Envtl. Fed'n v. NRC*, 645 F.3d 220 (3d Cir. 2011); *AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), CLI-06-24, 64 NRC 111 (2006) ("We note in any event that AmerGen has made a commitment—which it acknowledges is binding—to ensure adherence to its aging management programs."); *Entergy Nuclear Vt. Yankee, LLC* (Vt. Yankee Nuclear Power Station), CLI-10-17, 72 NRC 1, 37 (2010) ("An applicant may commit to implement an AMP that is consistent with the GALL Report [*i.e.*, NUREG-1801] and that *will* adequately manage aging.") (emphasis in original).

16 *See* Entergy's Testimony at A63 (ENT000699).

17 NUREG-1930, Safety Evaluation Report Related to the License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3, Docket Nos. 50-247 and 50-286 (Nov. 30, 2009) ("SER") (NYS000326A-F).

[redacted]

in August 2011 and November 2014, respectively.[18] Those safety reviews are the culmination of years of Staff review of the LRA, including numerous detailed requests for additional information ("RAIs"), extended audits and inspections, and other interactions with Entergy.[19]

More importantly, Intervenors overlook the fact that Entergy has, to a large extent, already implemented the specific programs and commitments that they claim to be "deferred."[20] Specifically, Entergy has fully implemented Commitment 30 for IP2 and IP3, and fully implemented Commitments 42, 43, and 49 for IP2.[21] Entergy also has completed the technical reviews for Commitments 43 and 49 for IP3, which will be fully implemented before the IP3 PEO.[22] The NRC inspected and approved Entergy's implementation activities at IP2 in 2013, and will conduct similar inspections later this year at IP3.[23]

Thus, Intervenors cannot credibly claim that Entergy's aging management activities lack definition or substance, or that the NRC lacks an adequate record on which to base its license renewal determinations under 10 C.F.R. § 54.21 ("Contents of application – technical information") or findings under 10 C.F.R. § 54.29 ("Standards for issuance of a renewed license"). Intervenors' assertion that Entergy has "frustrated" their ability to meaningfully participate in this proceeding is also untenable.[24] In fact, it is belied by Intervenors' submittal and

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18 NUREG-1930, Supp. 1, Safety Evaluation Report Related to the License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3, Docket Nos. 50-247 and 50-286 (Aug. 30, 2011) ("SSER 1") (NYS000160); NUREG-1930, Supp. 2, Safety Evaluation Report Related to the License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3, Docket Nos. 50-247 and 50-286 (Nov. 30, 2014) ("SSER 2") (NYS000507).

19 *See*, *e.g.*, SSER 2, Appx. B (NYS000507) (providing chronological listing of IPEC LRA-related correspondence).

20 Intervenors' Revised SOP at 3-4 (NYS000531).

21 *See* Entergy's Testimony at A107 (ENT000699).

22 *See id.*

23 *See id.* at A109 (citing Letter from J. Trapp, NRC, to J. Ventosa, Entergy, "Indian Point Nuclear Generating Unit 2 – NRC License Renewal Team Inspection Report 05000247/2013010" (Sept. 19, 2013); Letter from A. Burritt, NRC, to L. Coyle, Entergy, "Annual Assessment Letter for Indian Point Nuclear Generating Units 2 and 3 (Report 05000247/2014001 and 05000286/2014001)," Encl. at 2 (Mar. 4, 2015)).

24 Intervenors' Revised SOP at 2, 13 (NYS000531).

[redacted]

the Board's admission of multiple iterations of its proposed safety contentions despite opposition from Entergy and the NRC Staff, Entergy's voluminous disclosures (including numerous proprietary documents) on those contentions, and the parties' thousands of pages of evidentiary submissions on the same contentions. Thus, contrary to their claims, Intervenors have been given every opportunity to develop and present their concerns.

As the foregoing discussion suggests, Intervenors' challenges to Entergy's reliance on AMPs that comply fully with the program descriptions in NUREG-1801 and specific AMP-implementing commitments are legally baseless and, to a significant extent, have been rendered moot by Entergy's implementation of those commitments, particularly with respect to IP2. In any case, as summarized below, Entergy's expert testimony on NYS-38/RK-TC-5 fully demonstrates that Intervenors' technical challenges to those AMPs and commitments also lack any merit.

One of Intervenors' overarching claims is that, with respect to the three AMPs identified in NYS-38/RK-TC-5, the "necessary factual record is missing because Entergy is not providing any of the details required to determine whether what Entergy will do in the future constitutes an effective aging management program or is consistent with the GALL guidance."[25] Contrary to that claim, however, Entergy has provided sufficient information to demonstrate that the AMPs in question are consistent with NUREG-1801, Revision 1, and meet the intent of NUREG-1801, Revision 2[26]—NRC guidance documents that are entitled to "special weight" absent "unusual circumstance[s]" not present here.[27] Specifically, the Reactor Vessel Internals ("RVI") AMP, Fatigue Monitoring Program ("FMP"), and Water Chemistry Control – Primary and Secondary Program ("Water Chemistry Program") described in the IPEC LRA fully comply with the

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25 *Id.* at 50.

26 *See* Entergy's Testimony at A63, A208 (ENT000699).

27 *Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 & 3), CLI-15-6, 81 NRC __, slip op. at 19, 21-22 (Mar. 9, 2015).

[redacted]

applicable guidance in NUREG-1801 and with NRC license renewal regulations.[28] There are no "missing" details.[29] Indeed, as documented in its SER and two supplements thereto, the Staff has specifically reviewed those AMPs and found them to be complete and fully consistent with the corresponding NUREG-1801 programs.[30] Additionally, there is no requirement to complete all activities specified in an AMP or related commitment (*e.g.*, inspections) prior to the PEO, as Intervenors and their witnesses suggest.[31] Nonetheless, all AMP implementation activities required to be completed prior to the PEO have been completed for IP2, and will be completed for IP3 by the time it enters the PEO in December 2015.[32]

C. Commitments 43 and 49 Are Sufficiently Specific, Have Been Approved by the NRC, and Have Already Been Implemented for IP2 and IP3

In Commitment 43, Entergy committed to review its design basis fatigue evaluations to determine whether the previously-analyzed NUREG/CR-6260 locations are limiting for the IP2 and IP3 configurations.[33] In Commitment 49, Entergy clarified that the limiting locations review would include RVI components.[34] Intervenors claim that these commitments are vague, because

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28 *See* Entergy's Testimony at A63, A64, A208 (ENT000699).

29 Intervenors' Revised SOP at 48, 50 (NYS000531).

30 *See* SER, Vol. 2 at 3-148, 3-241 (NYS00326C) (concluding that the IPEC Water Chemistry Program elements are acceptable and consistent with the ten program elements in NUREG-1801, Revision 1, Section XI.M2, and that cracking due to PWSCC in steam generator divider plates is managed through the Water Chemistry Program, which is consistent with NUREG-1801); SSER 2 at 3-26 (NYS000507) ("On the basis of its review of the applicant's RVI AMP, the staff concludes that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3)."); *id.* at 3-59 ("The staff concludes that the proposed RVI Inspection Plan implements the elements of the RVI AMP in an acceptable manner."); SER at 3-78 to 3-81 (NYS00326B) (determining that the IPEC FMP includes acceptable program elements that are consistent with recommendations in NUREG-1801, Revision 1, Section X.M1.).

31 *See*, *e.g.*, Intervenors' Revised SOP at 17 (NYS000531) (stating that inspections of steam generator divider plate assemblies and tube-to-tubesheet welds "should be conducted before Indian Point Unit 3 begins its period of extended operation, and inspections should be conducted promptly at Indian Point Unit 2"); Entergy's Testimony at A150 (ENT000699) ("There is no requirement that actual inspections or other aging management activities be completed before the PEO begins, and Dr. Lahey cites none.").

32 *See* Entergy's Testimony at A107 (ENT000699).

33 *See id.* at A110.

34 *See id.* at A111.

[redacted]

they do not explicitly define the locations to be analyzed and the process and timing of the analysis of limiting locations.[35] Their claims are meritless. The commitments are quite clear on their face, and the methodology used to identify limiting locations is well defined. The review, which, as discussed below, is now complete, covered *all* plant components with a current licensing basis ("CLB") cumulative usage factor fatigue analysis.[36] Those reviews were performed consistent with standard American Society of Mechanical Engineers Boiler and Pressure Vessel Code ("ASME Code") methods and, as appropriate, using the guidance in NUREG-1801 and several other NRC-approved guidance documents.[37] In short, Commitments 43 and 49, which support the FMP, are sufficiently specific to satisfy 10 C.F.R. § 54.21(a)(3) and (c)(1)(iii), were found acceptable by the NRC Staff, and are being fully implemented at IP2 and IP3.

D. Commitment 44 Is Sufficiently Specific, Has Been Approved by the NRC Staff, and Is Being Properly Implemented for IP2 and IP3

Commitment 44 requires that Entergy provide a written explanation and justification of any "user intervention" —a concept patently misunderstood by Intervenors' witnesses—in future evaluations using the WESTEMS™ "Design CUF" module.[38] Intervenors allege that this commitment is not adequate to ensure that Entergy has disclosed all user interventions (*i.e.*, editing and re-analysis of peaks and valleys) for previous EAF evaluations, or that it will disclose all user interventions for future EAF evaluations.[39] As the NRC Staff concluded in Supplemental Safety Evaluation Report ("SSER 1"), however, Commitment 44 is sufficiently specific and

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35 *See*, *e.g.*, Hopenfeld Testimony at 10-12 (RIV000102).

36 *See* Entergy's Testimony at A119 (ENT000699).

37 *See id.* at A69. To the extent that Intervenors and their witnesses raise technical objections to Entergy's and Westinghouse's limiting locations review and EAF evaluations, those issues are fully addressed in Entergy's testimony on NYS-26B/RK-TC-1B. *See generally* Revised Testimony of Entergy Witnesses Nelson F. Azevedo, Alan B. Cox, Jack R. Strosnider, Randy G. Lott, Mark A. Gray, and Barry M. Gordon Regarding Contention NYS-26B/RK-TC-1B (Metal Fatigue) (Aug. 10, 2015) (ENT000679).

38 *See* Entergy's Testimony at A70, A121 (ENT000699).

39 *See*, *e.g.*, Intervenors' Revised SOP at 3, 7, 13 (NYS000531).

[redacted]

acceptable because it ensures that the records of any calculations performed with WESTEMS™ "Design CUF" module will contain sufficient information to document and justify any assumptions and engineering judgment used to calculate the cumulative usage factor ("CUF") value, and that the basis for the conclusions in the fatigue calculations are auditable and retrievable.[40] Entergy has implemented this commitment at IP2 by changing its FMP to incorporate this requirement, and will formally implement this requirement at IP3 prior to the PEO.[41] Further, as discussed below, Westinghouse has used peak editing in only one of the EAF analyses that it prepared in support of IPEC license renewal (for the IP2 pressurizer spray nozzle), and that "user intervention" has been properly documented in accordance with Commitment 44.[42]

E. Commitment 41 Is Sufficiently Specific and Has Been Approved by the NRC Staff

In Commitment 41, Entergy committed to inspect the steam generators for both IPEC units to assess the condition of the divider plate assemblies, using an examination technique that will be capable of detecting PWSCC in the assemblies.[43] The IP2 inspections will be completed within the first ten years of the PEO, and the IP3 inspections will be completed within the first refueling outage following the beginning of the PEO for that unit.[44] Intervenors criticize Commitment 41 as being too vague.[45] However, as the Staff found in SSER 1, the commitment is sufficiently specific because it requires Entergy to assess the condition of the divider plate assembly in each steam

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40 *See* SSER 1 at 4-2 (NYS000160).

41 *See* Entergy's Testimony at A143 (ENT000699) (citing Entergy, Commitment Closure Verification Form, LRC # 44 (June 19, 2013)).

42 *See id.* at A70, A123 (citing Westinghouse, Calculation Note CN-PAFM-13-40, Rev. 1, "Indian Point Unit 2 and Unit 3 Pressurizer Spray Nozzle Transfer Function Database Development and Environmental Fatigue Evaluations" (Jan. 15, 2015) (ENT000688) (Proprietary) ("Westinghouse Calculation Note CN-PAFM-13-40, Rev. 1")).

43 *See id.* at A143.

44 *See id.*

45 *See* Intervenors' Revised SOP at 7, 13 (NYS000531).

[redacted]

generator at both IPEC units by inspection during the PEO, in a time period consistent with the detection of potential PWSCC cracks, and using an appropriate examination technique.[46] Thus, the obligations imposed by the commitment are both clear and enforceable by the NRC.

It bears emphasis that Entergy made Commitment 41 in response to NRC Staff RAIs citing foreign operating experience in steam generators, in which cracking due to PWSCC has been identified in steam generator divider plate assemblies fabricated from Alloy 600.[47] As explained below, however, the Electric Power Research Institute's ("EPRI") Steam Generator Management Program ("SGMP") Engineering and Regulatory Technical Advisory Group has since completed its extensive, multi-year evaluation of this issue, concluded that divider plate cracking in steam generator models like those installed at IPEC is not a significant safety issue, and determined that there are no data or known operating experience that justify performing additional inspections beyond those currently being done by utilities under their normal ISI programs.[48] A discussed in Section V.D.4 below, insofar as Intervenors raise objections to EPRI's findings or contest their applicability to IPEC, Entergy's experts fully refute their claims as lacking technical and factual merit.

F. Commitment 42 Is Sufficiently Specific, Has Been Approved by the NRC, and Already Has Been Implemented for IP2

In Commitment 42, Entergy committed to manage the aging effect of cracking due to PWSCC in the steam generator tube-to-tubesheet welds either by: (1) demonstrating that those welds are no longer included in the reactor coolant system ("RCS") pressure boundary function (or

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46 *See* SSER 1 at 3-19 (NYS000160). Entergy currently plans to use EVT-1 inspections using a robot-mounted camera, similar to methods used for inspections of other steam generator components. *See* Entergy's Testimony at A73, A153 (ENT000699).

47 *See* Entergy's Testimony at A141-A143 (ENT000699).

48 *See id.* at A71, A179 (ENT000699). Section V.C.3 of Entergy's Testimony discusses EPRI's SGMP studies, particularly the EPRI 2014 Report issued in October 2014, in detail. *See* EPRI, Final Report 3002002850, Steam Generator Management Program: Investigation of Crack Initiation and Propagation in the Steam Generator Channel Head Assembly (Oct. 2014) (NYS000544A-D) ("EPRI 2014 Report").

[redacted]

are not susceptible to PWSCC); or (2) implementing a one-time inspection on a representative number of welds.[49] At IP2, the analyses or inspections must take place between March 2020 and March 2024 (*i.e.,* between 20 and 24 years of service).[50] At IP3, the analyses or inspections must occur by the end of the first refueling outage during the PEO.[51]

Contrary to Intervenors' claims, Commitment 42 is not vague or inadequate. In fact, Entergy already has implemented Commitment 42 at IP2 by seeking and obtaining an H* license amendment, under "Option 1" of the commitment, to redefine the RCS pressure boundary.[52] Thus, inspections of the tube-to-tubesheet welds at IP2, under "Option 2" of the commitment, are not necessary.[53] With respect to IP3, Entergy is evaluating the EPRI 2014 Report (NYS000544A-D) to determine whether it supports implementation of the analysis option of Commitment 42.[54] Another alternative available to Entergy is to inspect the IP3 tube-to-tubesheet welds under Option 2 of Commitment 42.[55] As documented in the SSER 1, the Staff found that Commitment 42 is sufficiently specific and provides reasonable assurance that the effects of aging for tube-to-tubesheet welds will be adequately managed during the PEO for each unit.[56]

G. Commitment 30 Is Sufficiently Specific, Has Been Approved by the NRC, and Is Being Properly Implemented for IP2 and IP3

In Commitment 30, Entergy committed to participate in industry programs for investigating and managing aging effects on RVIs, to evaluate and implement industry programs

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49 *See id.* at A146-A147 (ENT000699).

50 *See id.* at A146.

51 *See id.*

52 *See id.* at A73, A160 (citing Letter from D. Pickett, NRC, to Vice President, Operations, Entergy, "Indian Point Nuclear Generating Unit No. 2 – Issuance of Amendment re: H* Alternate Repair Criteria for Steam Generator Tube Inspection and Repair (TAC No. MF3369)" (Sept. 5, 2014) ("H* Amendment Issuance") (NYS000542)).

53 *See id.* at A160-A163.

54 *See id.* at A73.

55 *See id.* at A, 73, A164.

56 *See* SSER 1 at 3-22 to 3-23 (NYS000160).

[redacted]

applicable to RVIs, and to submit an RVI inspection plan not less than 24 months before entering the PEO.[57] Entergy's testimony on Contention NYS-25 addresses these matters in detail as well as the adequacy of the IPEC RVI AMP more generally.[58] Insofar as Intervenors raise concerns regarding the adequacy of Commitment 30 and Entergy's compliance with that commitment, they are addressed in Entergy's testimony and position statements on NYS-25 and NYS-26B/RK-TC-1B, as applicable. In short, the LRA complies with Part 54 and is fully consistent with the guidance for acceptable AMPs in NUREG-1801, Revision 1 and Revision 2 because EPRI's Materials Reliability Program ("MRP")-227-A provides an NRC-accepted approach for managing the effects of aging on RVIs, and Entergy's RVI AMP is consistent with MRP-227-A.[59]

* * *

In summary, Entergy's commitments—together with the other aging management activities specified in the LRA—provide reasonable assurance that the aging effects of metal fatigue on the reactor coolant system pressure boundary and RVIs, and the effects of PWSCC on the steam generator components at issue will be managed during the PEO, consistent with 10 C.F.R. §§ 54.21(a)(3), 54.21(c)(1)(iii) and 54.29(a). Intervenors have not carried their burden of providing sufficient evidence to support the claims made in NYS-38/RK-TC-5. Accordingly, NYS-38/RK-TC-5 should be resolved in Entergy's favor.

