

**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 20, 2012

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

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Pursuant to 10 C.F.R. § 2.1207(a)(1) and the Atomic Safety and Licensing Board’s (“Board”) Order Memorializing Items Discussed During the July 9, 2012, Status Conference,¹ Entergy Nuclear Operations, Inc. (“Entergy”) submits this Statement of 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 (“NYS” or “the State”) and Riverkeeper, Inc. (“Riverkeeper”) (jointly “Intervenors”). This Statement is supported by the Testimony of Nelson F. Azevedo, Robert J. Dolansky, Alan B. Cox, Jack R. Strosnider, Jr., Robert E. Nickell, and Mark A. Gray (“Entergy’s Testimony”) (Entergy Exhibit ENT000521), and the exhibits thereto.² For the reasons discussed below, NYS-38/RK-TC-5 lacks merit and should be resolved in Entergy’s favor.

¹ Licensing Board Order (Memorializing Items Discussed During the July 9, 2012, Status Conference) at 2 (July, 12, 2012) (unpublished).

² See Entergy Exhibits ENT00015A-B, ENT000031, ENT000032, ENT000041, ENT000184, ENTR00185, ENTR00186, ENT000190, ENT000192, ENT000196, ENT000197, ENT000230, ENT000251, ENT000252, and ENT000522 to ENT000572.

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 define and describe in sufficient detail certain aging management programs (“AMPs”) and aging management activities and is, instead, relying on vague commitments to satisfy its regulatory burden. Specifically, the contention—and the testimony of the Intervenor’s witnesses submitted in support of the contention—Dr. Joram Hopenfeld for Riverkeeper and Drs. Richard T. Lahey Jr. and David J. Duquette for the State³—alleges deficiencies in four Entergy commitments that the Nuclear Regulatory Commission (“NRC” or “Commission”) Staff previously approved in either the November 2009 SER⁴ or the August 2011 SSER:⁵

- Commitment 43 – regarding Entergy’s review of its design basis fatigue evaluations to determine whether the previously analyzed component locations are the limiting locations for the Indian Point plant designs;
- Commitment 44 – regarding “user intervention” in future environmentally-assisted fatigue (“EAF”) evaluations; and
- Commitment 41 and 42 – regarding inspections of steam generator components for primary water stress corrosion cracking (“PWSCC”).⁶

³ See Prefiled Written Testimony of Dr. Joram Hopenfeld Regarding Contention NYS-38/RK-TC-5 (June 19, 2012) (“Hopenfeld Test.”) (RIV000102); Pre-filed Written Testimony of Dr. David J. Duquette Regarding Contention NYS-38/RK-TC-5 (June 19, 2012) (“Duquette Test.”) (NYS000372); Report of Dr. David J. Duquette in Support of Contention NYS-38/RK-TC-5 (June 19, 2012) (“Duquette Report”) (NYS000373); Pre-filed Written Testimony of Dr. Richard T. Lahey, Jr. Regarding Contention NYS-38/RK-TC-5 (June 19, 2012) (“Lahey Test.”) (NYS000374).

⁴ NUREG-1930, Safety Evaluation Report Related to the License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3 (Nov. 2009) (“SER”) (NYS000326).

⁵ NUREG-1930, Supp. 1, Safety Evaluation Report Related to the License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3 (Aug. 2011) (“SSER”) (NYS000160).

⁶ The contention also challenges the adequacy of Entergy Commitment 30 (regarding reactor vessel internals). The Board, however, has deferred the submittal of pre-filed written testimony on this issue. See 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) (ordering that evidentiary submissions be prepared for NYS-38/RK-TC-5 and stating that “all aspects of NYS-38/RK-TC-5 that relate to NYS-25 [the fourth basis] have been deferred”). Entergy’s Testimony and this Statement, therefore, do not

Beyond the adequacy of Entergy’s commitments, Intervenor also generally challenge the adequacy of Entergy’s aging management activities for metal fatigue and steam generator PWSCC. Entergy refutes their claims point-by-point, and shows that the contention lacks merit.

In accordance with applicable NRC regulations, guidance, and long-standing precedent, Entergy’s commitments—together with substantial other information in the LRA regarding the relevant aging management activities—provide reasonable assurance that the effects of aging will be adequately managed. This is precisely what is required for license renewal. Indeed, Entergy has already done much of what the Intervenor demand—to the extent those demands are grounded in NRC regulations or guidance. Namely, Entergy’s LRA described specific AMPs that are consistent with all ten elements of the NRC-approved AMPs in NUREG-1801,⁷ and contain considerable detail on the methods, criteria, assumption and timing of aging management activities. The AMPs are supplemented by commitments from Entergy to undertake specific activities to *implement* those AMPs in the future—commitments that are enforceable by the NRC under its long-standing regulatory processes.⁸ Entergy’s aging management activities have been reviewed by the NRC Staff and approved in the SER and the SSER.

address this issue. Entergy will respond to any testimony to be filed on deferred issues in accordance with future Board orders.

⁷ NUREG-1801, General Aging Lessons Learned Report, Rev. 1 at 2-3(Sept. 2005) (“NUREG-1801, Revision 1”) (NYS00146A).

⁸ See *AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), CLI-09-7, 69 NRC 235, 284 (2009), *aff’d sub nom. N.J. Env’tl. Fed’n v. NRC*, 645 F.3d 220 (3d Cir. 2011). See also *AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), LBP-06-7, 63 NRC 188, 207 (2006) (accepting a licensee commitment as satisfying a regulatory obligation); *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); *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.”).

Further, as Entergy demonstrates, to the extent the Intervenor demand more, their demands are both inconsistent with the NRC's regulations and technically unsupported. From a regulatory perspective, Intervenor disregard the principles that fundamentally underpin the license renewal rules in 10 C.F.R. Part 54, the plain language of the regulations, and Commission decisions interpreting those regulations—all of which are premised on the adequacy of the NRC's current-term, ongoing regulatory oversight processes.⁹ In addition, the focus of the license renewal safety review is on the "limited" question of whether aging management activities have been identified and actions have been or *will be taken* to provide reasonable assurance of continued safety.¹⁰ Accordingly, Intervenor's demands for implementation details, such as particular inspection protocols, would impose more stringent requirements than those set forth in the license renewal rules in 10 C.F.R. Part 54.¹¹ Further, Intervenor demand that AMP implementation commitments and details be elevated to license conditions is both impractical and contrary to longstanding NRC precedent and process.