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57 *See* Entergy's Testimony at A201 (ENT000699) (citing SSER 2, Appx. A at A-11 (NYS000507)).

58 *See generally* Testimony of Entergy Witnesses Nelson F. Azevedo, Robert J. Dolansky, Alan B. Cox, Jack R. Strosnider, Timothy J. Griesbach, Randy G. Lott, and Mark A. Gray Regarding Contention NYS-25 (Embrittlement) (Aug. 10, 2015) ("Entergy's NYS-25 Testimony") (ENT000615).

59 *See* Entergy's Testimony at A201 (ENT000699); MRP-227-A, EPRI Materials Reliability Program: Pressurized Water Reactor Internal Inspection & Evaluation Guidelines (Dec. 2011) ("MRP-227-A") (NRC000114A-F).

[redacted]

II. PROCEDURAL HISTORY OF CONTENTION NYS-38/RK-TC-5

A. Original Contention

In April 2007, Entergy filed its application to renew the operating licenses for IP2 and IP3 for 20 years beyond their current expiration dates of September 28, 2013, and December 12, 2015, respectively. After a notice of opportunity for hearing,[60] the State and Riverkeeper each filed separate petitions to intervene, proposing a number of contentions.[61]

On September 30, 2011, four years later, the State and Riverkeeper jointly proffered NYS-38/RK-TC-5 after the Staff issued its SSER 1.[62] The contention alleged that Entergy's LRA does not comply with requirements of 10 C.F.R. §§ 54.21(a)(3) and (c)(1)(iii) because, rather than presenting AMPs for review by the Board and parties, Entergy instead made vague commitments to develop full AMPs at a later date.[63] Intervenors identified four supporting bases. As summarized by the Board, those bases alleged that Entergy:

> (1) has deferred defining the methods used for determining the most limiting locations for metal fatigue calculations and the selection of those locations; (2) has not specified the criteria it will use and assumptions upon which it will rely for modifying the WESTEMS computer model for environmentally adjusted cumulative usage factors (CUF_{en}) calculations; (3) has not adequately defined how it will manage [PWSCC] because it will not begin inspections until after entering the period of extended operations and Entergy has substituted a document, which will not be released until 2013, for its prior water chemistry program to manage PWSCC of the nickel alloy or nickel-alloy clad steam generator divider plates exposed to reactor

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60 Entergy Nuclear Operations, Inc., Indian Point Nuclear Generating Unit Nos. 2 and 3; Notice of Acceptance for Docketing of the Application and Notice of Opportunity for Hearing Regarding Renewal of Facility Operating License Nos. DPR-26 and DPR-64 for an Additional 20-Year Period, 72 Fed. Reg. 42,134 (Aug. 1, 2007).

61 *See Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 & 3), LBP-08-13, 68 NRC 43, 68-160, 166-190 (2008).

62 *See* State of New York and Riverkeeper's Joint Motion for Leave to File a New Contention Concerning Entergy's Failure to Demonstrate That It Has All Programs That Are Required to Effectively Manage the Effects of Aging of Critical Components or Systems (Sept. 30, 2011) ("Motion for Leave"), *available at* ADAMS Accession No. ML11273A195; State of New York and Riverkeeper's New Joint Contention NYS-38/RK-TC-5 (Sept. 30, 2011) ("Contention NYS-38/RK-TC-5"), *available at* ADAMS Accession No. ML11273A196.

63 *See id*. at 1, 3.

[redacted]

> coolant; and (4) does not adequately describe the contents of its AMP for reactor vessel internals, based on a revised version of the [MRP-227] guidance document.[64]

The bases of the contention challenge six specific Entergy commitments in total. Specifically, Basis (1) relates to IPEC license renewal Commitments 43 and 49, in which Entergy committed to review its design basis fatigue evaluations to determine whether the previously analyzed component locations are the limiting locations for the IPEC plant designs.[65] Basis (2) addresses Commitment 44, in which Entergy committed to document any "user intervention" in future WESTEMS™ fatigue evaluations for IPEC.[66] Basis (3) relates to Commitment 41, in which Entergy committed to inspect the IPEC steam generator divider plates for indications of PWSCC,[67] and Commitment 42, in which Entergy committed to analyze or inspect steam generator tube-to-tubesheet welds for indications of PWSCC.[68] Basis (4) challenges Commitment 30, in which Entergy committed to certain aging management activities related to RVIs.

Entergy and the NRC Staff opposed the admission of NYS-38/RK-TC-5 on both timeliness and substantive admissibility grounds.[69] On November 20, 2011, the Board admitted NYS-38/RK-TC-5.[70]

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64 Licensing Board Memorandum and Order (Admitting New Contention NYS-38/RK-TC-5) at 10-11 n.47 (Nov. 10, 2011) (unpublished) (*citing* Contention NYS-38/RK-TC-5 at 1-3), *available at* ADAMS Accession No. ML11314A211.

65 *See* Contention NYS-38/RK-TC-5 at 1-2 (*citing* SSER at 4-2 (NYS000160) (discussing Commitment 43)).

66 *See id*. at 2 (citing SSER 1 at 4-2 to 4-3 (NYS000160) (discussing Commitment 44)).

67 *See id*. at 2 (citing SSER 1 at 3-18 to 3-19 (NYS000160) (discussing Commitment 41)).

68 *See supra* note 13.

69 *See* Applicant's Opposition to New York State's and Riverkeeper's Joint Motion to Admit New Contention NYS-38/RK-TC-5 (Oct. 25, 2011), *available at* ADAMS Accession No. ML11298A380; NRC Staff's Answer to State of New York and Riverkeeper's Joint Motion to File a New Contention, and New Joint Contention NYS-38/RK-TC-5 (Oct. 25, 2011), *available at* ADAMS Accession No. ML11298A379.

70 *See* Licensing Board Memorandum and Order (Admitting New Contention NYS-38/RK-TC-5) (Nov. 10, 2011) (unpublished), *available at* ADAMS Accession No. ML11314A211.

[redacted]

B. Motion for Clarification

Following the admission of NYS-38/RK-TC-5, Entergy requested clarification regarding the scope of this contention.[71] In its Motion for Clarification, Entergy argued that, based on the Intervenors' pleadings, with respect to the steam generator PWSCC issue, the contention was limited to the adequacy of Entergy's commitment to manage the potential aging effects of PWSCC in steam generator divider plate assemblies (*i.e.*, Commitment 41).[72] Intervenors opposed Entergy's motion.[73] The Board granted the motion, explaining that NYS-38/RK-TC-5 challenged the sufficiency of the information in Entergy's "recent *commitments*" related to the IPEC steam generator divider plate assemblies and tube-to-tubesheet welds.[74]

C. The Board's April 23, 2012 Order Establishing the Initial Hearing Schedule But Deferring All Aspects of NYS-38/RK-TC-5 Relating to NYS-25

On April 23, 2012, the Board issued an Order that included the initial hearing schedule for NYS-38/RK-TC-5, wherein it clarified that "all aspects of NYS-38/RK-TC-5 that relate to NYS-25 [*i.e.*, RVI issues] have been deferred until the NRC Staff releases the second supplement to its FSER [Final Safety Evaluation Report] and litigation resumes on NYS-25."[75] Because Basis (4) relates to NYS-25, it was deferred in accordance with the Board's April 23 Order.[76]

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71 *See* Applicant's Motion for Clarification of Licensing Board Memorandum and Order Admitting Contention NYS-38/RK-TC-5 at 2 (Nov. 21, 2011) ("Motion for Clarification"), *available at* ADAMS Accession No. ML11325A433.

72 *See id.* at 2-3.

73 *See* State of New York and Riverkeeper's Joint Response to Entergy's Motion for Clarification About Contention NYS-38/RK-TC-5 (Dec. 1, 2011), *available at* ADAMS Accession No. ML11335A363.

74 *See* Licensing Board Order (Granting Entergy's Motion for Clarification of Licensing Board Memorandum and Order Admitting Contention NYS-38/RK-TC-5) at 3 (Dec. 6, 2015) ("Order on Motion for Clarification") (emphasis in original), *available at* ADAMS Accession No. ML11340A088.

75 Licensing Board Order (Denying NRC Staff's Motion for Partial Reconsideration and State of New York/Riverkeeper's Cross-Motion to NRC Staff's Motion for Reconsideration) at 7 (Apr. 23, 2012) (unpublished) ("April 23 Order"), *available at* ADAMS Accession No. ML12114A248.

76 *Id.* at 7-8.

[redacted]

D. Entergy's Motion in Limine

Intervenors submitted their original testimony, position statement, and supporting exhibits on June 19 and 20, 2012. On July 6, 2012, Entergy filed a motion *in limine* seeking to exclude those portions of Intervenors' prefiled testimony that challenged the adequacy of Entergy Commitment 42—the commitment concerning Entergy's analysis or inspection of steam generator tube-to-tubesheet welds—which was not mentioned in the bases of the contention as pled by Intervenors and admitted by Board.[77] The NRC Staff supported Entergy's motion as it related to Commitment 42.[78] Intervenors opposed the motion, arguing that limiting contentions to the specific bases pled and admitted would "plunge NRC proceedings into the abyss of common law pleading technicalities" that existed before the modern Federal Rules of Civil Procedure.[79] The Board denied Entergy's motion.[80]

Entergy and the NRC Staff submitted their testimony, position statements, and supporting exhibits on August 20, 2012, and the Intervenors submitted their rebuttal testimony, revised statement of position, and supporting exhibits on November 9, 2012. On January 7, 2013, Entergy filed a motion to strike and motion *in limine* arguing that: (1) certain portions of Intervenors' testimony should be stricken because they raised general objections to the use of engineering judgment in fatigue calculations that were outside the scope of this contention; (2) Dr.

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77 *See* Entergy's Motion in Limine to Exclude Portions of Intervenors' Prefiled Direct Testimony, Expert Report, Statement of Position, and Exhibits for Contention NYS-38/RK-TC-5 (Safety Commitments) at 7-9 (July 6, 2012), *available at* ADAMS Accession No. ML12188A747. Entergy also sought to exclude several exhibits which are unrelated to issues admitted for hearing, and instead speak to Dr. Hopenfeld's purported expertise on unrelated issues. *See id.* at 11-12.

78 *See id.*, Motion Certification.

79 *See* State of New York and Riverkeeper's Joint Answer to Entergy's Motion in Limine to Exclude Portions of Intervenors' Prefiled Direct Testimony, Expert Report, Statement of Position, and Exhibits for Contention NYS-38/RK-TC-5 at 8 (July 16, 2012), *available at* ADAMS Accession No. ML12198A548.

80 *See* Licensing Board Order (Denying Entergy's Motion in Limine Seeking to Exclude Portions of Intervenors' Direct Evidence Addressing Contention NYS-38/RK-TC-5) (Aug. 16, 2012), *available at* ADAMS Accession No. ML12229A432.

[redacted]

Hopenfeld's argument that Entergy should expand the scope of its EAF analyses to include locations where there is no CLB fatigue analysis challenged the CLB and is outside the scope of this proceeding; and (3) the revised statement of position improperly introduced a new argument regarding the interpretation of the rules on "no significant hazards consideration," which was impermissible and outside scope.[81] The NRC Staff also filed a motion *in limine* objecting to certain new arguments from Dr. Hopenfeld regarding the potential for flow-accelerated corrosion and certain wall thickness measurements.[82] These motions remain pending before the Board. Subsequently, the Board placed NYS-38/RK-TC-1B on the schedule for the second set of hearings in this proceeding (*i.e.*, the "Track 2" hearings).[83]

E. New Developments Related to Entergy's AMPs and Commitments

During the period in which the Board deferred litigation on the Track 2 hearing, a number of important developments occurred with respect to the AMPs and commitments challenged by those contentions. First, after EPRI issued the NRC-approved aging management guidance for RVIs in MRP-227-A, Entergy submitted a revised RVI AMP and Inspection Plan for both IP2 and IP3 based on MRP-227-A on February 17, 2012.[84] Given that IP2 and IP3 were among the first units in the U.S. fleet to prepare RVI AMPs based on the state-of-the-art NRC Staff-approved guidance in MRP-227-A, and to have such an AMP reviewed by the NRC Staff as part of an LRA,

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81 *See* Entergy's Motion to Strike Portions of Intervenors' Revised Statement of Position and Motion in Limine to Exclude Portions of the Prefiled Rebuttal Testimony and Exhibits for Contention NYS-38/RK-TC-5 (Safety Commitments) (Jan. 7, 2013), *available at* ADAMS Accession No. ML13007A515.

82 *See* NRC Staff's Motion in Limine to Exclude Portions of the Prefiled Rebuttal Testimony filed by Riverkeeper Concerning Contention NYS-38/RK-TC-5 (Jan. 7, 2013), *available at* ADAMS Accession No. ML13007A516.

83 *See* Licensing Board Order (Granting NRC Staff's Unopposed Time Extension Motion and Directing Filing of Status Updates) at 2 (Feb. 16, 2012) (unpublished), *available at* ADAMS Accession No. ML12047A308.

84 NL-12-037, Letter from F. Dacimo, Vice President, Entergy, to NRC Document Control Desk, License Renewal Application – Revised Reactor Vessel Internals Program and Inspection Plan Compliant with MRP-227-A (Feb. 17, 2012) ("NL-12-037") (NYS000496).

[redacted]

the NRC Staff issued to Entergy detailed RAIs on the RVI AMP from 2012 through 2014.[85] Those RAIs and Entergy's detailed responses thereto are discussed in SSER 2, in which the Staff approved Entergy's revised RVI AMP and RVI Inspection Plan.[86]

Second, to address Commitments 43 and 49, Entergy retained Westinghouse to perform additional EAF reviews to determine whether there are any other potentially leading locations beyond the NUREG/CR-6260 locations, including RVIs.[87] In 2012, Westinghouse completed the screening assessment for non-NUREG/CR-6260 locations and RVIs as part of this process.[88] This screening review included all ASME Class 1 design basis fatigue evaluations, and included all RVI components with CLB CUF fatigue evaluations, consistent with Commitment 43, as clarified in Commitment 49.[89] In 2013 for IP2 and in 2015 for IP3, Westinghouse completed refined evaluations of the non-NUREG/CR-6260 locations and RVIs that were identified as potentially leading locations in the CN-PAFM-12-35 screening analysis.[90] Thus, the limiting locations reviews required by Commitments 43 and 49 have been completed for both IP2 and IP3.[91]

Finally, as noted above, in January 2014, Entergy filed a license amendment request to redefine the RCS pressure boundary, such that the welds would not be required for the pressure

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85 *See* Entergy's NYS-25 Testimony (ENT000615) (citing SSER 2, Appx. B at B-2 to B-7 (NYS000507)).

86 *See* SSER 2 at 3-13 to 3-59 (NYS000507).

87 *See* Entergy's Testimony at A113 (ENT000699).

88 *See* Westinghouse Calculation Note CN-PAFM-12-35, Rev. 1, "Indian Point Unit 2 and Unit 3 EAF Screening Evaluations" (Nov. 26, 2012) ("Westinghouse Calculation Note NC-PAFM-12-35") (NYS000510).

89 *See* Entergy's Testimony at A113 (ENT000699) (citing Westinghouse Calculation Note NC-PAFM-12-35 at 9-11) (NYS000510)).

90 *See id.* (citing Westinghouse Calculation Note CN-PAFM-13-32, Rev. 1, Indian Point Unit 2 (IP2) and Unit 3 (IP3) Refined EAF Analyses and EAF Screening Evaluations (Aug. 19, 2013) ("Westinghouse Calculation Note CN-PAFM-13-32, Rev. 1") (NYS000511); Westinghouse, Calculation Note CN-PAFM-13-32, Rev. 3 "Indian Point Unit 2 (IP2) and Unit 3 (IP3) Refined EAF Analyses and EAF Screening Evaluations" (June 25, 2015) ("Westinghouse Calculation Note CN-PAFM-13-32, Rev. 3") (ENT000683)).

91 *See* Entergy's Testimony at A113 (ENT000699).

[redacted]

boundary function. The NRC granted that license amendment request in September 2014.[92] As a result, Entergy has implemented Commitment 42 for IP2.[93]

F. The Amended Contention

The Board provided Intervenors with an opportunity to file new contentions or amend their existing Track 2 safety contentions following the Staff's publication of SSER 2 in November 2014.[94] Intervenors filed a Joint Motion for Leave to Supplement Previously-Admitted Joint Contention NYS-38/RK-TC-5,[95] on February 13, 2015, focusing on Entergy's RVI AMP. The proposed amendments to NYS-38/RK-TC-5 largely overlapped with the proposed amendments to NYS-25. Specifically, the supplemental bases for NYS-38/RK-TC-5 raise similar claims concerning the need to address synergistic aging effects,[96] the alleged lack of preventive actions,[97] and the need to address potential shock loads on "highly fatigued and embrittled RVI components."[98] Amended NYS-38/RK-TC-5 further alleges that Entergy should dispense with the RVI AMP in favor of "pre-emptive part replacement,"[99] and raises similar concerns regarding the baffle-former bolts and other specific RVI components.[100] Finally, the supplemental bases for

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92 *See* H* Amendment Issuance (NYS000542).

93 *See* Entergy's Testimony at A73, A149 (ENT000699).

94 *See* Revised Scheduling Order at 2.