With respect to the three non-deferred bases of this contention, Entergy's testimony shows that the Intervenor's challenges lack merit, as follows:

1. Basis (1): Commitment 43 – Review of Design Basis Fatigue Evaluations: The nature and timing of the evaluations to be conducted under Commitment 43 are clearly

⁹ *Fla. Power & Light Co.* (Turkey Point Nuclear Plant, Units 3 & 4), CLI-01-17, 54 NRC 3, 9 (2001) ("In establishing its license renewal process, the Commission did not believe it necessary or appropriate to throw open the full gamut of provisions in a plant's current licensing basis to re-analysis during the license renewal review."); *Pac. Gas and Elec. Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-11-11, 74 NRC ___, slip op. at 10 (Oct. 12, 2011) ("license renewal should not include a new, broad-scoped inquiry into compliance that is separate from and parallel to [our] ongoing compliance oversight activity.") (citations and quotations omitted).

¹⁰ *N. States Power Co.* (Prairie Island Nuclear Generating Plant, Units 1 & 2), CLI-10-27, 72 NRC 481, 489 (2010) (emphasis added) (describing the Commission's "long-standing position that license renewal proceedings should be limited in scope").

¹¹ With respect to fatigue analyses, binding Commission precedent is very clear that the completion of environmentally-assisted fatigue ("EAF") analyses is not a prerequisite to the granting of a renewed license. See *Vt. Yankee*, CLI-10-17, 72 NRC at 34.

established in the record. The initial screening reviews and any subsequent EAF evaluations under Commitment 43 will use standard ASME Code methods, will use the NRC-approved guidance on EAF, and will, as appropriate, use the same WESTEMSTM software as the EAF evaluations completed to date. The commitment will be implemented prior to the period of extended operation (“PEO”), consistent with the Commission’s decision in *Vermont Yankee*.¹² Commitment 43 meets the intent of NUREG-1801, Revision 2.

2. Basis (2): Commitment 44 – User Intervention in WESTEMSTM Fatigue Evaluations: Peak editing, or “user intervention,” to remove redundant stress peaks and valleys in the context of a WESTEMSTM fatigue evaluation, is consistent with the longstanding, established ASME Code methodology for conducting stress and fatigue evaluations. It does not involve “manipulations and interventions” or the modification of WESTEMSTM as Intervenors allege without any basis or evidence. Entergy’s Metal Fatigue Testimony fully explained this issue, but Intervenors’ testimony on NYS-38/RK-TC-5 ignores this explanation entirely.
3. Basis (3): Commitments 41 and 42 – Steam Generator Inspections: The nature and timing of the evaluations to be conducted under Commitment 41 and 42¹³ are clearly established in the record. Recent foreign operating experience identified the *potential* for PWSCC to affect steam generator divider plates. Although the Electric Power Research Institute (“EPRI”) has concluded that this issue is not a safety concern for the steam generators at IPEC, Entergy has nevertheless committed to undertake timely and specifically-defined analyses and inspections to confirm the effectiveness of its Water Chemistry Program in managing the aging effects of PWSCC.

In sum, the Intervenors have not met their burden¹⁴ to establish any deficiency in the Entergy commitments at issue here. Entergy is not relying on vague commitments, nor is it relying on undefined AMPs for purposes of compliance with Part 54. Entergy’s LRA is fully compliant with the applicable criteria in NUREG-1801, Revision 1, and meets the intent of

¹² *Id.*

¹³ Following the admission of NYS-38/RK-TC-5, the Board clarified that this basis is not limited to Commitment 41. 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, 2011) (unpublished) (“Order on Motion for Clarification”); Licensing Board Order (Denying Entergy’s Motion in Limine Seeking to Exclude Portions of Intervenors’ Direct Evidence Addressing Contention NYS-38/RK-TC-5) at 4 (Aug. 16, 2012) (unpublished) (“Order on Motion in Limine”). Entergy’s testimony, therefore, addresses Commitment 42. In providing this testimony, Entergy does not concede that this topic is properly within the scope of this contention, as pled and admitted. See *NextEra Energy Seabrook, LLC* (Seabrook Station, Unit 1), CLI-12-05, 75 NRC ___, slip op. at 10-11 & n.50 (Mar. 8, 2012).

¹⁴ See *Oyster Creek*, CLI-09-7, 69 NRC at 269 (2009) (holding that the proponents of a contention have the burden of moving forward with sufficient evidence to show a deficiency in a LRA).

NUREG-1801, Revision 2. 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-1800¹⁵ 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 PEO. Accordingly, there is reasonable assurance that the aging effects of metal fatigue on the reactor coolant system (“RCS”) pressure boundary 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).

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

A. Original Contention

On April 23, 2007, Entergy filed its application to renew the operating licenses for IPEC Units 2 and 3 (“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,¹⁶ the State and Riverkeeper each filed separate petitions to intervene, proposing a number of contentions.¹⁷

¹⁵ See NUREG-1800, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants, Rev. 1 (Sept. 2005) (“SRP-LR, Revision 1”) (NYS000195).

¹⁶ 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).

¹⁷ See *Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 & 3), LBP-08-13, 68 NRC 43, 68-160, 166-190 (2008).

On September 30, 2011, four years later, the State and Riverkeeper jointly proffered contention NYS-38/RK-TC-5.¹⁸ The contention alleges that Entergy:

is not in compliance with the requirements of 10 C.F.R. §§ 54.21(a)(3) and (c)(1)(iii) and the requirements of 42 U.S.C. §§ 2133(b) and (d) and 2232(a) because Entergy does not demonstrate that it has a program that will manage the affects [sic] of aging of several critical components or systems and thus NRC does not have a record and a rational basis upon which it can determine whether to grant a renewed license to Entergy as required by the Administrative Procedure Act.¹⁹

Intervenors alleged that, rather than presenting AMPs for review by the Staff, Board, and parties, Entergy has instead made vague commitments to develop full AMPs at a later date.²⁰

Intervenors cited four bases, which were summarized by the Board as follows:

1. Entergy has deferred defining the methods used for determining and selecting the most limiting locations for metal fatigue calculations;
2. Entergy has not specified the criteria it will use and the assumptions it relied upon to modify the WESTEMS™ computer model for environmentally adjusted cumulative usage factors (“CUF_{en}”) calculations;
3. Entergy has failed to adequately define how it will manage PWSCC because it has not yet begun inspections or released documentation on how it will manage the effects of aging due to PWSCC in steam generator divider plates; and
4. Entergy has not adequately described the contents of its AMP for reactor vessel internals, based on the revised version of the EPRI

¹⁸ 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.

¹⁹ See Contention NYS-38/RK-TC-5 at 1.

²⁰ See *id.* at 1, 3.

Materials Reliability Program 227 (MRP-227) guidance document.²¹

The bases of the contention challenge four specific Entergy commitments. Bases (1) and (2) challenge commitments that support Entergy's Fatigue Monitoring Program ("FMP"). Specifically, Basis (1) relates to IPEC license renewal Commitment 43, 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.²² Basis (2) addresses Commitment 44, in which Entergy committed to document any "user intervention" in future WESTEMSTM fatigue evaluations for Indian Point.²³ Basis (3) relates to Commitment 41, in which Entergy committed to inspect the Indian Point steam generator divider plates for indications of PWSCC,²⁴ and Commitment 42, in which Entergy committed to analyze or inspect steam generator tube-to-tubesheet welds for indications of PWSCC.²⁵

Entergy and the NRC Staff opposed the admission of NYS-38/RK-TC-5 on both timeliness and substantive grounds.²⁶ On November 20, 2011, the Board admitted NYS-38/RK-TC-5, finding that "the broader legal question of how much information Entergy must provide to show it can manage the effects of aging before entering the period of extended operations, and

²¹ 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). As previously noted, the Board has deferred litigation of this last basis.