95 State of New York's and Riverkeeper's Joint Motion for Leave to Supplement Previously-Admitted Joint Contention NYS-38/RK-TC-5 (Feb. 13, 2015), *available at* ADAMS Accession No. ML15044A500; New York State and Riverkeeper February 2015 Supplement Previously-Admitted Joint Contention NYS-38/RK-TC-5 (Feb. 13, 2015) ("NYS-38/RK-TC-5 Supplement"), *available at* ADAMS Accession No. ML15044A498. In addition, Intervenors filed the (1) New York State February 2015 Supplement to Previously-Admitted Contention NYS-25 (Feb. 13, 2015) ("NYS-25 Supplement"), available at ADAMS Accession No. ML15044A491; (2) Declaration of Dr. Richard T. Lahey, Jr. (Feb. 13, 2015) ("2015 Lahey Declaration"), *available at* ADAMS Accession No. ML15044A492; and (3) Declaration of Dr. Joram Hopenfeld (Feb. 12, 2015), *available at* ADAMS Accession No. ML15044A502.

96 *See* NYS-38/RK-TC-5 Supplement at 1 ¶ 5.1.

97 *See id*. at 3, ¶ 12.1.

98 *See id*. at 2, ¶ 5.3.

99 *See id*.

100 *See*, *e.g.*, *id*. at 3, ¶ 12.1.

[redacted]

NYS-38/RK-TC-5 raise essentially the same concerns regarding the Westinghouse EAF analyses as NYS-26B/RK-TC-1B.[101]

Entergy and the NRC Staff opposed Intervenors' proposed supplemental bases for NYS-38/RK-TC-5.[102] Entergy argued that despite the availability of considerable new information developed by EPRI (under the MRP), Westinghouse, Entergy and the NRC directly relevant to the issues raised in their contentions, Intervenors simply repackaged and restated their prior claims without adequately addressing the new information the NRC Staff evaluated and documented in SSER 2.[103] Consequently, Entergy further asserted, Intervenors failed to dispute the most current technical documentation related to their contentions.[104] Notably, Intervenors sought to substantively amend NYS-38/RK-TC-5 only with respect to the RVI AMP—not with respect to the metal fatigue or steam generator-related commitments that also are at issue in NYS-38/RK-TC-5, such that those aspects of the contention remain unchanged.[105]

Nonetheless, on March 31, 2015, the Board found Intervenors' supplemental bases to be "admissible."[106] The Board noted that "Intervenors' proposed supplement does not expand the issues beyond the reasonable scope of the contention as admitted by the Board."[107]

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101 *See*, *e.g.*, *id*. at 3-4, ¶ 12.2.

102 Entergy's Consolidated Answer Opposing Intervenors' Motions to Amend Contentions NYS-25 and NYS-38/RK-TC-5 (Mar. 10, 2015) ("Entergy March 2015 Answer"), *available at* ADAMS Accession No. ML15069A677; NRC Staff's Answer to (1) State of New York's Motion to Supplement Contention NYS-25, and (2) State of New York and Riverkeeper Inc.'s Joint Motion to Supplement Contention NYS-38/RK-TC-5 (Mar. 10, 2015); available at ADAMS Accession No. ML15069A590.

103 *See* Entergy March 2015 Answer at 2.

104 *See id.* at 2-3.

105 *See id.* at 6-7.

106 Licensing Board Memorandum and Order (Granting Motions for Leave to File Amendments to Contentions NYS-25 and NYS-38/RK-TC-5) at 15 (Mar. 31, 2015) (unpublished), *available at* ADAMS Accession No. ML15090A346.

107 *Id.* at 14.

[redacted]

G. Intervenors' June 9, 2015 Evidentiary Submissions and the Parties' June 23, 2015 Joint Stipulation

In accordance with the Board's Revised Scheduling Order of December 9, 2014,[108] as modified on May 27, 2015,[109] New York and Riverkeeper filed revised statements of position, written testimony with affidavits, and exhibits on June 9, 2015.

On June 23, 2015, Intervenors, Entergy, and the NRC Staff submitted a joint stipulation of issues not in dispute with respect to NYS-38/RK-TC-5.[110] The Joint Stipulation notes that, in his Pre-filed Written Supplemental Testimony Regarding Contention NYS-38/RK-TC-5 (June 9, 2015) (NYS000532) ("Supplemental Duquette Testimony"), New York's expert, Dr. David Duquette, "raises certain issues related to vibration-induced wear of steam generator tubes, steam generator tube plugging, and steam generator foreign objects."[111] It further states that "Intervenors aver that that testimony is offered solely for the purpose of presenting Dr. Duquette's opinions on the adequacy of Entergy Commitments 41 and 42 and is not offered as a general challenge to Entergy's Steam Generator Integrity Aging Management Program."[112] That is, Dr. Duquette's opinions must be limited specifically to the adequacy of Commitments 41 and 42 insofar as they describe proposed inspections or analyses with respect to the IPEC steam generator divider plate assemblies and tube-to-tubesheet welds. Specific aging management activities associated with the Steam Generator Integrity AMP are not at issue here.

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108 Revised Scheduling Order at 2.

109 Order (Granting New York's Motion for an Eight-Day Extension of the Filing Deadline) (May 27, 2015), *available at* ADAMS Accession No. ML15147A567.

110 *See* State of New York, Riverkeeper, Inc., Nuclear Regulatory Commission Staff, and Entergy Nuclear Operations, Inc., Joint Stipulation Regarding State of New York Pre-Filed Testimony for Contention NYS-38/RK-TC-5 (Safety Commitments) (June 23, 2015) ("Joint Stipulation"), *available at* ADAMS Accession No. ML15174A081.

111 *Id.* at 1 (citing Duquette Supplemental Testimony at 21:9-23:5).

112 *Id.*

[redacted]

III. APPLICABLE LEGAL AND REGULATORY STANDARDS

As demonstrated below, the Entergy license renewal AMPs and commitments contested by Intervenors in NYS-38/RK-TC-5 fully meet the applicable legal and regulatory requirements in 10 C.F.R. Part 54. In addition to lacking technical merit, Intervenors' claims in NYS-38/RK-TC-5 are legally deficient because they run counter to the limited scope of the license renewal rule and the NRC's reasonable assurance standard in 10 C.F.R. Part 54. Intervenors' arguments also fail to overcome the special weight accorded to NRC Staff guidance documents, fail to carry Intervenors' burden of going forward on their contention, and fail to acknowledge that the use of licensee commitments is a well-established and fully permissible part of the NRC license renewal process.

A. 10 C.F.R. Part 54 Requirements

1. The License Renewal Review Is a Limited One

Drawing from their testimony on their other pending safety contentions, Intervenors' position statement and testimony on NYS-38/RK-TC-5 raise certain issues that are not within the limited scope of this license renewal proceeding. For example, the alleged need to consider "shock loads" involve concerns about "postulated" accidents or events that are beyond the IP2 and IP3 design bases.[113] Similarly, Intervenors' demands for wholesale repair or replacement of RVIs in lieu of an AMP,[114] claims regarding active components not subject to AMPs, such as control rods and control rod drive mechanisms,[115] and criticisms of the recent NRC-approved H* license amendment for IP2[116] are outside the scope of this proceeding. And, as most directly relevant to NYS-38/RK-TC-5, Intervenors' challenges to the adequacy of the NRC Staff's oversight and

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113 *See, e.g.*, Intervenors' Revised SOP at 8-10, 13-14, 29 (NYS000531).

114 *See id.* at 4, 10.

115 *See id.* at 29.

116 *See id.* at 20-21.

[redacted]

enforcement processes—particularly the Staff's reliance on and enforcement of applicant commitments[117]—are not cognizable in this license renewal proceeding.

Specifically, 10 C.F.R. Part 54 is focused on managing the effects of aging on passive, long-lived components. It does not include a review of the adequacy of a plant's CLB, including its design basis.[118] Nor does it include a review of ongoing regulatory matters that are fully addressed under 10 C.F.R. Part 50 and by NRC inspection and enforcement activities.[119] The Commission's license renewal regulations clearly reflect this long-standing, deliberate distinction between Part 54 aging management issues on the one hand, and ongoing Part 50 regulatory process (*e.g.*, the adequacy of the plant's design basis) on the other.[120] Thus, the underlying adequacy of the CLB itself is outside the scope of license renewal and is not open to challenge in this proceeding.[121] The license renewal review is premised upon the determination that, with the exception of aging management issues, the NRC's ongoing regulatory process is adequate to ensure that the CLB of an operating plant provides and maintains an acceptable level of safety.[122]

Additionally, to the extent that Intervenors claim that EAF analyses of primary plant components beyond those with existing CLB cumulative usage factor evaluations are necessary, such claims, in effect, challenge the CLBs for IP2 and IP3, as the review of time-limited aging analyses ("TLAAs") for license renewal is limited to consideration of components with *existing*

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117 *See id.* at 56-57 (NYS000531) ("[I]t appears to the State that many of the 'commitments' Entergy has made during the 2011 dialogue that led to the issuance of [SSER 1] are not only *not* binding or enforceable, but are not even tracked by the NRC Staff.") (emphasis in original).

118 *See* 10 C.F.R. § 54.30(b).

119 *See Fla. Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-01-17, 54 NRC 3,7-9 (2001); *see also Indian Point*, CLI-15-6, slip op. at 8; 10 C.F.R. § 54.21(a)(1).

120 *Turkey Point*, CLI-01-17, 54 NRC at 7; *see also id*. at 9 ("The current licensing basis . . . includes the plant-specific design basis information documented in the plant's most recent Final Safety Analysis Report, and any orders, exemptions, and licensee commitments that are part of the docket for the plant's license . . . .").

121 *See Entergy Nuclear Generation Co. & Entergy Nuclear Operations, Inc.* (Pilgrim Nuclear Power Station), CLI-10-14, 71 NRC 449, 461 (2010); *Oyster Creek*, CLI-09-7, 69 NRC at 270.

122 *See* Final Rule, Nuclear Power Plant License Renewal; Revisions, 56 Fed. Reg. 64, 943, 64,946 (Dec. 13, 1991).

[redacted]

TLAAs.[123] That is, certain in-scope plant components are subject to time-limited calculations or analyses that are part of the CLB, known as TLAAs. TLAAs must be evaluated for the PEO. In doing so, an applicant must: (i) show that the original TLAAs will remain valid for the PEO; (ii) revise and extend the TLAAs to be valid for a longer term, such as 60 years; *or* (iii) otherwise demonstrate that the effects of aging will be adequately managed during the renewal term.[124] Therefore, as relevant to NYS-38/RK-TC-5, the EAF evaluations prepared by Westinghouse for IPEC appropriately address all components with existing CLB cumulative usage factor TLAAs.

In a similar vein, the EAF evaluations are part of the FMP, the program that Entergy is using to resolve the cumulative usage factor TLAAs under 10 C.F.R. § 54.21(c)(iii). Contrary to Intervenors' belief, the CUF analysis is a fatigue analysis, not a general analysis of all aging effects. Therefore, to the extent that Intervenors argue that irradiation embrittlement or other degradation mechanisms (which they claim act "synergistically" with metal fatigue) must be considered in EAF evaluations, their claims are challenges to the CLB and the license renewal rule, as implemented through NRC-approved AMPs—like the FMP—in NUREG-1801. In short, Intervenors are not permitted to expand the scope of Entergy's EAF evaluations to include any components and any aging mechanisms and effects that Intervenors deem relevant.[125]

2. The Reasonable Assurance Standard

Pursuant to 10 C.F.R. § 54.29(a), the NRC will issue a renewed license if it finds that the applicant has identified actions that have been taken or *will be taken* such that there is *reasonable assurance* that the activities authorized by the renewed license will continue to be conducted in

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123 *See Vt. Yankee*, CLI-10-17, 72 NRC at 39 ("TLAAs are *existing* analyses that are part of the plant's [current licensing basis] . . . They are not new analyses.") (emphasis in original).

124 *See* 10 C.F.R. § 54.21(c)(1).

125 In the case of RVI internals, Entergy relies on the RVI AMP to manage the effects of aging on RVI components caused by all pertinent aging mechanisms, including the effects of fatigue, embrittlement, and stress corrosion cracking. *See*, *e.g.*, Entergy's NYS-25 Testimony at A74, A128, A143, A144 (ENT000616).

[redacted]

accordance with the CLB.[126] As discussed herein, Intervenors largely ignore this principle in their NYS-38/RK-TC-5 position statement and testimony in asserting that Entergy inappropriately relies on regulatory commitments or that such commitments are unenforceable by the NRC Staff. In addition to the limitations on the scope of this proceeding set forth in Section 54.21(a)(1), the reasonable assurance standard does not require Entergy to show protection against speculative, "postulated" events that are beyond the design basis of the plant,[127] or to preclude all potential aging effects by replacing components before the PEO.[128] It also requires Intervenors' witnesses provide more than the speculation that generally underlies their various claims—something Drs. Lahey, Hopenfeld, and Duquette plainly fail to do in their testimony on NYS-38/RK-TC-5.

By advocating the immediate replacement of components or the immediate conduct of inspections, Intervenors appear to adopt and apply a new, more stringent legal standard than the reasonable assurance standard codified in 10 C.F.R. Part 54. Longstanding precedent makes clear that the governing reasonable assurance standard does not require an applicant to meet an "absolute" or "beyond a reasonable doubt" standard.[129] Rather, the Commission takes a case-by-case approach, applying sound technical judgment and verifying the applicant's compliance with Commission regulations.[130] NRC guidance further reflects that the license renewal process "is not intended to demonstrate absolute assurance that structures and components will not fail, but rather that there is reasonable assurance" that they will continue to perform their intended functions

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126 10 C.F.R. § 54.29(a).

127 Intervenors' Revised SOP at 8, 14 (NYS000531).

128 *See id.* at 10 (NYS000531).

129 *Oyster Creek*, CLI-09-7, 69 NRC at 262 n.142; *Commonwealth Edison Co.* (Zion Station, Units 1 & 2), ALAB-616, 12 NRC 419, 421 (1980); *N. Anna Envtl. Coal. v. NRC*, 533 F.2d 655, 667-68 (D.C. Cir. 1976) (rejecting the argument that reasonable assurance requires proof beyond a reasonable doubt and noting that the licensing board equated "reasonable assurance" with "a clear preponderance of the evidence").

130 *See Oyster Creek* CLI-09-7, 69 NRC at 262 n.143, 263; *Pilgrim*, CLI-10-14, 71 NRC at 465-66 .

[redacted]

consistent with the CLB during the PEO.[131] Indeed, the plain language of the regulations, and Commission decisions interpreting those regulations, state that the central question for a license renewal application is whether aging management activities have been identified and actions have been or will be taken to provide reasonable assurance of continued safety.[132] By attempting to preclude Entergy's reliance on well-defined and Staff-approved commitments and forcing Entergy to take certain actions now, NYS-38/RK-TC-1 runs directly counter to Part 54's requirements.

B. License Renewal Guidance

Aside from generally (and incorrectly) asserting a lack of details in NYS-38/RK-TC-5, Intervenors do not allege that the IPEC AMPs or commitments in question are inconsistent with NRC guidance. Instead, they attack the propriety of Entergy's reliance on that guidance.[133] While the Commission has not forbidden such arguments, Intervenors face a high bar to overcome the "special weight" accorded to the NRC Staff's guidance on license renewal, particularly the GALL Report, as discussed further below.[134] As explained in this Position Statement and Entergy's Testimony, Intervenors have fallen far short of clearing that bar.

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131 NUREG-1800, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants, Rev. 1, Appx. A at A.1-1 (Sept. 2005) ("SRP-LR, Rev. 1") (NYS000195); NUREG-1800, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants, Rev. 2 (Dec. 31, 2010) ("SRP-LR, Rev. 2") (NYS000161).

132 *See* 10 C.F.R. §§ 54.21(a)(3), 54.29(a)(1).

133 *See*, *e.g.*, Intervenors' Revised SOP at 46 (NYS000531) ("Entergy impermissibly assumes that a commitment to develop a program in the future whose goal it is to meet the requirements of the regulations and to follow the guidance in GALL is legally sufficient to meet its obligations . . . .").

134 *Indian Point*, CLI-15-6, slip op. at 19; *see also NextEra Energy Seabrook, LLC* (Seabrook Station, Unit 1), CLI-12-5, 75 NRC 301, 314 n.78 (2012) ("Although the GALL Report and the Standard Review Plan are guidance documents, and therefore not binding, they do carry special weight."); *Yankee Atomic Electric Co.* (Yankee Nuclear Power Station), CLI-05-15, 61 NRC 365, 375 n.26 (2005) ("We recognize, of course, that guidance documents do not have the force and effect of law. Nonetheless, guidance is at least implicitly endorsed by the Commission and therefore is entitled to correspondingly special weight") (citations and internal quotation marks omitted); *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-01-22, 54 NRC 255, 264 (2001) ("Where the NRC develops a guidance document to assist in compliance with applicable regulations, it is entitled to special weight"), *pet. for review held in abeyance, Ohngo Gaudadeh Devia v. NRC,* 492 F.3d 421 (D.C. Cir. 2007).