²² *See* Contention NYS-38/RK-TC-5 at 1-2 (*citing* SSER at 4-2 (NYS000160) (discussing Commitment 43)).

²³ *See id.* at 2 (*citing* SSER at 4-2 to -3 (NYS000160) (discussing Commitment 44)).

²⁴ *See id.* at 2 (*citing* SSER at 3-18 to -19 (NYS000160) (discussing Commitment 41)).

²⁵ *See supra* note 13.

²⁶ *See* Applicant's Opposition to New York State's and Riverkeeper's Joint Motion to Admit New Contention NYS-38/RK-TC-5 at 10 (Oct. 25, 2011) (objecting to Commitment 30 on timeliness grounds, because the commitment had been on the docket for over four years), *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) (objecting to all aspects of this contention as untimely because the relevant information was available prior to issuance of the SSER), *available at* ADAMS Accession No. ML11298A379.

whether Entergy has met its regulatory burden to show enough of that information” is material to the NRC’s decision whether to grant Entergy’s license renewal application,²⁷ and that Intervenor’s raised a genuine dispute over the adequacy of Entergy’s “recent commitments.”²⁸ The Board also held that the contention was timely because it targeted Entergy’s recently modified commitment as described in the SSER.²⁹

B. Motion for Clarification

Following the admission of NYS-38/RK-TC-5, Entergy requested clarification regarding the scope of this contention.³⁰ In its Motion for Clarification, Entergy argued that, based on the Intervenor’s pleadings, with respect to the steam generator PWSCC issue, this 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 41.³¹ Riverkeeper and the State opposed Entergy’s motion.³² The Board granted the Motion for Clarification, explaining that NYS-38/RK-TC-5 challenged the sufficiency of the information in Entergy’s “recent commitments.”³³

²⁷ Licensing Board Memorandum and Order (Admitting New Contention NYS-38/RK-TC-5) at 11 (Nov. 10, 2011) (unpublished).

²⁸ *Id.* at 11-12.

²⁹ *Id.* at 10. The Board’s ruling did not explain how this analysis covers Basis (4) (Commitment 30), which has not been modified since 2007, more than four years before Intervenor proffered this contention. *See* SSER at A-18 (NYS000160) (*citing* NL-07-039, Letter from F. Dacimo, Entergy, NRC Document Control Desk, “Indian Point Energy Center License Renewal Application” (Apr. 23, 2007)).

³⁰ *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.

³¹ *See id.* at 4.

³² *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.

³³ *See* Order on Motion for Clarification at 3.

C. Entergy's Motion in Limine

The Intervenors submitted their Testimony, 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 the 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 the Intervenors and admitted by Board.³⁴ The NRC Staff supported Entergy's motion as it related to Commitment 42.³⁵ The 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 modernization of the Federal Rules of Civil Procedure (“FRCP”).³⁶ The Board denied Entergy's motion.³⁷

III. APPLICABLE LEGAL AND REGULATORY STANDARDS

This section discusses the legal and regulatory standards governing the adjudication of this contention and refutes the erroneous legal and regulatory claims advanced by the Intervenors in their Position Statement.³⁸

³⁴ 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. The Order on Motion in Limine does not address this aspect of Entergy's motion.

³⁵ *See id.* at 13.

³⁶ 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) (“Entergy's Motion in Limine for NYS-38/RK-TC-5”), *available at* ADAMS Accession No. ML12198A548.

³⁷ *See* Order on Motion in Limine at 4.

³⁸ State of New York and Riverkeeper, Inc. Initial Statement of Position in Support of Joint Contention NYS-38/RK-TC-5 (June 20, 2012) (“Intervenors' Position Statement”) (NYS000371).

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

1. License Renewal Technical Requirements

Under the governing regulations in Part 54, the review of license renewal applications is confined to matters relevant to the PEO requested by the applicant. The Commission has stated that “[a]djudicatory hearings in individual license renewal proceedings will share the same scope of issues as our NRC Staff review, for our hearing process (like our Staff’s review) necessarily examines only the questions our safety rules make pertinent.”³⁹ The Commission has specifically limited its license renewal safety review to the matters specified in 10 C.F.R. §§ 54.21 and 54.29(a)(2), which focus on the management of aging of certain systems, structures, and components (“SSCs”), and the review of time-limited aging analyses (“TLAAs”).⁴⁰

Certain in-scope components are subject to time-limited calculations or analyses that are part of the current licensing basis (“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.⁴¹

2. The Reasonable Assurance Standard

Pursuant to Section 54.29(a), for safety issues, 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

³⁹ *Turkey Point*, CLI-01-17, 54 NRC at 10; *see also* Nuclear Power Plant License Renewal; Revisions, 60 Fed. Reg. 22,461, 22,482 n.2 (May 8, 1995) (“1995 License Renewal SOC”) (NYS000016).

⁴⁰ *See Turkey Point*, CLI-01-17, 54 NRC at 7-8; *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 & 2; Catawba Nuclear Station, Units 1 & 2), CLI-02-26, 56 NRC 358, 363 (2002).

⁴¹ *See* 10 C.F.R. § 54.21(c)(1).

is *reasonable assurance* that the activities authorized by the renewed license will continue to be conducted in accordance with the CLB.⁴²

Longstanding precedent makes clear that the reasonable assurance standard does not require an applicant to meet an “absolute” or “beyond a reasonable doubt” standard.⁴³ Rather, the Commission takes a case-by-case approach, applying sound technical judgment and verifying the applicant’s compliance with Commission regulations.⁴⁴ In the license renewal context, Branch Technical Position RLSB-1, in the SRP-LR, explains 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 consistent with the CLB during the PEO.⁴⁵ 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.⁴⁶ Importantly, these regulations do not require the applicant to demonstrate that aging

⁴² 10 C.F.R. § 54.29(a).

⁴³ *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”).

⁴⁴ *See Oyster Creek*, CLI-09-7, 69 NRC at 262 n.143, 263; *Entergy Nuclear Generation Co. (Pilgrim Nuclear Power Station)*, CLI-10-14, 71 NRC 449, 465-66 (2010).

⁴⁵ SRP-LR, Revision 1, Appx. A, at A.1-1 (NYS000195); NUREG-1800, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants, Rev. 2 (Dec. 2010) (“SRP-LR, Revision 2”) (NYS000161).

⁴⁶ *See* 10 C.F.R. §§ 54.21(a)(3), 54.29(a)(1).

effects be precluded,⁴⁷ but are oriented in large part toward identifying actions that will be taken in the future.⁴⁸

B. License Renewal Guidance

1. Compliance With NUREG-1801 Constitutes Reasonable Assurance

NUREG-1801, Revision 1 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, and meet the requirements of 10 C.F.R. Part 54.⁴⁹ NUREG-1801, Revision 1 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, Revision 1 are accepted by the Staff as adequate to meet the license renewal rule.⁵⁰ 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.⁵¹ NUREG-1801 is also subject to stakeholder review and comment.⁵²

⁴⁷ See *Seabrook*, CLI-12-05, slip op. at 3, 18.

⁴⁸ See *Vt. Yankee*, CLI-10-17, 72 NRC at 36. While Intervenor's cite numerous NRC and judicial cases on pages 32 to 34 of their Position Statement, most of the decisions are several decades old and none have any meaningful connection to license renewal. In any event, the general legal principles for which those cases stand have not been violated here. Entergy's Testimony demonstrates that there has been no exclusion of material safety issues from the scope of this proceeding or deferral of their resolution until after the hearing. Nor is the factual record lacking in details on Entergy's AMPs.

⁴⁹ See NUREG-1801, Revision 1, at 3-4 (NYS00146A).

⁵⁰ See *id.* at 3. In December 2010, the NRC Staff issued NUREG-1801, Revision 2. See NUREG-1801, Generic Aging Lessons Learned Report, Rev. 2 (Dec. 2010) ("NUREG-1801, Revision 2") (NYS00147A-D). As explained further below, these AMPs meet the intent of NUREG-1801, Revision 2 because the relevant substantive changes to the Staff's guidance are addressed in Entergy's New Commitments 41, 42, and 43.

⁵¹ See NUREG-1801, Rev. 2, at 2 (NYS00147A).

⁵² 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. 2011) (ENT000528) (listing public comments on changes to NUREG-1801 and NUREG-1800).

The Commission has held that a license renewal applicant's use of the guidance in NUREG-1801 satisfies regulatory requirements under 10 C.F.R. Part 54.⁵³ Also, where the NRC develops a guidance document—such as NUREG-1801—to assist in compliance with applicable regulations, that document “is entitled to special weight” in NRC proceedings.⁵⁴ In particular, 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.”⁵⁵ The Commission recently reiterated this principle, 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).”⁵⁶ These holdings strongly suggest that the Commission disagrees with a fundamental premise of this contention, namely that a license renewal applicant's commitment to comply with NUREG-1801 is insufficient. To challenge the adequacy of an NRC-approved guidance document, an intervenor must provide specificity and substantial support⁵⁷ to overcome the “special weight” accorded to a guidance document that has been implicitly endorsed by the Commission.⁵⁸

⁵³ See, e.g., *AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), CLI-08-23, 68 NRC 461, 468 (2008).

⁵⁴ *Seabrook*, CLI-12-05, slip op. at 16 n.78 (quoting *Private Fuel Storage, L.L.C.* (Indep. Spent Fuel Storage Installation), CLI-01-22, 54 NRC 255, 264 (2001)); see also *id.* (“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”) (quoting *Yankee Atomic Elec. Co.* (Yankee Nuclear Power Station), CLI-05-15, 61 NRC 365, 375 n.26 (2005)).

⁵⁵ See *Oyster Creek*, CLI-08-23, 68 NRC at 468 (2008) (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).”).

⁵⁶ *Vt. Yankee*, CLI-10-17, 72 NRC at 36.

⁵⁷ See *id.* at 33 n.185, 37.

⁵⁸ *Seabrook*, CLI-12-05, slip op. at 16 n.78.

In light of the foregoing, a finding that an applicant's AMP is consistent with NUREG-1801, Revision 1 carries special weight⁵⁹ and constitutes a finding of reasonable assurance under 10 C.F.R. §§ 54.21(a), 54.21(c)(1)(iii), and 54.29(a).⁶⁰ In November 2009, the NRC Staff issued its SER, finding Entergy's LRA to be consistent with NUREG-1801, Revision 1 and acceptable.⁶¹

2. NUREG-1801, Revision 1 Guidance on Metal Fatigue and PWSCC

NUREG-1801, Revision 1, Section X.M1, "Metal Fatigue of the Reactor Coolant Pressure Boundary," defines the necessary program attributes for an AMP that monitors and tracks the number of critical thermal and pressure transients and addresses the effects of the reactor coolant environment on fatigue life.⁶² The NRC Staff has found that, in accordance with 10 C.F.R. § 54.21(c)(1)(iii), this program is an acceptable option for managing the effects of aging due to metal fatigue for RCS pressure boundary components, considering environmental effects.⁶³

Similarly, NUREG-1801, Revision 1, Section XI.M2, "Water Chemistry," defines the program attributes for an AMP to mitigate damage caused by corrosion and stress corrosion cracking.⁶⁴ The NRC Staff has found that this program, in accordance with 10 C.F.R. § 54.21(a)(3), is an acceptable option for managing the effects of PWSCC.⁶⁵

⁵⁹ *Id.*

⁶⁰ *Vt. Yankee*, CLI-10-17, 72 NRC at 36.

⁶¹ *See* SER at 3-79 (NYS00326B).

⁶² *See* NUREG-1801, Revision 1 at X M-1 to -2 (NYS00146C).

⁶³ *Id.* at X M-1.

⁶⁴ *See id.* at XI M-10 to -13.

⁶⁵ *See id.*

3. NUREG-1801, Revision 2 Guidance on Metal Fatigue and PWSCC

In December 2010, the NRC Staff issued NUREG-1801, Revision 2. This revision was issued more than three years after the IPEC LRA was submitted, and more than a year after the NRC staff issued its original SER on the IPEC LRA in August 2009.

As explained in Entergy's Testimony,⁶⁶ NUREG-1801, Revision 2 contains three significant changes that are relevant to the issues raised in this contention. The first is a change to the NRC Staff's discussion of the critical components for EAF identified in NUREG/CR-6260. While the prior guidance focused the licensees EAF analyses on the critical components identified in NUREG/CR-6260, the new guidance in NUREG-1801, Revision 2 states that applicants should evaluate additional plant-specific component locations for EAF if they may be more limiting than those considered in NUREG-CR-6260.⁶⁷

The second change relates to the potential for PWSCC to affect nickel alloy divider plates in PWR steam generators. In the tabulations of evaluations of AMPs for recirculating steam generators, NUREG-1801, Revision 2 states that for managing potential cracking due to PWSCC in nickel alloy steam generator divider plate assemblies and associated welds, "the effectiveness of the chemistry control program should be verified to ensure that cracking due to PWSCC is not occurring."⁶⁸ As explained in the SRP-LR, Revision 2, the NRC made this change because there is foreign operating experience showing cracking due to PWSCC in the divider plate assemblies in certain steam generators similar to nickel alloy ("Alloy 600") Westinghouse steam generators. The NRC Staff stated that, although divider plate cracks may not have a significant safety impact in and of themselves, cracks could propagate to adjacent steam generator components which,

⁶⁶ See Entergy Test. at A58 (ENT000521).