[redacted]

The two primary license renewal guidance documents issued by the NRC Staff are NUREG-1801 (the "GALL Report")[135] and NUREG-1800 (the "SRP-LR").[136] The SRP-LR provides guidance to NRC staff for conducting their review of LRAs and provides acceptance criteria for determining whether the applicant has met the regulatory requirements for license renewal.[137]

NUREG-1801 provides the technical basis for the SRP-LR and contains the NRC Staff's generic evaluation of programs that manage the effects of aging during the PEO in accordance with Part 54's requirements.[138] It indicates that many existing, current-term programs are also adequate to manage the aging effects for particular structures or components for license renewal. Thus, programs that are consistent with NUREG-1801 are accepted by the Staff as adequate to meet the license renewal rule.[139] The Commission has endorsed NUREG-1801 because it is based on extensive research and evaluation of operating experience derived from a comprehensive set of sources.[140] NUREG-1801 was also subject to extensive stakeholder review and comment.[141]

The Commission has held that a license renewal applicant's use of the guidance in NUREG-1801 satisfies Part 54 regulatory requirements.[142] As noted above, where the NRC develops a guidance document (such as NUREG-1801) to facilitate compliance with NRC

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135 *See generally* NUREG-1801, Rev. 1 (NYS00146A-C); NUREG-1801, Rev. 2 (NYS00147A-D).

136 *See generally* SRP-LR, Rev. 1 (NYS000195); SRP-LR, Rev. 2 (NYS000161).

137 *See* SRP-LR, Rev. 2 at 1-3 (NYS00161).

138 *See* NUREG-1801, Rev. 1, at 3-4 (NYS00146A).

139 *See id*. at 3.

140 *See* NUREG-1801, Rev. 2, at 2 (NYS00147A).

141 *See id*. Neither NYS nor Riverkeeper, however, submitted comments to the NRC for consideration in NUREG-1801, Rev. 2. *See* NUREG-1950, Disposition of Public Comments and Technical Bases for Changes in the License Renewal Guidance Documents NUREG-1801 and NUREG-1800, at IV-1 to IV-21 (Apr. 30, 2011) (ENT000528) (listing public comments on changes to NUREG-1801 and NUREG-1800).

142 *See*, *e.g.*, *AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), CLI-08-23, 68 NRC 461, 468 (2008).

[redacted]

regulations, that document "is entitled to special weight" in NRC proceedings.[143] For license renewal safety issues, an applicant's use of an AMP identified in NUREG-1801 "*constitutes reasonable assurance* that it will manage the targeted aging effect during the renewal period."[144]

The Commission reiterated this principle in the *Vermont Yankee* license renewal proceeding, holding that a commitment to implement an AMP that the NRC finds is consistent with NUREG-1801 constitutes an "acceptable method for compliance with 10 C.F.R. § 54.21(c)(1)(iii)."[145] Accordingly, to challenge the adequacy of an NRC-approved guidance document, an intervenor must provide specificity and substantial support[146] to overcome the "special weight" accorded to a guidance document that has been implicitly endorsed by the Commission.[147] As demonstrated by Entergy's Testimony, Intervenors have not done so here.

C. Burden of Proof

At the hearing stage, an intervenor has the initial "burden of going forward"; that is, it must provide sufficient, probative evidence to establish a *prima facie* case for the claims made in the admitted contention.[148] The mere admission of a contention does not satisfy this burden.[149] If

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143 *Indian Point*, CLI-15-6, slip op. at 19; *Seabrook*, CLI-12-5, 75 NRC at 314 n.78.

144 *See Oyster Creek*, CLI-08-23, 68 NRC at 468 (emphasis added); *see also Seabrook*, CLI-12-05, slip op. at 4 ("If the NRC concludes that an aging management program (AMP) is consistent with the GALL Report, then it accepts the applicant's commitment to implement that AMP, finding the commitment itself to be an adequate demonstration of reasonable assurance under section 54.29(a).").

145 *Vt. Yankee*, CLI-10-17, 72 NRC at 36.

146 *See id.* at 33 n.185 & 37.

147 *Seabrook*, CLI-12-05, 75 NRC at 314, n.78.

148 *Oyster Creek,* CLI-09-07, 69 NRC at 269 (quoting *Consumers Power Co.* (Midland Plant, Units 1 & 2), ALAB-123, 6 AEC 331, 345 (1973) ("The ultimate burden of proof on the question of whether the permit or license should be issued is . . . upon the applicant. But where . . . one of the other parties contends that, for a specific reason . . . the permit or license should be denied, that party has the burden of going forward with evidence to buttress that contention. Once he has introduced sufficient evidence to establish a prima facie case, the burden then shifts to the applicant who, as part of his overall burden of proof, must provide a sufficient rebuttal to satisfy the Board that it should reject the contention as a basis for denial of the permit or license.") (emphasis in original)); see also Vt. Yankee Nuclear Power Corp. v. Natural Res. Def. Council, 435 U.S. 519, 554 (1978) (upholding this threshold test for intervenor participation in licensing proceedings); Phila. Elec. Co. (Limerick Generating Station, Units 1 & 2), ALAB-262, 1 NRC 163, 191 (1975) (holding that the intervenors had the burden of introducing evidence to demonstrate that the basis for their contention was more than theoretical).

[redacted]

the Intervenors do establish a *prima facie* case on a particular claim, then the burden shifts to Applicant to provide sufficient evidence to rebut the intervenor's contention.[150]

At the admissibility stage, the petitioner has the ironclad obligation to examine the available documentation with sufficient care to support the foundation for a contention.[151] This obligation applies with equal, if not greater force, at the hearing stage.[152] As will be further explained below, Intervenors and their witnesses often disregard or misconstrue key documents (many of which have been proffered by Intervenors themselves) demonstrating the adequacy of Entergy's AMPs and related commitments. Intervenors, therefore, have failed to meet their burden of going forward with evidence to support NYS-38/RK-TC-5.

To prevail, the Applicant's position must be supported by a preponderance of the evidence.[153] Through its expert testimony and supporting evidence, Entergy has done so here.

D. Enforceability of Commitments

Finally, Intervenors' overarching challenge to Entergy's and the NRC Staff's ability to rely on licensee commitments is fundamentally flawed as a legal matter. Demonstrating reasonable assurance through the identification of future actions (*i.e.*, commitments) is a bedrock principle of the NRC's license renewal process.[154] Part 54 specifically authorizes licensees to demonstrate compliance with its requirements via prospective actions to be taken *after* the NRC issues the

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149 *See Oyster Creek*, CLI-09-07, 69 NRC at 268-70.

150 *See, e.g.*, *id*. at 269; *La. Power & Light Co.* (Waterford Steam Elec. Station, Unit 3), ALAB-732, 17 NRC 1076, 1093 (1983) (citing *Consumers Power Co*., ALAB-123, 6 AEC at 345); *see also* 10 C.F.R. § 2.325 (2015).

151 *See Duke Power Co.* (Catawba Nuclear Station, Units 1 & 2), ALAB-687, 16 NRC 460, 468 (1982), *vacated in part on other grounds*, CLI-83-19, 17 NRC 1041 (1983).

152 *See Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 & 3), LBP-13-13, 78 NRC 246, 301 & 301 n.308 (2013) (rejecting an expert's claims based on "some averages" and a "gut feeling," rather than a thorough review of available documentation).

153 *See Diablo Canyon*, ALAB-763, 19 NRC at 577; *Oyster Creek*, CLI-09-07, 69 NRC at 262.

154 *See Vt. Yankee*, CLI-10-17, 72 NRC at 37 ("An applicant may commit to implement an AMP that is consistent with [NUREG-1801] and that *will* adequately manage aging.").

[redacted]

renewed license.[155] This core principle has its genesis in the original 1991 license renewal rule, in which the Commission specified that the license renewal process will rely on new commitments to monitor, manage, and correct age-related degradation unique to license renewal:

> The licensing basis for a nuclear power plant during the renewal term will consist of the current licensing basis and *new commitments* to monitor, manage, and correct age-related degradation unique to license renewal, as appropriate. The current licensing basis includes all applicable NRC requirements and licensee commitments, as defined in the rule.[156]

The Commission affirmed these important principles in the *Vermont Yankee* license renewal proceeding, in which it emphasized that Section 54.29(a) "speaks of both past and future actions, referring specifically to those that '*have been or will be taken* with respect to . . . managing the effects of aging . . . and . . . time-limited aging analyses.'"[157] Moreover, the Commission stated that, in *Oyster Creek*, it "expressly interpreted section 54.21(c)(1) to permit a demonstration *after* the issuance of a renewed license: 'an applicant's use of an aging management program identified in the GALL Report constitutes reasonable assurance that it *will* manage the targeted aging effect during the renewal period.'"[158] Therefore, the Commission

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155 *See, e.g.*, 10 C.F.R. § 54.29(a) (stating "actions have been identified and have been *or will be taken*" with respect to managing the effects of aging and TLAAs) (emphasis added); *see also Turkey Point*, CLI-01-17, 54 NRC at 8 ("Part 54 requires renewal applicants to demonstrate how their programs *will be effective in managing the effects of aging during the proposed period of extended operation*. . . . Applicants must identify any *additional actions*, *i.e.*, maintenance, replacement of parts, etc., *that will need to be taken* to manage adequately the detrimental effects of aging.") (citations omitted) (emphasis added).

156 Nuclear Power Plant License Renewal, 56 Fed. Reg. at 64,946 (emphasis added). In its 1995 revised rule, the Commission reiterated the reliance upon commitments as part of the license renewal process. *See* 1995 License Renewal SOC at 22,473 (NYS000016) (stating that, for the license renewal review, consideration of *written commitments* only need encompass those commitments that concern the capability of systems structures and components, identified in § 54.21(a), integrated plant assessment and §54.21(c) time-limited aging analyses, to perform their intended functions, as delineated in § 54.4(b)).

157 *Vt. Yankee*, CLI-10-17, 72 NRC at 36 (quoting 10 C.F.R. § 54.29(a) (emphasis in original)).

158 *Id.* (citing *Oyster Creek*, CLI-08-23, 68 NRC at 468 (emphasis in original).

[redacted]

reiterated that a commitment to implement an AMP that the NRC finds is consistent with the GALL Report constitutes one acceptable method for compliance with Section 54.21(c)(1)(iii).[159] Intervenors simply ignore the fact that the Commission has repeatedly and definitively confirmed that a fundamental aspect of the Part 54 license renewal process is the requirement for the applicant to *identify* actions that *will be taken*, to make commitments to take such actions, and for the NRC to rely on such commitments in making its reasonable assurance determination.

Importantly, as further explained in Entergy's Testimony, the NRC Staff continuously reviews implementation activities to be performed in connection with commitments as part of its ongoing regulatory oversight process—"separate and apart" from its review of the LRA.[160] Thus, any question as to the adequacy of the NRC Staff's oversight and enforcement activities with respect to commitments are outside the scope of this proceeding.

IV. ENTERGY'S WITNESSES

Entergy's Testimony on NYS-38/RK-TC-5 is sponsored by the expert witnesses identified below. The specific testimony, opinions, and evidence presented by these Entergy experts are based on their very extensive individual and collective technical and regulatory expertise, professional experience, and personal knowledge of the issues raised in NYS-38/RK-TC-5. Collectively, these witnesses demonstrate that NYS-38/RK-TC-5 lacks merit.

A. Mr. Nelson F. Azevedo

Nelson Azevedo's professional and educational qualifications are summarized in his *curriculum vitae*[161] and in Section I.A. of Entergy's Testimony. Mr. Azevedo is employed by

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159 *Id.*

160 *Oyster Creek*, CLI-09-7, 69 NRC at 284 (holding that that review of the applicant's compliance with a commitment to perform a finite element structural analysis of the drywell was not a precondition for granting the renewed operating license); *see also id.* (stating that "review and enforcement of license conditions is a normal part of the Staff's oversight function rather than an adjudicatory matter").

161 *See Curriculum Vitae* for Nelson F. Azevedo (ENT000032).

[redacted]

Entergy as the Supervisor of Code Programs at IPEC. He holds a Bachelor of Science ("B.S.") degree in Mechanical and Materials Engineering from the University of Connecticut, and a Master of Science degree ("M.S.") in Mechanical Engineering from the Rensselaer Polytechnic Institute ("RPI") in Troy, New York. In addition, he holds a Master of Business Administration degree ("M.B.A.") from RPI. Mr. Azevedo has 30 years of professional experience in the nuclear power industry. Mr. Azevedo is qualified through knowledge, skill, directly-relevant experience, training, and education to provide expert witness testimony on Entergy's AMPs and aging management activities related to the commitments challenged in this contention.

In his rebuttal testimony on the metal fatigue contention, Dr. Hopenfeld asserts that, although Mr. Azevedo is responsible for implementing ASME Code programs at IPEC, his *curriculum vitae* does not show expertise in "thermal hydraulics, nuclear safety analysis, or electrochemistry, as would be established by technical publications about such topics."[162] An expert witness, however, "may qualify as an expert by knowledge, skill, experience, training, *or* education."[163] Technical publications are therefore not a prerequisite to qualification as an expert, particularly here, where Mr. Azevedo has 30 years of experience working on directly relevant technical issues at a nuclear power plant. Moreover, Dr. Hopenfeld's *curriculum vitae* shows no published papers on fatigue analysis—which is the primary focus of his testimony in both this contention and NYS-26B/RK-TC-1B—so Dr. Hopenfeld is unqualified by his own standards.[164]

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[162] Prefiled Rebuttal Testimony of Dr. Joram Hopenfeld Regarding Contention NYS-26-B/RK-TC-1B – Metal Fatigue at 9 (June 29, 2012) (RIV000114) ("Hopenfeld Rebuttal Testimony"); *see also id*. at 30 (asserting that Mr. Azevedo has no publications "in the area of material/environment interaction").

[163] *Duke Energy Corp.* (Catawba Nuclear Station, Units 1 & 2), CLI-04-21, 60 NRC 21, 27 (2004) (emphasis added).

[164] *See Curriculum Vitae* of Joram Hopenfeld ("Hopenfeld CV") (RIV000004).

[redacted]

Dr. Hopenfeld also asserts that Mr. Azevedo has "a direct interest in the outcome" of this proceeding, so the impartiality of his testimony is questionable.[165] The value of a witness's testimony, however, is not undermined merely by the fact that the witness is a hired consultant—or employee—of a licensee.[166] Allegations of bias, moreover, require substantial evidentiary support.[167] Dr. Hopenfeld provides no support for his allegations of bias, and, in any event, the impartiality of his testimony would be subject to similar questions.

B. Mr. Robert J. Dolansky

Robert Dolansky's professional and educational qualifications are summarized in his *curriculum vitae*[168] and in Section I.B. of Entergy's Testimony. Mr. Dolansky is employed by Entergy as a Code Programs Engineer at IPEC. He holds a B.S. in Aeronautical Engineering from RPI and has over 22 years of professional experience in the nuclear power industry. Mr. Dolansky is qualified through knowledge, skill, directly-relevant experience, training, and education to provide expert witness testimony on Entergy's AMPs and aging management activities related to the aging management of reactor vessel internals and the management of PWSCC in steam generator divider plates.

C. Mr. Alan B. Cox

Alan Cox's professional and educational qualifications are summarized in his *curriculum vitae*[169] and in Section I.C. of Entergy's Testimony. He holds a B.S. in Nuclear Engineering from the University of Oklahoma and an M.B.A. from the University of Arkansas at Little Rock. He is

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165 *See* Hopenfeld Rebuttal Testimony at 13-14 (RIV000114).

166 *See Metro. Edison Co.* (Three Mile Island Nuclear Station, Unit 1), ALAB-772, 19 NRC 1193, 1211 (1984), *rev'd in part on other grounds*, CLI-85-2, 21 NRC 282 (1985).

167 *Private Fuel Storage, L.L.C.* (Indep. Spent Fuel Storage Installation), LBP-03-8, 57 NRC 293, 341 (2003), *aff'd Private Fuel Storage, L.L.C.* (Indep. Spent Fuel Storage Installation), CLI-03-8, 58 NRC 11 (2003).

168 *See Curriculum Vitae* for Robert J. Dolansky (ENT000522).

169 *See Curriculum Vitae* for Alan B. Cox (ENT000031).

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currently the Technical Manager for License Renewal at Entergy. Mr. Cox has more than 35 years of experience in the nuclear power industry, having served in various positions related to engineering and operations of nuclear power plants, including several years as a licensed reactor operator and a senior reactor operator. Mr. Cox is qualified through knowledge, skill, directly-relevant experience, training, and education to provide expert witness testimony on Entergy's AMPs and aging management activities related to the commitments challenged in this contention.[170]

D. Mr. Jack R. Strosnider, Jr.

Jack Strosnider's professional and educational qualifications are summarized in his *curriculum vitae*[171] and in Section I.D. of Entergy's Testimony. Mr. Strosnider holds a B.S. and an M.S. in Engineering Mechanics, both from the University of Missouri at Rolla, and an M.B.A. degree from the University of Maryland. Mr. Strosnider is a Senior Nuclear Safety Consultant with Talisman International, LLC. Prior to April 2007, he was employed for 31 years by the NRC. During that time, he held numerous senior management positions at the NRC, including Director of the Office of Nuclear Material Safety and Safeguards, Deputy Director of the Office of Nuclear Regulatory Research, and Director of the Division of Engineering in the Office of Nuclear Reactor Regulation ("NRR"). Mr. Strosnider is qualified through knowledge, skill, directly-relevant experience, training, and education to provide expert witness testimony on the NRC regulatory requirements relating to the commitments challenged in this contention.

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170 Although Dr. Hopenfeld claims that Mr. Cox also lacks expertise because he has no published papers in particular technical fields, Mr. Cox is clearly qualified through knowledge, skill, experience, training, and education to testify in this proceeding.

171 *See Curriculum Vitae* for Jack R. Strosnider, Jr (ENT000184).

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E. Mr. Mark A. Gray

Mark Gray's professional and educational qualifications are summarized in his *curriculum vitae*[172] and in Section I.E. of Entergy's Testimony. Mr. Gray is a Principal Engineer in the Primary Systems Design and Repair group at Westinghouse. He holds a B.S. and M.S. in Mechanical Engineering with a Nuclear Certificate from the University of Pittsburgh, and has over 34 years of experience in nuclear component structural analysis. His principal work activities include the evaluation of the structural integrity of primary system piping and components, including the development of plant life extension and monitoring programs and analysis. He is also currently involved in fatigue analysis applications in new plant design. Mr. Gray is qualified through knowledge, skill, directly-relevant experience, training, and education to provide expert witness testimony on fatigue analysis and management issues, including the revised EAF analyses and the use of WESTEMS^{TM} in support of the IPEC license renewal application.

Dr. Hopenfeld claims that Mr. Gray's qualifications are deficient in the "relevant fields" of "forced and natural convection, boundary layers, and turbulence theories."[173] This claim appears to be based on Dr. Hopenfeld's assumptions about Mr. Gray's undergraduate coursework over 30 years ago.[174] Mr. Gray, however, has over 30 years of directly relevant *experience* in such fields and he also holds an M.S. degree.[175] Dr. Hopenfeld also criticizes Mr. Gray's publications, which he suggests have not been subject to "rigorous" peer reviews.[176] Publications at ASME and American Nuclear Society ("ANS") conferences are peer reviewed, and Dr. Hopenfeld does not explain why he thinks such reviews are not "rigorous."

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172 *See Curriculum Vitae* for Mark A. Gray (ENTR00186).

173 Hopenfeld Rebuttal Testimony at 9 (RIV000114).

174 *See id*. ("His undergraduate courses commonly do not cover these subject [sic] in great depths."); *id*. at 20 ("Since his education is limited to basic undergraduate curricula . . . .").

175 *See Curriculum Vitae* for Mark A. Gray (ENTR00186).

176 *See* Hopenfeld Rebuttal Testimony at 20 (RIV000114).

[redacted]

As with Mr. Azevedo, Dr. Hopenfeld questions the impartiality of Mr. Gray's testimony.[177] Once again, Dr. Hopenfeld provides no support for his allegations of bias, and, in any event, the impartiality of his own testimony would be subject to similar questions.

F. Mr. Timothy J. Griesbach

Tim Griesbach's professional and educational qualifications are summarized in his *curriculum vitae* and in Section I.F. of Entergy's Testimony.[178] In brief, he holds B.S. and M.S. degrees in Metallurgy and Materials Science from Case Western Reserve University. Currently, he is a Senior Associate at Structural Integrity Associates, Inc. Mr. Griesbach has more than 40 years of experience in metallurgy and materials engineering, primarily in the nuclear field.

He is a member of the ANS and ASME, where he has served on various ASME Code committees for over 33 years, chairs the ASME Section XI Working Group on Operating Plant Criteria, which involves setting ASME Code requirements for operating pressure and temperature limits for the prevention of brittle fracture of reactor pressure vessels. He also is a member of the ASME Section XI Standards Committee. Thus, Mr. Griesbach is qualified through knowledge, skill, directly-relevant experience, training, and education to provide expert witness testimony on the Entergy RVI AMP, and Entergy's aging management activities and TLAAs for RPVs.

G. Mr. Barry M. Gordon

Barry Gordon's professional and educational qualifications are summarized in his *curriculum vitae* and in Section I.G. of Entergy's Testimony.[179] In brief, he holds a Master of Science degree in Metallurgy and Material Science from Carnegie Mellon University. Currently, he is an Associate at Structural Integrity Associates, Inc., and has more than 45 years of

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177 *See id*. at 9, 13-14, 21.

178 *See Curriculum Vitae* for Timothy J. Griesbach (ENT000617).

179 *See Curriculum Vitae* for Barry M. Gordon (ENT000680).

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experience and expertise in materials corrosion behavior in nuclear power plant environments. Mr. Gordon is a Corrosion Specialist and Fellow at the National Association of Corrosion Engineers ("NACE") International, and has taught a class on "Corrosion and Corrosion Control in LWRs" at the NRC for over a decade.

Before joining Structural Integrity Associates, he spent 23 years at GE Nuclear Energy, where he focused on intergranular stress corrosion cracking ("IGSCC") of austenitic stainless steels and nickel base alloys. Thus, Mr. Gordon is qualified through knowledge, skill, directly-relevant experience, training, and education to provide expert witness testimony on the metallurgical and corrosion aspects of Entergy's FMP, including steam generator PWSCC, in support of the IPEC LRA.

H. Dr. Randy G. Lott

Randy Lott's professional and educational qualifications are summarized in his *curriculum vitae* and in Section I.H. of Entergy's Testimony.[180] In brief, he holds a B.S. in Engineering degree in nuclear engineering from the University of Michigan, and M.S. and Doctor of Philosophy degrees in nuclear engineering from the University of Wisconsin. Currently, he is a Consulting Engineer at Westinghouse and has more than 35 years of experience in nuclear materials and radiation effects.

Dr. Lott has participated in the evaluation of aging degradation or failure of numerous reactor components, including steam generator tubing, BMI flux thimbles, control rod guide tube "split" pins, baffle-former bolts and clevis insert bolts. He also has conducted numerous research programs on highly irradiated stainless steels, including tensile, fracture toughness and IASCC testing, and has been actively involved in the design and implementation of AMPs for reactor

[180] *See Curriculum Vitae* for Randy G. Lott (ENT000618).

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internals. His work on aging management strategies was incorporated into MRP-227-A, which was in turn incorporated into the GALL Report. Thus, Dr. Lott is qualified through knowledge, skill, directly-relevant experience, training, and education to provide expert witness testimony on RVI fatigue analysis in support of the IPEC license renewal application.

V. ENTERGY'S EVIDENCE AND ARGUMENTS

In their testimony, Entergy's experts explain in detail why the commitments challenged by Intervenors—together with substantial other information supporting the LRA regarding the FMP, Water Chemistry Program, and RVI Program—provide reasonable assurance that the effects of aging will be adequately managed throughout the PEO, as required by 10 C.F.R. §§ 54.21(a)(3), 54.21(c)(1)(iii), and 54.29(a). Specifically, Entergy's experts provide detailed testimony on how Entergy plans to effectively manage metal fatigue and PWSCC, in full accordance with the relevant NRC regulations and industry guidance.[181] The NRC's reliance on an applicant's commitments is a well-established practice—one which is fully consistent with the governing regulations and with current plant operations pursuant to Part 50.[182] Entergy's experts also refute Intervenors' flawed claims and preferences point-by-point, thereby demonstrating that the issues raised in NYS-38/RK-TC-5 and Intervenors' associated evidentiary submissions lack merit from both a regulatory and a technical perspective.

A. Intervenors' Overarching Allegations Regarding the Adequacy of Entergy's LRA and Related License Renewal Commitments Lack Merit

In their Position Statement, Intervenors assert that Entergy's LRA "does not contain (1) sufficient information, (2) adequate programs, and (3) enforceable, binding commitments

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[181] *See generally* Entergy's Testimony §§ III, V (ENT000699). *See also generally* Entergy's NYS-25 Testimony (ENT000615); Entergy's NYS-26B/RK-TC-1B Testimony (ENT000679).

[182] *See* Entergy's Testimony § V.A (ENT000699). Notably, Entergy's witnesses note that, in their experience, "all license renewal applicants rely on commitments to demonstrate reasonable assurance." *Id.* at A.92.

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concerning the aging of certain components."[183] As amply demonstrated by Entergy's Testimony on NYS-38-RK-TC-5, and for the reasons summarized below, that assertion lacks merit.

First, there is no factual or legal basis for Intervenors' claim in NYS-38/RK-TC-5 that Entergy's FMP, Water Chemistry Program, and RVI Program and the six related commitments under challenge are "mere promise[s]" and therefore deficient.[184] Contrary to the Intervenors' claims, Entergy is not relying on vague commitments to implement or develop undefined AMPs and activities for purposes of compliance with 10 C.F.R. Part 54. Rather, the necessary AMPs and activities already have been appropriately defined by Entergy and reviewed and approved by the NRC Staff in accordance with NUREG-1800 and NUREG-1801—documents that the Commission repeatedly has identified as being acceptable to demonstrate that an AMP will effectively manage the effects of aging during the PEO.[185] In short, Entergy's LRA demonstrates that there is reasonable assurance that the effects of aging on RVIs, the effects of metal fatigue on RCS components, and the effects of PWSCC on steam generator divider plates and other channel head components will be adequately managed during the PEO, consistent with the requirements of 10 C.F.R. §§ 54.21(a)(3), 54.21(c)(1)(iii), and 54.29(a).[186]

Second, Entergy has provided sufficient information to demonstrate that the aforementioned AMPs are consistent with NUREG-1801, Rev. 1, and that they also meet the intent of NUREG-1801, Rev. 2.[187] Indeed, the NRC Staff has verified the adequacy of Entergy's AMPs relative to NUREG-1801 during its LRA review, which included extensive RAIs and on-

183 *See* Intervenors' Revised SOP at 1 (NYS000531).

184 *See id.* at 51 (NYS000531).

185 *See* Entergy's Testimony at A79, A107, A108 (ENT000699).

186 *See id.* at A64, A208.

187 *See id.* at A63, A208.

[redacted]

site audits.[188] The Staff also performed reviews to evaluate and assess those aging management reviews ("AMRs") or AMPs related to emergent issues, and AMPs that vary somewhat from NUREG-1801 or an NRC-approved precedent (*e.g.*, AMRs and AMPs addressed and approved in an NRC SER of a previous LRA).[189] As documented in its SER and its two supplements, the Staff concluded that the FMP, Water Chemistry Program, and RVI Program are sufficiently detailed and consistent with the corresponding NUREG-programs.

Moreover, as discussed above, SSER 1 in particular explains why Entergy's AMP revisions and commitments provide reasonable assurance that the effects of aging of the subject structures and components will be adequately managed throughout the PEO.[190] In addition, SSER 2 shows that Entergy has completed Commitment 30 at IP2 and IP3, and Commitments 43 and 44 at IP2.[191] With respect to Commitment 30 (regarding RVIs), the Staff reviewed Entergy's RVI AMP and Inspection Plan in detail in SSER 2.[192] Thus, Entergy's LRA, as revised and supplemented as part of the LRA review process, does not lack adequate programs or commitments, as Intervenors erroneously suggest.

Third, Intervenors' assertions that Entergy's license renewal commitments are not binding and enforceable, and that the NRC Staff routinely fails to monitor and track licensee commitments, are groundless. As explained above, licensee commitments are a well-established and essential mechanism for ensuring that licensees implement their AMPs in a timely and

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188 *See*, *e.g.*, SER, Vol. 2 at 3-4 to 3-10 (NYS00326B); NRC, Audit Report for Plant Aging Management Programs and Reviews (Jan. 13, 2009) (ENT000041).

189 *See* SER, Vol. 2 at 3-149 to 3-220 (NYS00326C); *id.* at 3-291 to 294 (NYS00326D).

190 *See* SSER 1 at 3-20 to 3-23 (NYS000160); *id.* at 4-1 to 4.3.

191 *See* SSER 2 at A-11, A-14 (NYS000507).

192 *Id.* at 3-13 to 3-59.

[redacted]

effective manner, and thereby support the NRC's reasonable assurance finding under Part 54.[193] Licensees are subject to NRC enforcement action if they do not properly implement commitments, or do not adhere to the appropriate administrative and regulatory processes in making changes to such commitments—irrespective of how or where those commitments are captured.[194] As such, there is no basis for Intervenors' suggestion that all commitments should be elevated to license conditions, such that they can be changed only through license amendments.[195]

In support of their claims, Intervenors cite a September 2011 audit report prepared by the NRC's Office of Inspector General ("OIG") and a March 2012 letter from the NRC's Director of the Division of Reactor Safety to the Vermont Department of Public Service.[196] Intervenors' reliance on those four-year-old documents, however, is misplaced. In fact, both documents undercut Intervenors' claims and instead bolster the positions of Entergy and the NRC Staff.

Intervenors claim that the OIG Audit Report states that licensee commitments are unenforceable as well as unreliable because they are "not even tracked" by the NRC Staff.[197] As a threshold matter, review and enforcement of licensee commitments is part of the NRC's ongoing Part 50 regulatory oversight function, separate and apart from a license renewal proceeding.[198]

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193 *See Vt. Yankee*, CLI-10-17, 72 NRC at 36; *Diablo Canyon*, CLI-03-2, 57 NRC at 29; Nuclear Power Plant License Renewal, 56 Fed. Reg. at 64,946.

194 *See* Entergy's Testimony at A91 (ENT000699). This fact is not undermined by Judge Karlin's statements during the evidentiary hearing on the Vermont Yankee LRA suggesting that commitments listed in the SER are not binding. *See* In the Matter of Entergy Nuclear Vt. Yankee, LLC and Entergy Nuclear Operations, Inc. (Vt. Yankee Nuclear Power Station), Hearing Transcript (July 23, 2008) (NYS000400). Judge Karlin's *sua sponte* remarks during that hearing do not constitute binding legal authority, much less authority in this proceeding. As discussed above, both commitments contained in the UFSAR and regulatory commitments contained in docketed licensee correspondence with the NRC are enforceable by the Staff.

195 Intervenors' Revised SOP at 42 (NYS000531).

196 *See* Intervenors' Revised SOP at 52-54 (NYS000531) (citing OIG-A-17, Audit of NRC's Management of Licensee Commitments (Sept. 19, 2011) ("2011 OIG Audit Report") (NYS000181); Letter from Christopher G. Miller, NRC to Sarah Hofmann, Vermont Department of Public Service, Regarding Response to Question in State of Vt. Letter of December 23, 2011 (Mar. 20, 2012) ("Vermont Yankee Letter") (NYS000396)).

197 *See* Intervenors' Revised SOP at 57 (NYS000531).

198 *See Oyster Creek*, CLI-09-7, 69 NRC at 284.

[redacted]

The license renewal process is premised on the assumption that the NRC Staff will adequately perform its oversight functions.[199] Thus, challenges to the Staff's regulatory oversight activities are outside the scope of this proceeding.[200] In a similar vein, the Commission has "long declined to assume that licensees will refuse to meet their obligations," given that licensees remain subject to continuing NRC oversight, inspection, and enforcement authority throughout the operating license term.[201] Any suggestion by New York that Entergy will somehow seek to avoid its commitments and fail to adhere to related processes is unsupported, gross speculation.[202]

In any event, the OIG Audit Report, which is now four years old, is devoid of any statements that support Intervenors' flawed interpretation of that report.[203] The report only recommends that the NRC Staff strive for greater consistency in implementing commitment management audits, achieve a better institutional understanding of the definition and use of commitments, and improve its tracking of commitments.[204] It does not conclude, as Intervenors suggest, that licensee or applicant commitments are not binding or enforceable, or that all license renewal commitments must be elevated to license conditions.[205] On the contrary, the OIG concluded that NRC licensee commitments are a valuable regulatory tool, play a key role in facilitating the agency's safety decision-making process, and provide additional assurance to the

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199 *See Turkey Point*, CLI-01-17, 54 NRC at 9.

200 *See Oyster Creek* CLI-09-7, 69 NRC at 284. *Oyster Creek*, *LLC*, CLI-08-23, 68 NRC at 476 ("The NRC has not, and will not, litigate claims about the adequacy of the Staff's safety review in licensing adjudications").

201 *See, e.g., Diablo Canyon*, CLI-03-2, 57 NRC at 29 (in denying a petition to intervene, the Commission held that the intervenor had not provided "any reason (via submission of facts or expert opinion)" to believe that the licensee would fail to meet its regulatory obligations).

202 *See* Entergy's Testimony at A91 (ENT000699).

203 *See id.* at A104.

204 *See id.* (citing 2011 OIG Audit Report at iii, 5, 22-23 (NYS000181)).

205 *Compare* Intervenors' Revised SOP at 56 (NYS000531) (listing the report's actual conclusions) *with id.* at 56-57 (leaping to the conclusion that license renewal commitments "are *not* binding or enforceable" (emphasis in original)).

[redacted]

agency that a licensee action will not adversely affect the safe operation of the plant.[206] Additionally, since issuance of the 2011 OIG Audit Report, the NRC Staff has addressed the OIG's recommendations.[207]

The 2012 Vermont Yankee Letter, in which the NRC Staff responded to specific questions from the State of Vermont concerning Entergy's commitment change process as applied to license renewal commitments for the Vermont Yankee plant, also does not support Intervenors' arguments. Intervenors focus on the NRC Staff's use of the terms "legally binding" and "obligations" in the enclosure to the letter.[208] However, the Staff used those terms to distinguish license conditions, which it referred to synonymously as "obligations," from the other two types of commitments (*i.e.* "mandated licensing bases documents," such as the updated final safety analysis report ("UFSAR"), and "regulatory commitments").[209] Intervenors suggest that the Staff's use of those terms somehow shows that commitments other than license conditions are not enforceable.[210] That is not so.

As explained above, all three types of commitments can be the basis for enforcement action by the NRC in the event of licensee noncompliance.[211] The labels "legally binding" and "obligations" are simply terms used by the NRC in the enclosure to the Vermont Yankee Letter to

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206 *See* Entergy's Testimony at A104 (ENT000699) (citing 2011 OIG Audit Report at 22 (NYS000181)).