⁶⁷ See NUREG-1801, Revision 2, at X M1-2 (NYS00147C).

⁶⁸ NUREG-1801, Revision 2, at IV D1-3 (NYS00147B).

unlike the divider plates, are part of the RCS pressure boundary.⁶⁹ Thus, in addition to the Water Chemistry Program, the Staff now recommends that, if steam generator materials are susceptible to cracking and crack propagation is possible, then the effectiveness of the Water Chemistry Program should be verified through additional inspections.⁷⁰ The NRC recommends that licensees undertake these inspections after the components have seen more than approximately 20 years of service, because it is unlikely that PWSCC which can be reliably detected by non-destructive examination techniques will be present before this time.⁷¹

The third change is based on a separate concern about the potential for PWSCC in steam generator nickel alloy tube-to-tubesheet welds. NRC now also recommends inspections of those components on time frame similar to that recommended for divider plates.⁷²

Entergy's Commitments 43, 41, and 42, respectively, address these recent changes to NRC guidance. Therefore, the IPEC LRA is consistent with the guidance in NUREG-1801, Revision 1 and meets the intent of Revision 2.

C. Commitments in the Part 54 License Renewal Process

Demonstrating reasonable assurance through the identification of future actions (*i.e.*, commitments) is a bedrock principle of the license renewal process in 10 C.F.R. Part 54.⁷³ Part 54 specifically authorizes licensees to demonstrate compliance with its requirements via

⁶⁹ See SRP-LR, Revision 2, at 3.1-6 (NYS000161).

⁷⁰ See *id.* at 3.1-13.

⁷¹ See Entergy Test. at A141 (ENT000521).

⁷² See *id.* at A58-59 (*citing* NRC Regulatory Issue Summary 2011-05, Information on Revision 2 to the Generic Aging Lessons Learned Report for License Renewal of Nuclear Power Plants at 5 (July 1, 2011) ("RIS 2011-05") (ENT000192)).

⁷³ 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.").

prospective actions to be taken after the NRC issues the renewed license.⁷⁴ This principle dates back to the original license renewal rule in 1991, when 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 Commission explained:

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.⁷⁵

In its 1995 revised rule, the Commission reiterated the reliance upon commitments as part of the license renewal process.⁷⁶

More recently, the Commission again affirmed these important principles in the *Vermont Yankee* license renewal proceeding in which the Commission held:

We also disagree with the Board’s conclusion that Entergy’s future-oriented interpretation would avoid the whole point of the license renewal process – to demonstrate that aging will be properly managed. Section 54.29(a) of our regulations 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. . . .” Moreover, in *Oyster Creek*, we 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

⁷⁴ 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).

⁷⁵ Final Rule: Nuclear Power Plant License Renewal, 56 Fed. Reg. 64,943, 64,946 (Dec. 13, 1991) (emphasis added).

⁷⁶ 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)).

program identified in the GALL Report [*i.e.*, NUREG-1801] constitutes reasonable assurance that it *will* manage the targeted aging effect during the renewal period.” We reiterate here that a commitment to implement an AMP that the NRC finds is consistent with the GALL Report constitutes one acceptable method for compliance with 10 C.F.R. § 54.21(c)(1)(iii).⁷⁷

Thus, the Commission has repeatedly confirmed that a fundamental aspect of the license renewal process under Part 54 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 under Section 54.29(a).

This principle is also consistent with a long line of precedent on the importance and acceptability of licensee commitments in general, including those made by license renewal applicants. 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.⁷⁸ Assuming otherwise “would transmogrify license proceedings into open-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.”⁷⁹

Importantly, the NRC Staff continuously reviews implementation activities to be performed in connection with commitments as part of its ongoing regulatory oversight process—

⁷⁷ *Vt. Yankee*, CLI-10-17, 72 NRC at 36 (*citing Oyster Creek*, CLI-08-23, 68 NRC at 468).

⁷⁸ *See, e.g., Pac. Gas & Elec. Co.* (Diablo Canyon Nuclear Power Plant, Units 1 & 2), CLI-03-2, 57 NRC 19, 29 (2003).

⁷⁹ *Hydro Res., Inc.* (P.O. Box 777, Crownpoint, NM 87313), CLI-06-1, 63 NRC 1, 5 (2006) (citation omitted).

“separate and apart” from its review of the LRA.⁸⁰ 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. Likewise, the adequacy of Entergy’s ongoing AMP implementation and commitment-fulfillment activities are also not subject to litigation in this hearing. Instead, the focus of this hearing must be on the adequacy of Entergy’s LRA, including the TLAAs, AMPs, and commitments contained therein, in comparison to the requirements of 10 C.F.R. Part 54 and the associated NRC guidance.

D. 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.⁸¹ The mere admission of a contention does not satisfy this burden.⁸² If the Intervenors do establish a *prima facie* case on a particular claim, then the burden shifts to Entergy to provide sufficient evidence to rebut the intervenor’s contention.⁸³

⁸⁰ *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.* (“review and enforcement of license conditions is a normal part of the Staff’s oversight function rather than an adjudicatory matter”).

⁸¹ *Oyster Creek*, CLI-09-7, 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).

⁸² *See Oyster Creek*, CLI-09-7, 69 NRC at 268-70.

⁸³ *See, e.g., id.* at 269; *see also* 10 C.F.R. § 2.325.

To prevail, the Applicant's position must be supported by a preponderance of the evidence.⁸⁴

IV. ARGUMENT

A. Entergy's Witnesses and Evidence

Entergy's testimony on NYS-38/RK-TC-5 is sponsored by the witnesses identified below. The testimony, opinions, and evidence presented by these Entergy witnesses are based on their 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.

1. Entergy's Witnesses

a. Mr. Nelson F. Azevedo

Nelson Azevedo's professional and educational qualifications are summarized in his *curriculum vitae*⁸⁵ and in Section I.A. of Entergy's testimony. Mr. Azevedo is employed by 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.

⁸⁴ See *Pac. Gas & Elec. Co.* (Diablo Canyon Nuclear Power Plant, Units 1 & 2), ALAB-763, 19 NRC 571, 577 (1984); *Oyster Creek*, CLI-09-7, 69 NRC at 263.

⁸⁵ See *Curriculum Vitae* for Nelson F. Azevedo (ENT000032).

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.”⁸⁶ An expert witness, however, “may qualify as an expert by knowledge, skill, experience, training, *or* education.”⁸⁷ 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.⁸⁸

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.⁸⁹ 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.⁹⁰ Allegations of bias, moreover, require substantial evidentiary support.⁹¹ 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.