207 *See id.* at A105; Memorandum from S. Dingbaum, Assistant Inspector General for Audits, NRC, to M. Satorius, Executive Director for Operations, NRC, "Status of Recommendations: Audit of NRC's Management of Licensee Commitments (OIG-11-A-17)" at 1 (Nov. 25, 2013) ("Final OIG Status Report") (ENT000545) ("All recommendations related to this report are now closed."); *see also* Macfarlane Letter, encl. at 4-7 (ENT000544) (providing the status of Staff action on each of the recommendations in the OIG Report). Notably, former Chairman Macfarlane's letter also noted that "the OIG audit report did not address commitments in the license renewal context. Thus, the OIG audit report's recommendations are not based upon OIG observations about the use of commitments in the license renewal process." Macfarlane Letter, encl. at 4 (ENT000544).

208 *See* Intervenors' Revised SOP at 52 (NYS000531) (citing Vermont Yankee Letter, encl. at 1-2 (NYS000396)).

209 *See* Vermont Yankee Letter, encl. at 1 (NYS000396).

210 *See* Intervenors' Revised SOP at 52 (NYS000531).

211 *See* Entergy's Testimony at A91, A96-A99 (ENT000699).

[redacted]

denote the more stringent controls applicable to license conditions.[212] The Staff explicitly noted that the change control mechanisms and reporting requirements for commitments contained in mandated licensing bases documents like the UFSAR are defined by NRC regulations such as 10 C.F.R. §§ 50.59, 50.54, and 50.71.[213] It further stated that control of regulatory commitments in accordance with licensee programs "is acceptable provided those programs include controls for evaluating changes and, when appropriate, reporting them to the NRC."[214] Finally, the Staff explained that if it "determines that it must rely on certain commitments as part of its approval for the license renewal application, those commitments can be elevated into obligations (*i.e.*, license conditions) ***or*** subsequently incorporated into a mandated licensing basis document," such as the UFSAR.[215]

In summary, for the reasons explained herein and in Entergy's testimony on NYS-38/RK-TC-5, Intervenors' claim that the IPEC LRA does not contain sufficiently detailed information, adequate aging management programs, and enforceable commitments has no support in the record. Entergy has provided sufficient information to demonstrate that the AMPs in question are consistent with NUREG-1801, Rev. 1, and also meet the intent of NUREG-1801, Rev. 2.[216] Insofar as Entergy relies on commitments to take certain actions (a number of which already have

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212 *See* Vermont Yankee Letter, encl. at 1 (NYS000396) ("The escalation of commitments into license conditions (*i.e.*, obligations), requiring prior NRC approval of subsequent changes, is reserved for matters that satisfy the criteria for inclusion in technical specifications by 10 CFR 50.36 or inclusion in the license as a license condition to address a significant safety issue or actions that the NRC staff has relied on to make a finding of reasonable assurance.").

213 *Id.*

214 *Id.* Relatedly, the Staff noted that the guidance contained in NEI 99-04 regarding licensee changes to regulatory commitments has been endorsed by the NRC in Regulatory Issue Summary 2000-17, Managing Regulatory Commitments Made by Power Reactor Licensees to the NRC Staff at 2 (Sept. 21, 2000) (ENT000542). *Id.* at 2. It further noted that the NRC Staff's triennial audit of Entergy's regulatory commitment management program includes an assessment of the implementation of the guidance in NEI 99-04 and the adequacy of any program features that differ from that guidance. *Id.* at 2-3.

215 *Id.* at 2 (emphasis added).

216 *See* Entergy's Testimony at A63 (ENT000699).

[redacted]

been completed), those commitments are well defined; acceptable under NRC regulations, guidance, and Commission adjudicatory precedent; and enforceable by the NRC. Furthermore, Entergy's compliance with, and implementation of, those commitments is subject to inspection and verification by the NRC Staff.[217]

B. Commitments 43 and 49 – Review of Design Basis Fatigue Evaluations

1. Summary of Commitments 43 and 49 and Entergy's Related Actions

In Commitment 43, Entergy committed to review the IPEC "design basis ASME Code Class 1 fatigue evaluations to determine whether the NUREG/CR-6260 locations that have been evaluated for the effects of the reactor coolant environment on fatigue usage are the limiting locations" for IPEC.[218] It also committed to evaluate the "most" limiting location "for the effects of the reactor coolant environment on fatigue usage" if more limiting locations were identified.[219] Entergy agreed to implement Commitment 43 prior to the PEO.[220] In Commitment 49, Entergy clarified that the limiting locations review would include RVI Components.[221] Specifically, Entergy committed to "recalculate each of the limiting CUFs provided in Section 4.3 of the LRA for the reactor vessel internals" prior to entering the PEO.[222]

Entergy's testimony on Contention NYS-26B/RK-TC-1B addresses these matters in detail.[223] In short, Westinghouse has conducted comprehensive new evaluations of all non-

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217 *See generally id.* at A100-A103.

218 *See* Entergy's Testimony at A110 (ENT000699); NL-11-032, Letter from F. Dacimo, Entergy, to NRC Document Control Desk, "Response to Request for Additional Information (RAI), Aging Management Programs," Attach. 2 at 66 (Mar. 28, 2011) ("NL-11-032") (NYS000151).

219 *See* Entergy's Testimony at A101 (ENT000699) (quoting NL-11-032, Attach. 1, at 26 (NYS000151)).

220 *Id.*

221 *See id.* at A111 (citing NL-13-052, Letter from F. Dacimo, Entergy, to NRC Document Control Desk, "Reply to Request for Additional Information Regarding the License Renewal Application," Attach. 1 at 9 (May 7, 2013) ("NL-13-052") (NYS000501); SSER 2 at 3-52 & Appx. A at A-15 (NYS000507)).

222 *See id.* (quoting NL-13-052, Attach. 2 at 20 (NYS000501)).

223 *See id.* at A112 (ENT000699) (citing Entergy's NYS-26B/RK-TC-1B Testimony §§ IV, V.E (ENT000679)).

[redacted]

NUREG/CR-6260 IP2 and IP3 components with CLB CUF evaluations, including RVIs, and confirmed that CUF_{en} values for all limiting locations at IPEC are not projected to exceed 1.0 during the PEO, thereby demonstrating that Entergy will adequately manage the effects of environmentally-assisted fatigue as required by 10 C.F.R. §§ 54.21(a)(3) and (c)(1)(iii).[224]

Entergy completed an initial screening review to determine whether the NUREG/CR-6260 locations are the limiting locations for IPEC on November 9, 2012.[225] That screening review included all ASME Class 1 design basis fatigue evaluations, as well as all RVI components with CLB CUF fatigue evaluations, consistent with Commitment 43, as clarified in Commitment 49.[226] The screening review identified several locations that were potentially more limiting than those identified in NUREG/CR-6260.[227]

As a result, in November 2012, Westinghouse completed a refined EAF evaluation for the IP2 locations identified in Westinghouse Calculation Note CN-PAFM-12-35 as potentially more limiting, including reactor coolant pressure boundary and RVI locations.[228] Entergy thus has fully implemented Commitment 43 and 49 for IP2.[229] Westinghouse also has completed the underlying technical fatigue analyses for Commitments 43 and 49 at IP3.[230] Entergy will formally close Commitments 43 and 49 for IP3 before the period of extended operation.[231]

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224 *See id*.

225 *See id.* at A113 (citing Westinghouse Calculation Note CN-PAFM-12-35 (NYS000510)).

226 *See id.* (citing Westinghouse Calculation Note CN-PAFM-12-35 at 9-11 (NYS000510)).

227 *See id.* (citing Westinghouse Calculation Note CN-PAFM-12-35 at 9-10 (NYS000510)).

228 *See id.* (citing Westinghouse Calculation Note CN-PAFM-13-32, Rev. 1 (NYS000511)).

229 *See id.* (citing Entergy, Commitment Closure Verification Form, LRC # 43 (Aug. 27, 2013) (ENT000708); Entergy, Commitment Closure Verification Form, LRC # 49 (Aug. 27, 2013) (ENT000709)).

230 *See id.* (citing Westinghouse Calculation Note CN-PAFM-13-32, Rev. 3 (ENT000683)).

231 *See id.*

[redacted]

2. Summary of Entergy's Responses to Intervenors' Claims Regarding Commitments 43 and 49

In 2012, Intervenors' experts, Dr. Hopenfeld and Dr. Lahey, both criticized Entergy's Commitment 43 as failing to provide results in time to be tested at a hearing. Dr. Lahey asserted that the results of that review must be "tested and resolved in these ASLB hearings."[232] Similarly, Dr. Hopenfeld stated that "it was not appropriate for the NRC Staff to accept Entergy's vague commitment to determine at some point in the future what additional locations must be analyzed."[233] Those concerns, however, are now moot. As stated above, Entergy has completed its limiting locations review for IP2 and IP3, in accordance with Commitments 43 and 49.[234]

Three years later, Dr. Hopenfeld and Dr. Lahey now contend that Entergy's limiting locations review still do not fulfill Commitments 43 and 49 because it was not properly scoped, used non-conservative inputs and methods, and did not account for combinations of aging mechanisms such as metal fatigue and PWSCC.[235] For the reasons summarized below, their claims lack merit.

Dr. Hopenfeld contends that the first step in the limiting locations review should be "selecting and listing all components that are susceptible to fatigue."[236] But as Entergy's experts

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232 Lahey Testimony at 30 (NYS000374).

233 Hopenfeld Testimony at 11 (RIV000102); *see also id.* ("An actual analysis to determine the most limiting locations must be performed *before* a determination is made about license renewal.") (emphasis in original).

234 *See* Westinghouse Calculation Note CN-PAFM-13-32, Rev. 1 (NYS000511) (documenting completion of IP2 evaluations); Westinghouse Calculation Note CN-PAFM-13-32, Rev. 3 (ENT000683) (documenting completion of IP3 evaluations); Westinghouse Calculation Note CN-PFAM-12-35 (NYS000510) (documenting completion of screening evaluations).

235 *See generally* Lahey Testimony (NYS000374); Pre-filed Written Rebuttal Testimony of Dr. Richard T. Lahey, Jr. Regarding Contention NYS-38/RK-TC-5 Nov. 9, 2012) (NYS000453) ("Lahey Rebuttal"); Revised Lahey Testimony (NYS000562); Hopenfeld Testimony (RIV000102); Prefiled Rebuttal Testimony of Dr. Joram Hopenfeld Regarding Contention NYS-38/RK-TC-5 (RIV000134) ("Hopenfeld Rebuttal"); Supplemental Pre-Filed Written Testimony of Dr. Joram Hopenfeld Regarding Contention NYS-38/RK-TC-5 (June 9, 2015) (RIV000143) ("Supplemental Hopenfeld Testimony"); Supplemental Report of Dr. Joram Hopenfeld in Support of Contention NYS-26/RK-TC-1B and Amended Contention NYS-38/RK-TC-5 ("Supplemental Hopenfeld Report") (June 9, 2015) (RIV000144).

236 Hopenfeld Testimony at 12 (RIV000102); *see also* Supplemental Hopenfeld Report at 25-27 (RIV000144).

[redacted]

explain, the comprehensive design basis fatigue review advocated by Dr. Hopenfeld is not required.[237] The components with CLB CUFs listed in the LRA were selected, based on reviews conducted to develop each plant's CLB, because they were the limiting locations.[238] These locations, determined at the time of the 2004 stretch power uprate or earlier, are now part of the IP2 and IP3 CLB.[239] Therefore, there is no need, for purposes of this license renewal proceeding, to reconsider all plant components and identify a new set of CUF locations, as proposed by Dr. Hopenfeld.[240]

Dr. Hopenfeld further challenges as unsupported Entergy's conclusion that the existing CLB CUF analysis locations were selected because they were the most limiting.[241] More specifically, he asserts that: (1) a component with a limiting CUF may not be limiting under the CUF_{en} analysis; (2) some components were designed to ANSI B31.1, with no CUF; (3) some

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237 *See* Entergy's Testimony at A117 (ENT000699).

238 *See id.* (noting that the CUFs that are in the CLB for IPEC are listed in the LRA at 4.3-9 to 4.3-17, tbls. 4.3-3 (IP2 RPV), 4.3-4 (IP3 RPV), 4.3-5 (IP2 RVIs), 4.3-6 (IP3 RVIs), 4.3-7 (IP2 pressurizer), 4.3-8 (IP3 pressurizer), 4.3-9 (IP2 steam generators), 4.3-10 (IP3 steam generators), 4.3-11 (IP2 control rod drive mechanisms), 4.3-12 (IP3 control rod drive mechanisms)).

239 *See id.* As Entergy's experts explain, the fatigue life of a component is primarily influenced by: (1) a change in the component geometry, (2) a change in the component material, or (3) a change in the method of operation, which could affect the applied loads. *See id.* at A118 (citing ASME Boiler & Pressure Vessel Code, Section III, Article NB-3000, "Design" §§ 3200, 3650 (1989) ("ASME Code, NB-3000") (NYS000349)). None of these parameters is affected by simply increasing the service time of the component from 40 to 60 years. *Id.* (citing ASME Code NB-3000 § 3222.4(e)). Rather, a component's CUF is affected by the number cycles, and cycles are specifically addressed in the fatigue calculations. *Id.* Thus, the locations identified as limiting CUF locations during the initial 40 years of service do not change simply as a result of increased service time (*i.e.*, from 40 to 60 years). *Id.* One or more of the aforementioned CUF-related parameters must change. *Id.*

240 To the extent that Dr. Hopenfeld claims that EAF analyses of primary plant components beyond those with CLB CUF evaluations are necessary, such claims improperly challenge the CLBs for IP2 and IP3. Under 10 C.F.R. § 54.21(c)(1)(iii), the FMP is intended to manage the effects of aging addressed by fatigue TLAAs that are part of the CLB for IP2 and IP3. *See* NUREG-1801, Rev. 1 at X M-1 (NYS00146C) ("In order not to exceed the *design limit* on fatigue usage . . . .") (emphasis added); *see also id.* at X-iii (showing the FMP as an AMP intended to manage the effects of aging associated with a TLAA under Section 54.21(c)(1)(iii)). The CUFs that are in the CLB for IPEC all are listed in LRA Tables 4-3-3 and 4.3-12. It warrants mention that the ASME Code Section XI inservice inspection program provides further assurance of the continued structural integrity of RCS components, including inspections to manage the potential effects of fatigue, regardless of whether a component has a CLB CUF or not. *See* LRA Appx. B § B.1.18 (ENT00015B). Intervenors do not challenge the adequacy of that program in this contention.

241 *See* Hopenfeld Rebuttal at 13-14, 17-18 (RIV000134).

components may be subject to the combined effects of fatigue and PWSCC, in which case the F_{en} methodology is inapplicable; and (4) the original CLB CUF calculations assumed nominal wall thickness, but, in fact, there are large local variations in wall thicknesses.[242]

Entergy's experts fully refute Dr. Hopenfeld's claims as lacking any factual or technical merit in their prefiled testimony.[243] Dr. Hopenfeld's first assertion, *i.e.*, that a limiting CUF may not be limiting under the CUF_{en} analysis, is baseless speculation. Entergy's limiting locations review considered *all* CLB CUF locations and environmental effects for those locations.[244]

Dr. Hopenfeld's second claim challenges the adequacy of the CLB rather than Entergy's evaluation of the CUF TLAA in the LRA. As Entergy's experts explain, Entergy's review under Commitment 43 (and Commitment 49) includes all components at IP2 and IP3 with a CLB CUF, such that a screening CUF_{en} was prepared and evaluated for all relevant locations.[245] Dr. Hopenfeld's argument that Entergy must review components *without* a CLB CUF collaterally attacks NRC regulations. Moreover, contrary to Dr. Hopenfeld's claim, the CUFs included in the limiting locations review did include components originally designed to ANSI B31.1 standards, to identify the limiting Class 1 piping locations.[246]

Dr. Hopenfeld's third allegation regarding the combined effects of fatigue and PWSCC is both misplaced and unsupported. A fatigue analysis is not intended to address PWSCC—it is

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242 *See id.*; *see also* Supplemental Hopenfeld Report at 25-27 (RIV000144).

243 *See* Entergy's Testimony at A119 (ENT000699).

244 *See id.* (citing Westinghouse Calculation Note CN-PAFM-12-35 at 8 (NYS000510) ("Westinghouse has performed EAF screening evaluations for IP2/IP3 that consider all components with a fatigue usage factor listed in the IP2/IP3 LRA."); *see also* Westinghouse Calculation Note CN-PAFM-12-35 at 20 (NYS000510) (explaining the F_{en} application methodology).

245 *See* Entergy's Testimony at A119 (ENT000699) (citing Westinghouse Calculation Note CN-PAFM-12-35 at 8, 20 (NYS000510)).

246 *See id.* (citing [redacted]).

[redacted]

intended to provide reasonable assurance that a component will not experience fatigue cracking.[247] The effects of aging due to PWSCC on susceptible primary plant components, including dissimilar metal welds, are monitored through several inspection programs that address potential cracking (regardless of the underlying aging mechanism), including the ISI Program, the Nickel Alloy Inspection Program, the Reactor Vessel Head Penetration Inspection Program, the Steam Generator Integrity Program, and the RVI AMP.[248] Dr. Hopenfeld overlooks this fact.

Finally, Dr. Hopenfeld's fourth claim regarding alleged local variations in wall thicknesses is both irrelevant and unfounded. Dr. Hopenfeld relies on flow-accelerated corrosion ("FAC") program carbon steel component inspection data to allege deficiencies in EAF evaluation processes for primary plant components that are stainless steel or clad with stainless steel.[249] However, EAF (*environmentally-assisted* fatigue) evaluations are relevant to components subject to the reactor coolant *environment*.[250] Such components are not subject to FAC, as Dr. Hopenfeld readily admits.[251] The use of design geometry in the Indian Point fatigue analyses for primary plant components is acceptable for large-bore piping because, at the time of installation, those components were inspected to confirm they are within design tolerances.[252] Moreover, for all components, potential variations in wall thicknesses are accounted for in the stress indices and design factors in the ASME Code.[253] Deviations in dimensions from the ASME-required wall

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247 *See id.* (citing Entergy's NYS-26B/RK-TC-1B Testimony at A67 (ENTR00183)).