⁸⁶ 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”).

⁸⁷ *Duke Energy Corp.* (Catawba Nuclear Station, Units 1 & 2), CLI-04-21, 60 NRC 21, 27 (2004) (emphasis added).

⁸⁸ *See Curriculum Vitae* of Joram Hopenfeld (“Hopenfeld CV”) (RIV000004).

⁸⁹ *See Hopenfeld Rebuttal Testimony* at 13-14 (RIV000114).

⁹⁰ *See Metropolitan 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).

⁹¹ *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP-03-8, 57 NRC 293, 341 (2003), *aff'd Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-03-8, 58 NRC 11 (2003).

b. Mr. Robert J. Dolansky

Robert Dolansky's professional and educational qualifications are summarized in his *curriculum vitae*⁹² 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*⁹³ 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 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.⁹⁴

⁹² See *Curriculum Vitae* for Robert J. Dolansky (ENT000522).

⁹³ See *Curriculum Vitae* for Alan B. Cox (ENT000031).

⁹⁴ 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.

d. Mr. Jack R. Strosnider, Jr.

Jack Strosnider's professional and educational qualifications are summarized in his *curriculum vitae*⁹⁵ 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.

e. Dr. Robert E. Nickell

Robert Nickell's professional and educational qualifications are summarized in his *curriculum vitae*⁹⁶ and in Section I.E. of Entergy's testimony. Dr. Nickell is the President and founder of an engineering consulting firm, Applied Science & Technology, which has provided specialty engineering consulting services to the industry and government for over 30 years. Dr. Nickell holds a B.S., M.S., and a Doctor of Philosophy degree, all in Engineering Science, from the University of California at Berkeley. Dr. Nickell is qualified through knowledge, skill, directly-relevant experience, training, and education to provide expert witness testimony on the commitments challenged in this contention.

⁹⁵ See *Curriculum Vitae* for Jack R. Strosnider, Jr (ENT000184).

⁹⁶ See *Curriculum Vitae* for Robert E. Nickell (ENTR00185).

Dr. Hopenfeld has stated that Dr. Nickell has “no publications in areas relating to corrosion or fatigue testing.”⁹⁷ This is incorrect—he has numerous publications on these topics.⁹⁸ Dr. Nickell is clearly qualified through “knowledge, skill, experience, training, or education”⁹⁹ to testify on the technical matters that are the subject of his testimony.¹⁰⁰

f. Mr. Mark A. Gray

Mark Gray’s professional and educational qualifications are summarized in his *curriculum vitae*¹⁰¹ and in Section I.F. 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 and a Nuclear Engineering Certificate from the University of Pittsburgh, and has over 31 years of experience in the nuclear power industry. 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 WESTEMSTM in support of the IPEC license renewal application.

⁹⁷ Hopenfeld Rebuttal Testimony at 30 (RIV000114).

⁹⁸ See generally *Curriculum Vitae* for Robert E. Nickell (ENTR00185).

⁹⁹ *Catawba*, CLI-04-21, 60 NRC at 27.

¹⁰⁰ Dr. Hopenfeld’s *curriculum vitae* shows no published papers on fatigue analysis, so Dr. Hopenfeld is unqualified by his own standards.

¹⁰¹ See *Curriculum Vitae* for Mark A. Gray (ENTR00186).

Dr. Hopenfeld claims that Mr. Gray's qualifications are deficient in the "relevant fields" of "forced and natural convection, boundary layers, and turbulence theories."¹⁰² This claim appears to be based on Dr. Hopenfeld's assumptions about Mr. Gray's undergraduate coursework over 30 years ago.¹⁰³ Mr. Gray, however, has over 30 years of directly relevant *experience* in such fields and he also holds an M.S. degree.¹⁰⁴ Dr. Hopenfeld also criticizes Mr. Gray's publications, which he suggests have not been subject to "rigorous" peer reviews.¹⁰⁵ 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."

As with Mr. Azevedo, Dr. Hopenfeld questions the impartiality of Mr. Gray's testimony.¹⁰⁶ 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.

2. Entergy's Legal Response Regarding the Enforceability of Commitments

Intervenors claim, in their Statement of Position, that Entergy's LRA "does not contain sufficient information and enforceable, binding commitments concerning the aging of certain components."¹⁰⁷ In particular, the Intervenors assert that commitments made in docketed licensing correspondence are not necessarily binding and that the NRC Staff routinely fails to

¹⁰² Hopenfeld Rebuttal Testimony at 9 (RIV000114).

¹⁰³ *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 . . .").

¹⁰⁴ *See Curriculum Vitae* for Mark A. Gray (ENTR00186).

¹⁰⁵ *See* Hopenfeld Rebuttal Testimony at 20 (RIV000114).

¹⁰⁶ *See id.* at 9, 13-14, 21.

¹⁰⁷ *See* Intervenors' Position Statement at 1 (NYS000371).

monitor and track licensee commitments.¹⁰⁸ Intervenor's claims about deficiencies in NRC's commitment review and enforcement process lack merit.

First, as previously explained, the use of commitments to demonstrate the requisite reasonable assurance for licensing purposes is a well-established, longstanding aspect of the license renewal process.¹⁰⁹ Further, Entergy is not relying upon vague commitments so it can later to define its AMPs. Entergy has *already* defined those programs with sufficient specificity.¹¹⁰

Second, the NRC's processes for the review and enforcement of licensee commitments after the issuance of a renewed license are outside the limited scope of this license renewal proceeding. The review and enforcement of license conditions is a normal part of the Staff's oversight function, not an adjudicatory matter.¹¹¹

Third, contrary to the Intervenor's assertions and as discussed further below, commitments made in an LRA are enforceable. Such commitments are tracked, monitored and inspected by both the NRC Staff and the licensees. Regardless of how a licensee's commitment is categorized, whether: (1) in a license condition; (2) in the Updated Final Safety Analysis Report Supplement ("UFSAR"); or (3) in docketed correspondence, the failure to implement a commitment can result in enforcement action.¹¹² Licensees may not alter license renewal

¹⁰⁸ See *id.* at 34-41. Intervenor also assert that "Entergy represents that statements in the NRC Staff's SER bind Entergy's future actions" and that this conflicts with NRC statements. See *id.* at 35. Intervenor do not, however, identify in their Position Statement where Entergy allegedly made such a claim, so Entergy cannot respond to this issue or clarify its prior statements without further specificity from the Intervenor.

¹⁰⁹ See *Vt. Yankee*, CLI-10-17, 72 NRC at 36; *Diablo Canyon*, CLI-03-2, 57 NRC at 29.

¹¹⁰ See Entergy Test. at A71-73, A93, A94, A115-118 (ENT000521).

¹¹¹ See *Oyster Creek*, CLI-09-7, 69 NRC at 284.

¹¹² See Entergy Test. at A79 (ENT000521); see also Letter from C. Miller, NRC, to S. Hofmann, Vermont Department of Public Service, "Response to Question in State of Vermont Letter of December 23, 2011" (Mar. 20, 2012) ("Vermont Yankee Letter") (NYS000396).

commitments without informing the NRC, and prior NRC permission is required under specified circumstances.¹¹³ Thus, Entergy disagrees with Intervenor’s argument that applicant commitments are unenforced or unenforceable.¹¹⁴

Intervenor’s focus on the phrase “legally binding,” and the term “obligations,” as those terms were used in a letter recently sent by the NRC to the State of Vermont.¹¹⁵ The Vermont Yankee Letter uses these terms to distinguish license conditions from the other two categories of commitments. Intervenor’s suggest that these terms somehow show that commitments other than license conditions are not enforceable.¹¹⁶ This is incorrect. As explained below, all three types of commitments can be the basis for enforcement action by the NRC in the event of noncompliance. The labels “legally binding” and “obligations” are simply terms used by the NRC to reflect the more stringent controls applicable to license conditions.

3. Entergy’s Evidence

In their testimony, Entergy’s experts explain why the commitments challenged by the Intervenor—together with substantial other information supporting the LRA regarding the associated AMPs—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 technical background testimony on metal

¹¹³ See Entergy Test. at A79 (ENT000521).

¹¹⁴ This fact is not undermined by Judge Karlin’s statements suggesting that commitments listed in the SER are not binding. See *In the Matter of Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc. (Vermont Yankee Nuclear Power Station) Hearing Transcript (July 23, 2008) (NYS000400)*. Judge Karlin’s comments on his own behalf during an oral proceeding are not legal authority in this proceeding. In any event, it is Entergy’s correspondence with the NRC that creates a regulatory commitment, or the incorporation of specific information into the UFSAR that creates a commitment through that document. The recitation of Entergy’s commitments by the Staff in an SER or SSER does not alter the enforceability of *Entergy’s commitments* to the NRC.

¹¹⁵ See Intervenor’s Position Statement at 36 (NYS000371) (*citing* Vermont Yankee Letter, encl. at 1-2 (NYS000396)).

¹¹⁶ See Intervenor’s Position Statement at 36 (NYS000371).

fatigue, PWSCC, and the relevant NRC regulations and guidance.¹¹⁷ The NRC's reliance on an applicant's commitments is a well established practice, one which is fully consistent with the regulations.¹¹⁸ Entergy's experts also refute the Intervenor's flawed assertions point-by-point, thereby demonstrating that the issues raised in NYS-38/RK-TC-5 and the Intervenor's associated evidentiary submissions lack merit from both a regulatory and a technical perspective.

a. **The NRC's Reliance on Applicant Commitments to Show that the Effects of Aging Will Be Adequately Managed Is Well Established and Fully Consistent with the Governing Regulations in 10 C.F.R. Part 54**

In Section VI.A of its prefiled testimony, Entergy explains that 10 C.F.R. Part 54 requires applicants to demonstrate compliance with its requirements through the identification of prospective actions to be taken in the future, after the NRC has issued the renewed license. Contrary to Intervenor's arguments¹¹⁹ and with respect to the specific challenged commitments, Entergy and the Staff are not seeking to defer the resolution of material safety issues until after the conclusion of this proceeding. Under 10 C.F.R. § 54.29, the pertinent question is whether actions have been identified and have been or *will be taken* with respect to managing age-related degradation during the PEO.¹²⁰ Contested hearings thus focus on the adequacy of an applicant's *proposed* aging management activities in light of the corresponding NUREG-1801 AMPs—not on an applicant's *implementation* of those AMPs or related commitments. The NRC Staff (not

¹¹⁷ See Entergy Test. §§ IV, V (ENT000521).

¹¹⁸ See *id.* § VI.A.

¹¹⁹ See, e.g., Lahey Test. at 10 (NYS000374).

¹²⁰ See *Turkey Point*, CLI-01-17, 54 NRC at 7; Final Rule: Nuclear Power Plant License Renewal, 56 Fed. Reg. at 64,946.

the Intervenor) reviews such implementation activities as part of its ongoing regulatory oversight—“separate and apart” from its review of the LRA.¹²¹

Indeed, prior to the PEO, the Staff conducts inspections at plants to verify that license renewal commitments and AMPs are being implemented in accordance with NRC regulations, the NRC’s SER and the UFSAR.¹²² After the renewed license is issued and the PEO begins, commitments made in the LRA are subject to NRC inspection and enforcement under 10 C.F.R. Part 50. This is no different from any other licensee commitment.¹²³

Intervenor also point to a letter from the NRC’s Director of the Division of Reactor Safety and an audit report prepared by the NRC’s Office of Inspector General (“OIG”) to suggest that licensee commitments, and in particular license renewal commitments, are not legally binding or enforceable.¹²⁴ On the contrary, the NRC has three well-established categories of commitments—whether related to license renewal or otherwise—all of which are “enforceable”:¹²⁵

1. Commitments Captured in License Conditions – When commitments are written into the renewed license, the commitment ceases to be a commitment and instead becomes a legally binding part of a license. If a licensee fails to meet this obligation, then the NRC can take enforcement action for a direct violation of its

¹²¹ *Oyster Creek*, CLI-09-7, 69 NRC at 284 (stating that “review and enforcement of license conditions is a normal part of the Staff’s oversight function rather than an adjudicatory matter”).

¹²² See *Entergy Test.* at A80-82 (ENT000521).

¹²³ See *id.* at A81.

¹²⁴ See Intervenor’s Position Statement at 35- 40 (NYS000371) (*citing* OIG-A-17, Audit of NRC’s Management of Licensee Commitments (Sept. 19, 2011) (“OIG Audit Report”) (NYS000181); Vermont Yankee Letter (NYS000396)).

¹²⁵ These three categories are also discussed in the Vermont Yankee Letter, encl. at 1 (NYS000396).

license.¹²⁶ The terms of a license condition can only be changed through a license amendment.¹²⁷ License conditions are reserved for items of high regulatory or safety significance.¹²⁸

2. Commitments Included in the UFSAR – If a licensee fails to comply with a commitment written into the UFSAR, then NRC enforcement action can take two forms. If the failure results in noncompliance with a NRC regulation, the NRC can issue a notice of violation.¹²⁹ If not, then the NRC can issue a notice of deviation.¹³⁰ Changes to commitments that have been incorporated into the UFSAR can be made by a licensee through the regulatory process defined in 10 C.F.R. § 50.59. Licensees can only change commitments in the UFSAR if they meet the criteria in Section 50.59, or, if not, through an NRC-approved license amendment. Changes that licensees make to the UFSAR under Section 50.59 are subject to NRC inspection and must be reported periodically to the NRC.¹³¹ If changes made by the licensee fail to meet the criteria in Section 50.59, then the NRC can issue a notice of violation.¹³² The NRC Staff’s current practice, as evidenced by the most recently-issued renewed license, is that all commitments

¹²⁶ See 10 C.F.R. § 2.201(a) (“In response to an alleged violation of . . . the conditions of a license . . . , the Commission may serve on the licensee or other person subject to the jurisdiction of the Commission a written notice of violation”).