248 *See id.* (citing LRA at B-63 to B-68, B-74 to B-77, B-109 to B-110, B-118 to B-120 (ENT00015B); NL-12-037, Letter from F. Dacimo, Entergy, to NRC Document Control Desk, "License Renewal Application – Revised Reactor Vessel Internals Program and Inspection Plan Compliant with MRP-227-A," Attach. 1 (Feb. 17, 2012) ("NL-12-037") (NYS000496)).

249 *See id.* (citing Hopenfeld Rebuttal at 18 (RIV000134) (citing Hearing Transcript at 1877-1879 (Oct. 17, 2012)).

250 *See id.* (citing GSI-190 Closeout Memorandum at 2 (ENT000190)).

251 *See* Hopenfeld Rebuttal at 13 ("stainless steel is not susceptible to wall thinning by FAC").

252 *See* Entergy's Testimony at A119 (ENT000699).

253 *See id.* (citing ASME Code, NB-3000 §§ 3100, 3680 (NYS000349)).

[redacted]

thicknesses for primary equipment or non-standard piping (like the reactor coolant loop piping) would have been recorded and evaluated in the CLB evaluations per ASME requirements.[254]

Accordingly, for the reasons discussed in Entergy's prefiled testimony on NYS-26B/RK-TC-1B and NYS-38/RK-TC-5 and summarized above, Intervenors' challenges to Commitments 43 and 49 and Entergy's related actions to implement those commitments lack merit.

C. Commitment 44 – User Intervention in WESTEMS™ Fatigue Evaluations

1. Summary of Commitment 44 and Entergy's Related Actions

In Commitment 44, Entergy committed to "include written explanation and justification of any user intervention in future evaluations using the WESTEMS 'Design CUF' module."[255] Entergy originally agreed to implement Commitment 44 within 60 days of issuance of the renewed operating license,[256] but later amended that commitment and agreed to implement Commitment 44 prior to the PEO for consistency with other similar commitments.[257] Entergy has implemented this commitment at IP2 by changing its FMP to incorporate this requirement.[258] The same FMP also applies to IP3, and the commitment will be formally implemented at IP3 before the PEO for that unit begins.[259]

Entergy's prefiled testimony on NYS-26B/RK-TC-1B fully addresses Commitment 44 and Entergy's related actions.[260] In summary, as explained therein, the elimination of redundant peaks and valleys in ASME Code analyses, whether prepared by hand or using computer software, is

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254 *See id.*

255 *See id.* at A121 (citing NL-11-032, Attach. 2 at 18 (NYS000151)).

256 *See id*.

257 *See id.* (citing NL-11-101, Letter from F. Dacimo, Entergy, to NRC Document Control Desk, "Clarification for Request for Additional Information (RAI), Aging Management Programs," Attach. 1, at 2 (Aug. 22, 2011) (NRC000156)).

258 *See id.* at A123 (citing Entergy, Commitment Closure Verification Form, LRC # 44 (June 19, 2013) (ENT000710)).

259 *See id.*

260 *See id.* at A122 (citing Entergy's NYS-26B/RK-TC-1B Testimony § V.B.2 (ENT000679).

[redacted]

conducted according to ASME Code Rules, and the NRC has generically resolved its preliminary concerns with "user intervention."[261] Specifically, Westinghouse used peak editing in one of the EAF analyses that it prepared in support of IPEC license renewal: the pressurizer spray nozzle evaluation for IP2 in Westinghouse Calculation Note CN-PAFM-13-40, Rev. 1.[262] Appendix D of CN-PAFM-13-40 documents the use of peak editing in this evaluation, consistent with Entergy's Commitment 44.[263]

2. Summary of Entergy's Responses to Intervenors' Claims Regarding Commitment 44

Section V.B.2 of Entergy's prefiled testimony addresses Dr. Lahey's and Dr. Hopenfeld's critiques of Commitment 44. As noted therein, Dr. Lahey's June 2015 testimony on Contentions NYS-26B/RK-TC-1B and NYS-38/RK-TC-5 is substantively identical.[264] Similarly, Dr. Hopenfeld's June 2015 report does not distinguish between the two contentions.[265] Therefore, the vast majority of Dr. Lahey's and Dr. Hopenfeld's claims regarding Commitment 44 are addressed in Entergy's testimony on NYS-26B/TK-TC-1B.[266]

In general, Dr. Lahey and Dr. Hopenfeld characterize the selection of inputs for EAF evaluations (such as heat transfer coefficients and loads) as "user intervention," and allege that Entergy has not disclosed all "user intervention" in its EAF evaluations to date.[267] As explained in Entergy's testimony on NYS-26B/TK-TC-1B, they are incorrect. Dr. Lahey's use of the term

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261 *See id.*

262 *See id.* at A123 (citing Westinghouse, Calculation Note CN-PAFM-13-40, Rev. 1, "Indian Point Unit 2 and Unit 3 Pressurizer Spray Nozzle Transfer Function Database Development and Environmental Fatigue Evaluations" (Jan. 15, 2015) (ENT000688 (Proprietary) (Westinghouse Calculation Note CN-PAFM-13-40, Rev. 1).

263 *See id.*

264 *Compare* Revised Lahey Testimony (NYS000562) *with* Revised Lahey Testimony on NYS-26B/RK-TC-1B (NYS000530).

265 *See* Supplemental Hopenfeld Report (RIV000144) (providing a single combined report that does not distinguish between NYS-26B/RK-TC-1B and NYS-38/RK-TC-5).

266 *See* Entergy NYS-26B/RK-TC-1B Testimony § V (ENT000679).

267 *See* Entergy's Testimony at A124 (ENT000699).

[redacted]

"user intervention" is inconsistent with the NRC Staff's use and interpretation of that term. The term "user intervention," as used by the NRC Staff (in SSER 1, for example), does not refer to the general user selection of inputs, such as heat transfer coefficients and loads.[268] Further, it is not possible to eliminate the need for the exercise of specialized engineering expertise in fatigue analyses.[269] Dr. Lahey does not explain why the practice of using engineering judgment to conservatively define input loads—as is done in all ASME Code stress and fatigue analyses, including the Westinghouse EAF evaluations for IPEC—is in any way deficient.[270] In fact, it is hard to imagine any engineering analysis that does not rely, in one way or another, on engineering judgment to define input conditions.

Dr. Hopenfeld similarly argues that Entergy has not disclosed how it will control the modifications of the WESTEMS™ program by the analyst during future evaluations.[271] However, neither Entergy nor Westinghouse has "modified" or "manipulated" any fatigue analyses performed using the WESTEMS™ program.[272] Nor will they do so in the future. Entergy and

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268 *See* Entergy NYS-26B/RK-TC-1B Testimony at A114 (ENT000679).

269 *See id.*

270 Insofar as Dr. Lahey and Dr. Hopenfeld raise general challenges to the use of engineering judgment in fatigue evaluations performed for IPEC license renewal, Entergy's experts address those claims in their testimony on NYS-26B/RK-TC-1B. *See generally id.* §§ V.B.2, V.C, and V.D.8.

271 *See* Hopenfeld Rebuttal at 48-49 (RIV000114).

272 *See* Lahey Testimony at 27 (NYS00374) (stating that the Westinghouse EAF analyses are "strongly influenced" by user "assumptions [and] manipulations" and are, therefore, untrustworthy); Hopenfeld Testimony at 15-16 (RIV000102) (claiming that is Commitment 41 inadequate because it does not "specify[] the modifications to be made to the [WESTEMS™] model, or the process for deciding when and how to have user intervention in the use of the model." Contrary to Intervenors' arguments, Commitment 44 is designed to provide transparency and documentation of adjustments to WESTEMS™ outputs. There is nothing in Commitment 44 that indicates any intent by Entergy or its vendor to "manipulate" the WESTEMS™ code to obtain technically unjustified results. See Entergy NYS-26B/RK-TC-1B Testimony at A116, A125 (ENT000679). Such an action would violate NRC regulations and quality assurance procedures mandated by those regulations. Further, such statements appear to reflect the biases of the Intervenors' and their proffered experts, rather than any valid technical critique. Commitment 44 further supports the NRC Staff's finding of reasonable assurance that the FMP will manage the effects of aging during the PEO for both IPEC units.

[redacted]

Westinghouse have only retained the option to use peak editing to eliminate redundant peaks and valleys, consistent with Commitment 44 in the LRA, which the NRC Staff approved in SSER 1.[273]

In the context of NYS-38/RK-TC-5, Dr. Lahey also alleges that Entergy agreed to disclose user intervention for "future" evaluations, but said nothing about the previous WESTEMS™ evaluations for IP2 and IP3 and the effect that user interventions had on those CUF_{en} results.[274] As explained above, with only one exception (the pressurizer spray nozzle evaluation for IP2) that is fully documented in Westinghouse Calculation Note CN-PAFM-13-40, Rev. 1 (ENT000688), the peak editing that was the subject of the NRC Staff's discussion in the SSER 1 was not used in any of the IPEC EAF analyses completed to date.[275]

In summary, Intervenors' thin claims regarding Commitment 44 lack merit because they are based on an incorrect understanding of the term "user intervention."[276] "User intervention," as that term was used by Entergy and the NRC Staff with respect to Commitment 44 (or more accurately, "peak editing") is a narrow and very specific adjustment to an intermediate result of WESTEMS™ at a specific stage in the fatigue evaluation process.[277] In essence, Intervenors' experts merely *assume* that the Westinghouse EAF analyses contain, or will contain, unspecified and undisclosed assumptions. That is demonstrably false. The voluminous supporting documentation for the completed Westinghouse EAF evaluations—described in considerable

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273 If peak editing is used in the future, then it will be conducted by qualified analysts, and will be conducted consistent with standard ASME Code methods. Furthermore, stress peak and valley selections will be independently reviewed by another qualified engineer, consistent with Westinghouse's standard procedures. Under Commitment 44, NRC reviewers also will be able to independently verify and audit any peak editing performed in IPEC EAF evaluations, during any audits of the IPEC FMP conducted under the Staff's ongoing regulatory authority throughout the PEO. See Entergy NYS-26B/RK-TC-1B Testimony at A118, A125 (ENT000679).

274 *See* Lahey Testimony at 26 (NYS000374); *see also* Revised Lahey Testimony at 71-72 (NYS000562).

275 *See* Entergy's Testimony at A70, A123, A127 (ENT000699).

276 *See generally* Entergy's NYS-26B/RK-TC-1B Testimony §§ V.B.2, V.C, and V.D.8 (ENT000679).

277 *See id*.

[redacted]

detail throughout Entergy's testimony on NYS-26B/TK-TC-1B—fully discloses those assumptions.[278]

D. Commitments 41 and 42 – Steam Generator Inspections

1. Summary of Commitments 41 and 42 and Entergy's Related Actions

At IPEC, the aging effects due to cracking (whether caused by PWSCC or other aging mechanisms) for the steam generator divider plates are managed by the Water Chemistry Program.[279] For the IPEC steam generator tubesheets, the aging effect of cracking is managed by the Water Chemistry and Steam Generator Integrity Programs.[280] The NRC Staff reviewed the IPEC Water Chemistry Program and, in its November 2009 SER, concluded that the program elements are acceptable and consistent with the ten program elements in NUREG-1801, Rev. 1, Section XI.M2.[281] With respect to the Steam Generator Integrity Program, the NRC Staff concluded that the program elements are consistent with the ten program elements in NUREG-1801, Revision 1, Section XI.M19.[282]

As part of the license renewal review process, Entergy made two commitments (Commitments 41 and 42) related to the aforementioned AMPs that further support the NRC Staff's reasonable assurance finding.[283] In Commitment 41, Entergy committed to inspect steam generators for both IPEC units to assess the condition of the divider plate assemblies, using an

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278 *See id.*

279 *See* Entergy's Testimony at A136 (ENT000699) (citing LRA at 3.1-144, 3.1-162 (ENT00015A)).

280 *See id.* (citing LRA at 3.1-10 (ENT00015A)).

281 *See id.* at A140 (citing SER, Vol. 2 at 3-148 (NYS00326C)); *see also* SER, Vol. 2 at 3-241 (noting that cracking due to PWSCC in steam generator divider plates is managed through the Water Chemistry Program, which is consistent with NUREG-1801).

282 *See id.* (citing SER, Vol. 2 at 3-115 (NYS00326C)).

283 *See generally id.* § C.2.b. ("Overview of License Renewal Commitments 41 and 42").

[redacted]

examination technique that will be capable of detecting PWSCC in those assemblies.[284] The IP2 steam generator divider plate inspections will be completed within the first ten years of the PEO for that unit, and the IP3 steam generator divider plate inspections will be completed within the first refueling outage following the beginning of the PEO for that unit.[285]

As explained in Section V.C.2.d of Entergy's Testimony, the inspections under Commitment 41 are adequately defined, as the commitment explicitly confirms that "[t]he examination technique used will be capable of detecting PWSCC in the steam generator divider plate assembly."[286] Entergy plans to conduct EVT-1 inspections using a robot-mounted camera, similar to methods used for inspections of other steam generator components.[287] Such methods would be consistent with the standards in the ASME Code.[288] EVT-1 is an enhanced visual technique capable of detecting tight cracks,[289] and is used in the RVI AMP to detect stress corrosion cracking ("SCC").[290]

In Commitment 42, Entergy committed to manage the aging effect of cracking due to PWSCC in the steam generator tube-to-tubesheet welds either by: (1) demonstrating that those welds are no longer included in the RCS pressure boundary function (or are not susceptible to PWSCC); or (2) implementing a one-time inspection on a representative number of welds.[291] At IP2, the inspection, if performed, would need to take place between March 2020 and March 2024

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284 *See id.* at A143 (citing NL-11-074, Letter from F. Dacimo, Entergy, to NRC Document Control Desk, "Response to Request for Additional Information (RAI), Aging Management Programs" (July 14, 2011) ("NL-11-074") (NYS000152); NL-11-090, Letter from F. Dacimo, Entergy, to NRC Document Control Desk, "Clarification for Request for Additional Information (RAI), Aging Management Programs" (July 27, 2011) (NYS000153)).

285 *See id.*

286 *See id.*; *see also id.* at A72, A152.

287 *See id.* at A153.

288 *See id.* (citing ASME Code, IWA-2000 § 2210 (ENT000531)).

289 *See id.* (citing MRP-227-A at 5-21 to 5-22 (NRC000114B)).

290 *See id.* (citing NL-12-037, Attach. 2 at 37-50, tbls. 5-2, 5-3 (NYS000496)).

291 *See id.* at A146-A147.

[redacted]

(*i.e.,* between 20 and 24 years of service).[292] At IP3, the analyses or inspections must occur by the end of the first refueling outage during the PEO.[293]

Entergy already has implemented Commitment 42 at IP2 by seeking and obtaining a license amendment, under "Option 1" of the commitment, to redefine the RCS pressure boundary.[294] Thus, inspections of the tube-to-tubesheet welds at IP2, under "Option 2" of the commitment, are not necessary.[295] Entergy is in a position to pursue either option (*i.e.*, analysis or inspection) under Commitment 42 with respect to IP3.[296]

As documented in its SSER 1, the NRC Staff reviewed both commitments and found them to be acceptable.[297] The Staff concluded that Entergy has demonstrated that the effects of aging for steam generator divider plate assemblies and tube-to-tubesheet welds will be adequately managed so that their intended functions will be maintained consistent with the CLB during the PEO, as required by 10 C.F.R. §§ 54.21(a)(3) and 54.29(a).

2. Summary of Entergy's Responses to Intervenors' Claims Regarding Commitments 41 and 42

a. Response to Intervenor Criticisms of Commitment 41

Intervenors' experts, Dr. Lahey and Dr. Duquette, criticize Commitment 41 as vague, broadly claiming that it does not describe: (1) the inspection methodology; (2) the number of steam generators to be inspected; (3) the acceptance criteria; or (4) corrective action criteria; and

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292 *See id.* at A145 (citing NL-11-032, Attach. 1 at 23 (NYS000151)).

293 *See id.*(citing NL-11-032, Attach. 1 at 24 (NYS000151)).

294 *See id.* at A160. Specifically, on Jan. 16, 2014, Entergy filed a license amendment request to redefine the reactor coolant pressure boundary, such that the welds would not be required for the pressure boundary function. *See* NL-14-001, Letter from J. Ventosa, Entergy, to NRC Document Control Desk, "Proposed License Amendment for Alternate Repair Criteria for Steam Generator Tube Inspection and Repair, Indian Point Unit Number 2" (Jan. 16, 2014) (NYS000539) ("H* LAR"). This is a well-established process that has led to license amendments for numerous other plants. On Sept. 5, 2014, the NRC granted that license amendment request. *See* H* Amendment Issuance (NYS000542)

295 *See* Entergy's Testimony at A160-A163 (ENT000699).

296 *See id.* at A164.

297 *See id.* at A146 (citing SSER 1 at 3-19, 3-23 (NYS000160)).

[redacted]

(5) monitoring and trending protocols.[298] For the reasons explained by Entergy's experts in their testimony, those criticisms are unfounded.

As an initial matter, Commitment 41 is sufficiently specific and performance-based, as it explicitly requires that Entergy use an inspection technique that is "capable of detecting PWSCC in the divider plate assembly."[299] As Entergy's experts explain, qualified techniques for detecting PWSCC exist, including the remote visual technique (EVT-1) discussed above.[300] Further, the commitment states that the steam generators at both units will be inspected.[301] There is no ambiguity here either—all eight steam generators at the two units will be inspected. In addition, the examination acceptance criteria are implicit in the commitment. The purpose of the inspections is to detect cracking, and any detected flaws will be evaluated to determine the appropriate corrective action, consistent with the IPEC 10 C.F.R. Part 50, Appendix B corrective action program.[302] Finally, if a flaw is detected, then it must be properly dispositioned under the Entergy Quality Assurance Program.[303] This program includes the quality assurance elements for all AMPs in the IPEC LRA, including the corrective action, confirmation process, and administrative controls elements.[304] With regard to the alleged lack of monitoring and trending protocols, such protocols are not necessary for one-time inspections.[305]

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298 *See id.* at A156 (citing Revised Lahey Testimony at 94 (NYS000562); Prefiled Written Testimony of Dr. David J. Duquette Regarding Contention NYS-38/RK-TC-5, at 28 (June 14, 2012) (NYS000372) ("Duquette Testimony")).

299 *See id.* (citing SSER 2, Appx. A at A-13 (NYS000507)).

300 *See id. see also id.* at A154.

301 *See id.* (citing SSER 2 at A-13 (NYS000507)).

302 *See id.* (citing SRP-LR, Rev. 2 at A.1-6 to A.1-7 (NYS000161)).

303 *See id.*

304 *See id.* (citing LRA at A-17, A-44, B-2 to B-3 (ENT00015B); SER, Vol. 2 at 3-214 to 3-216 (NYS00326C)).

305 *See id.*

[redacted]

b. Response to Intervenor Criticisms of Commitment 42

Dr. Duquette and Dr. Lahey present similar (and also unfounded) criticisms with respect to Commitment 42.[306] As explained in Entergy's Testimony, no inspections are necessary under the analysis option for Commitment 42, given that the NRC Staff already has approved Entergy's license amendment, which uses the well-established H* methodology.[307] That methodology, which is based on a structural and leakage evaluation for the steam generator tubes, redefines the primary coolant pressure boundary to the height above the bottom of the tubesheet, below which degradation would not affect the primary coolant pressure boundary function.[308] Entergy's NRC-approved H* license amendment is now part of the IP2 CLB and, therefore, is not subject to challenge in this license renewal proceeding.[309]

With regard to IP3, sufficient information is available in the record on inspection methods and techniques, acceptance criteria, monitoring and trending, and corrective actions—in the event that Entergy opts to perform inspections (as opposed to analyses) under the commitment.[310] With regard to inspection techniques, there is no requirement to specify the particular techniques to be used at this time. In any event, as Entergy's experts explained, capable inspection techniques are available to perform the inspections scheduled for the spring of 2017.[311] If any weld cracking is

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306 *See* Duquette Testimony at 28 (NYS000372); Lahey Testimony at 22 (NYS000374).

307 *See* Entergy's Testimony at A158 (ENT000699) (citing H* Amendment Issuance (NYS000542)).

308 *See id.* at A161 (citing Westinghouse, WCAP-17091-NP, Rev. 0, H*: Alternate Repair Criteria for the Tubesheet Expansion Region in Steam Generators with Hydraulically Expanded Tubes (Model 44F) (June 2009) ("WCAP-17091-NP") (ENT000570)).

309 *See id.* at A162 ("[T]hese changes are now part of the IPEC licensing basis and will be maintained during the PEO in accordance with the NRC-issued license amendment.") . Notably, Intervenors did not seek to intervene in the IP2 H* license amendment proceeding. *See* Biweekly Notice; Applications and Amendments to Facility Operating Licenses and Combined Licenses Involving No Significant Hazards Considerations, 79 Fed. Reg. 15,144 15,147 (Mar. 18, 2014).

310 *See* Entergy's Testimony at A158, A166 (ENT000699).

311 *See id.* at A166. As Entergy's experts explain, inspections performed to satisfy Commitment 42 could be done using a robot-mounted camera, similar to the planned divider-plate inspections. *See id.* Other possible options include using a liquid-penetrant surface examination, or eddy current surface examination from the inside of the

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identified during those inspections, then the condition(s) must be resolved through a repair or engineering evaluation and an ongoing monitoring program will be established.[312] More generally, Commitment 42, which, as noted above, the NRC Staff found acceptable, meets all ten elements of an acceptable AMP.

3. Miscellaneous Intervenor Criticisms of Commitments 41 and 42 Based on Other Steam-Generator-Related Information

As discussed in Section V.C.2.f of Entergy's Testimony, Intervenors make several other arguments based on information that relates to steam generators but not to the specific issues raised in NYS-38/RK-TC-5. For example, Dr. Lahey cites a 2012 nuclear safety advisory letter issued by Westinghouse, NSAL-12-1, "Steam Generator Channel Head Degradation" (NYS000549), for the proposition that significant cladding and weld degradation has been observed in an operating Westinghouse-designed steam generator. He asserts that, "[i]f left unchecked, this degradation could lead to aggressive wastage of the lower head of the steam generator in question," and "failure of a primary pressure boundary, or the divider plate."[313]

Dr. Lahey's dire claim is not germane here. Entergy's experts explain in their testimony that the discovery of the general corrosion to which Dr. Lahey alludes is unrelated to the PWSCC concerns that led to Entergy's Commitments 41 and 42.[314] NSAL-12-1 describes [redacted]

steam generator tubes, both of which are approved methods in the ASME Code. *See id.* (citing ASME Code, IWA-2000 §§ 2222, 2223 (ENT000531)). Entergy will select the appropriate method closer to the inspection time, based on the methods that are then available. *See id.*

312 *See id.* at A158 (citing SSER 1, Appx. A at A-24 (NYS000160)).

313 Revised Lahey Testimony at 99 (NYS000562).

314 *See* Entergy's Testimony at A168 (ENT000699).

[redacted][315] [redacted]

[redacted][316]

[redacted] Subsequently, in August 2013, EPRI issued Final Report No. 3002000473, "Steam Generator Channel Head Degradation Failure Modes and Effects Analysis" (ENT000716). The EPRI report endorsed the inspection recommendations in NSAL-12-1.[319] As documented in the Steam Generator Examination Program Results (*see* NYS000537 and NYS000543), Entergy has performed remote video camera inspections on all eight steam generators (not only six, as Dr. Duquette incorrectly suggests on pages 12-13 and 19-20 of his Supplemental Testimony (NYS000532)) at IPEC [redacted].[320] Those inspections yielded acceptable results as analyzed under the applicable acceptance criteria.

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315 *See id.* (citing NSAL-12-1 at 2 (NYS000549)).

316 *See id*. (citing NSAL-12-1 at 3 (NYS000549)).

317 *See id.* at A169 (quoting NSAL-12-1 at 1 (NYS000549)).

318 *See id.* at A169 (citing NSAL-12-1 at 5 (NYS000549)).

319 *See id.* The NRC subsequently issued Information Notice 2013-20 on Oct. 3, 2013, in which it reviewed channel head inspection findings from the foreign plant referenced in NSAL-12-1 and domestic inspection results from Wolf Creek and Surry Unit 2. *See generally* NRC Information Notice 2013-20, "Steam Generator Channel Head and Tubesheet Degradation" (Oct. 3, 2013) ("IN 2013-20") (NYS000538).

320 *See* Entergy's Testimony at A170 (ENT000699) (citing NL-13-032, Letter from R. Walpole, Entergy, to NRC Document Control Desk, "Technical Specification 5.6.8 - IP3 Steam Generator Tube Inspection Report – Spring 2013 Refueling Outage," at 1 (Aug. 15, 2013) ("NL-13-032") (NYS000537) ("The scope of the inspection included all four steam generators . . . ."); *id.*, Encl 1. at § 3.0; NL-14-13, Letter from J. Ventosa, Entergy, to

[redacted]

Dr. Duquette raises various other issues in his testimony, but to no avail. For instance, citing the steam generator tube issues at San Onofre Nuclear Generating Station ("SONGS"), he claims to be "concerned about the numerous indications of vibration-induced wear in the steam generator tubes at IP2, as documented in the plant's most recent tube inspection report."[321] However, he fails to provide any technical basis for his concerns, or explain why those concerns are relevant to the adequacy of Entergy's Commitments 41 or 42.[322] For the reasons set forth in Entergy's Testimony, Dr. Duquette's other claims regarding foreign objects (including a fuel alignment pin) trapped in IPEC steam generator tubes, indentations on steam generator tubes, the operating experience discussed in NSAL-12-1, and previous cracking in since-replaced IP2 Alloy 600 steam generator tubes all lack relevance and/or a supporting technical basis.

4. Intervenor Criticisms of EPRI's Studies of PWSCC in Steam Generator Components

a. EPRI's Steam Generator Studies

As discussed at length in Section V.C.3 of Entergy's Testimony, the EPRI SGMP Engineering and Regulatory Technical Advisory Group has completed multiple studies of divider plate cracking in response to foreign (non-U.S.) operating experience.[323] Those studies

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NRC Document Control Desk, "Steam Generator Examination Program Results 2014 Refueling Outage (2R21)," Attach. 1 at 2 (describing inspections of "all four steam generators" including the "primary bowl drain area") (Sept. 8, 2014) ("NL-14-113") (NYS000543)).

321 Prefiled Written Supplemental Testimony of Dr. David J. Duquette Regarding Contention NYS-38/RK-TC-5, at 21 (June 9, 2015) (NYS000532) ("Supplemental Duquette Testimony").

322 *See* Entergy's Testimony at A171 (ENT000699). Vibration-induced tube wear is a separate issue from PWSCC in the divider plate (or tube-to tubesheet welds). *See id.* Dr. Duquette articulates no connection between the two technical issues. *See id.* At SONGS, a significant design error caused the replacement steam generators to be subjected to substantially more severe thermal-hydraulic conditions than expected, which, in concert with other factors, contributed to rapid steam generator tube wall degradation shortly after installation. *See id.* (citing Memorandum from M. Johnson, DEDO, to M. Satorius, EDO, "Review of Lessons Learned from the San Onofre Steam Generator Tube Degradation Event" at 2 (Mar. 6, 2015) ("SONGS Lessons Learned Memo") (NYS000552)). The current IPEC steam generators all have been in service for years and do not suffer from this design defect. *See id.*

323 *See generally* EPRI 2014 Report (NYS000544A-D); EPRI, Final Report No. 1020988, Steam Generator Management Program: Phase II Divider Plate Cracking Engineering Study (Nov. 2010) (ENT000523)("EPRI Phase II Study").

[redacted]

culminated in the EPRI 2014 Report issued in October 2014.[324] [redacted] Based on these studies, EPRI has concluded that divider plate cracking in steam generator models like those installed at IPEC is not a significant safety issue.[326]

With respect to the tube-to-tubesheet welds, EPRI determined that tube-to-tubesheet welds will generally have sufficient chromium content to be resistant to the initiation or propagation of PWSCC.[327] [redacted]

[redacted]

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324 [redacted]

[redacted]

326 *See* Entergy's Testimony at A71, A179 (ENT000699) (citing [redacted]

327 *See id.* at A189 (citing [redacted])).

328 *See id.* (citing [redacted])).

329 *See id.*

330 *See id.*

[redacted] Nevertheless, despite all of the reasons why this scenario is unlikely, EPRI prepared a flaw tolerance and crack growth evaluation in Chapter 4 of the report. The flaw tolerance evaluation determined that an allowable flaw in the channel head would be 3.9 inches in thickness.[332] The crack growth evaluation assumed that a large (0.25-inch) hypothetical initial flaw in the divider plate would propagate from the triple point towards the channel head via a corrosion fatigue mechanism for duration of 40 years.[333] The flaw tolerance evaluation showed that even after 40 years worth of transients, the postulated crack would remain smaller than necessary to challenge ASME Code requirements.[334]

In short, the EPRI 2014 Report demonstrates that the potential PWSCC locations of concern are mitigated via either chromium enrichment or compressive stress conditions during operations, or both.[335] [redacted] Nonetheless, as discussed above, as part of the NRC license renewal process, Entergy has committed to perform the inspections and/or analyses described in Commitments 41 and 42.

b. Intervenor Criticisms of EPRI's Steam Generator Studies

Dr. Duquette and, to a lesser extent, Dr. Lahey, attempt to undermine Entergy's potential reliance on the findings in the various EPRI studies, particularly the EPRI 2014 Report. Their arguments, however, rely on inaccurate characterizations of the EPRI 2014 Report and

331 *See id.* (citing EPRI 2014 Report at 7-7 (NYS00544D)).

332 *See id.* (citing EPRI 2014 Report at 4-38 (NYS000544C)).

333 *See id.* (citing EPRI 2014 Report at 7-8 (NYS000544D)).

334 *See id.* (citing EPRI 2014 Report at 4-38 (NYS000544C)).

335 *See id.* (citing EPRI 2014 Report at 7-2 (NYS00544D)).

336 *Id.* (quoting EPRI 2014 Report at 7-10 (NYS00544D)).

[redacted]

unsupported technical assertions. Importantly, Entergy's experts directly refute Dr. Duquette's claim that the EPRI 2014 Report's findings are limited to steam generators with a projected life span of 40 years and thus cannot be considered bounding through the period of extended operation (*i.e.*, 60 years).[337]

[redacted]

Dr. Lahey states that the EPRI studies do not resolve his concerns regarding the alleged effects of shock loads, which he claims could cause gross failure of the divider plate and

[337] The IP2 steam generators were installed in 2000, and thus will not exceed 40 years of age during the IP2 PEO, which ends in 2033. The IP3 steam generators, which were installed in 1989, will not reach 40 years of age until 2029, which is only six years before the conclusion of the IP3 PEO in 2035. *See* Entergy's Testimony at A148 (ENT000699).

[redacted]

[redacted]

compromise core cooling.[342] Like Dr. Duquette's arguments, Dr. Lahey's assertions lack technical support. While Dr. Lahey does not specifically define what "shock loads" he is concerned about, he appears to be principally concerned with the potential effect of a thermal or pressure shock loads on a divider plate that has been "seriously age-weakened" by "thermal fatigue or PWSCC-induced embrittlement."[343] However, as the name denotes, PWSCC, causes cracking, not embrittlement of susceptible materials.[344] [redacted] Thus, there simply is no technical basis for Dr. Lahey's claim that EPRI has left a significant safety issue unaddressed.

E. Commitment 30 – Reactor Vessel Internals Program

In Commitment 30, Entergy committed to participate in industry programs for investigating and managing aging effects on RVIs, to evaluate and implement industry programs applicable to RVIs, and to submit an RVI inspection plan not less than 24 months before entering the PEO.[346] Entergy's testimony on Contention NYS-25 addresses these matters in detail as well as the adequacy of the IPEC RVI AMP more generally.[347] Insofar as Intervenors raise concerns regarding the adequacy of Commitment 30 and Entergy's compliance that commitment, Entergy

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342 *See* Lahey Rebuttal at 8-9, 12-13 (NYS000453); Revised Lahey Testimony at 91-92, 101 (NYS000562).

343 Revised Lahey Testimony at 93 (NYS000562).

344 *See* Entergy's Testimony at A191 (ENT000699) (citing EPRI, MRP-175, Materials Reliability Program: PWR Internals Material Aging Degradation Mechanism Screening and Threshold Values at A-1 (Dec. 2005) ("MRP-175") (NYS000319)).

345 [redacted]

346 *See id.* at A201 (citing SSER 2, Appx. A at A-11(NYS000507)).

347 *See generally* Entergy's NYS-25 Testimony (ENT000616).

[redacted]

addresses those concerns in its testimony and position statements on NYS-25 and NYS-26B/RK-TC-1B, as applicable.

VI. CONCLUSION

Intervenors have not met their burden to establish any deficiency in the Entergy commitments at issue in NYS-38/RK-TC-5. Entergy is not relying on vague commitments. Nor is it relying on undefined AMPs for purposes of compliance with Part 54. Entergy's LRA complies fully with the applicable criteria in NUREG-1801. Necessary aging management programs and activities have *already* been appropriately and sufficiently defined by Entergy and thoroughly reviewed by the NRC Staff, in accordance with NUREG-1800 and NUREG-1801—documents prepared at the Commission's direction and that the Commission has repeatedly identified as a way to demonstrate that an AMP will effectively manage the effects of aging during the period of extended operation. The results of the Staff's in-depth safety reviews are documented in its SER and two supplements thereto. Thus, as the Staff explicitly found in those documents, there is reasonable assurance that the aging effects of metal fatigue on the reactor coolant system pressure boundary and RVIs, and the effects of PWSCC on the steam generator components at issue will be managed during the PEO, consistent with 10 C.F.R. §§ 54.21(a)(3), 54.21(c)(1)(iii) and 54.29(a). Accordingly, for all of these reasons, NYS-38/RK-TC-5 should be resolved in Entergy's favor.

[redacted]

Respectfully submitted,

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

William B. Glew, Esq.
Entergy Nuclear Operations, Inc.
440 Hamilton Avenue
White Plains, NY 10601
Phone: (914) 272-3202
Fax: (914) 272-3205
E-mail: wglew@entergy.com

Kathryn M. Sutton, Esq.
Paul M. Bessette, Esq.
Raphael P. Kuyler, Esq.
MORGAN, LEWIS & BOCKIUS LLP
1111 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
Phone: (202) 739-3000
Fax: (202) 739-3001
E-mail: ksutton@morganlewis.com
E-mail: pbessette@morganlewis.com
E-mail: rkuyler@morganlewis.com

Counsel for Entergy Nuclear Operations, Inc.

Dated in Washington, D.C.
this 10th day of August 2015

DB1/ 84299020