¹²⁷ See 10 C.F.R. § 50.90.

¹²⁸ See NRR Office Instruction, LIC-105, Rev. 3, Managing Regulatory Commitments Made by Licensees to the NRC at 5 (Mar. 2009) (“LIC-105”) (ENT000535).

¹²⁹ See 10 C.F.R. § 2.201(a) (authorizing the issuance of notices of violation for failure to comply with the provisions of “this chapter,” *i.e.*, the NRC’s regulations in 10 C.F.R.).

¹³⁰ See NRC Enforcement Manual, Rev. 7, at 3-26 (Oct. 2010) (ENT000539).

¹³¹ See 10 C.F.R. § 50.59(d)(2). These reports are submitted on the docket and become available to the public through the NRC’s ADAMS system.

¹³² See Entergy Test. at A79 (ENT000521).

relied upon in the Staff's review will be incorporated into the UFSAR, except for commitments that have already been implemented.¹³³

3. Commitments Contained in Docketed Correspondence – These are commitments made to the NRC in writing, but which are not captured in license conditions or the UFSAR. Entergy manages these types of commitments consistent with NRC-approved guidance in NEI 99-04.¹³⁴ If a licensee fails to comply with a commitment of this type, a notice of deviation can be issued.¹³⁵ These commitments can be changed by the licensee through the licensee's administrative commitment management procedures. Changes made to license renewal commitments under the licensee's administrative process are reported to the NRC.¹³⁶ Regulatory commitments are appropriate for matters that are of significant interest to the staff, but do not warrant license conditions or inclusion in the UFSAR.¹³⁷

Thus, regardless of how or where a commitment is captured, it is tracked and subject to NRC enforcement if not properly implemented or changed in accordance with the appropriate process.¹³⁸

¹³³ See Entergy Test. at A84 (ENT000521) (*citing* Letter from A. Cunanan, NRC, to M. Reddemann, Energy Northwest, "Issuance of Renewed Facility Operating License No. NPF-21 for Columbia Generating Station" encl. at 8 (May 22, 2012) (ENT000572)).

¹³⁴ See NEI 99-04, Guidelines for Managing NRC Commitment Changes (July 1999) ("NEI 99-04") (ENT000534).

¹³⁵ See Entergy Test. at A79 (ENT000521).

¹³⁶ See NEI 99-04 at 9-10 (ENT000534).

¹³⁷ See LIC-105 at 4 (ENT000535).

¹³⁸ See Entergy Test. at A80 (ENT000521).

Intervenors also claim that the OIG Audit Report states that licensee commitments are unreliable because they are poorly tracked by the NRC Staff.¹³⁹ This argument challenges the NRC's ongoing Part 50 regulatory process rather than the adequacy of Entergy's LRA under Part 54. As noted above, the 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.¹⁴⁰ Moreover, the license renewal process is premised on the assumption that the NRC Staff will adequately perform its oversight functions.¹⁴¹ Thus, challenges to the Staff's regulatory oversight activities are outside the scope of this proceeding.¹⁴²

Beyond these threshold deficiencies, Intervenors' claims regarding the OIG Audit Report are also factually incorrect and neglect more recent information. The OIG Audit Report did not conclude that commitments were "poorly tracked" by the NRC Staff. On the contrary, the report merely recommends that the Staff should 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.¹⁴³ Since the issuance of the OIG Audit Report, the Staff has taken affirmative steps towards resolving the OIG's concerns.¹⁴⁴ The Staff has resolved all of the issues identified in the OIG Audit Report.¹⁴⁵

¹³⁹ See Intervenors' Position Statement at 40-41 (NYS000371).

¹⁴⁰ See *Oyster Creek*, CLI-09-7, 69 NRC at 284.

¹⁴¹ See *Turkey Point*, CLI-01-17, 54 NRC at 9.

¹⁴² See *Oyster Creek*, 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"); Changes to Adjudicatory Process, Final Rule, 69 Fed. Reg. 2,182, 2,202 (Jan. 14, 2004) ("the hearing process is directed at resolving issues identified and conceptualized by an interested member of the public, not at supervising the NRC staff's independent safety review").

¹⁴³ See Entergy Test. at A86 (ENT000521).

¹⁴⁴ See *id.* at A86-87.

¹⁴⁵ See *id.* at A87.

Thus, license renewal commitments are tracked by licensees and compliance with and implementation of commitments is verified by the NRC Staff prior to and during the PEO.¹⁴⁶

b. Commitment 43 – Review of Design Basis Fatigue Evaluations

In Section VI.B of its prefiled testimony, Entergy demonstrates that its commitment to review the IPEC design basis ASME Code fatigue evaluations prior to the PEO is sufficiently specific to satisfy 10 C.F.R § 54.21(a)(3) and (c)(1)(iii). Entergy further refutes Dr. Lahey’s and Dr. Hopenfeld’s critiques of the EAF analyses in detail, showing that they lack merit.

First, Dr. Hopenfeld alleges that Entergy failed to identify the most limiting locations for its revised EAF analyses, and has only now articulated a plan to determine those locations at some point before the commencement of the PEO.¹⁴⁷ Moreover, he argues that the plan Entergy has articulated is vague and fails to describe the “methodology to be used to select such [limiting] locations” for fatigue.¹⁴⁸ Dr. Lahey similarly suggests that the assumptions and criteria to be used in any subsequent EAF analysis of potentially-limiting locations are “left for consideration at a later day.”¹⁴⁹

Second, Dr. Hopenfeld and Dr. Lahey both criticize Entergy’s Commitment 43 as failing to provide results in time to be tested at a hearing. Dr. Lahey asserts that the results of that review must be “tested and resolved in these ASLB hearings.”¹⁵⁰ Likewise, Dr. Hopenfeld states that “it was not appropriate for the NRC Staff to accept Entergy’s vague commitment to

¹⁴⁶ See *id.* § VI.A.

¹⁴⁷ See Hopenfeld Test. at 11 (RIV000102); see also Lahey Test. at 29 (NYS000374).

¹⁴⁸ Hopenfeld Test. at 12 (RIV000102).

¹⁴⁹ See Lahey Test. at 30 (NYS000374).

¹⁵⁰ Lahey Test. at 30 (NYS000374).

determine at some point in the future what additional locations must be analyzed.”¹⁵¹ Finally, the Intervenor contends that Entergy’s review is too narrow, because it does not include a “comprehensive consideration of the fatigue of important [reactor pressure vessel] internal structures, components and fittings.”¹⁵² For example, Dr. Hopenfeld presents a table showing what he believes to be the locations that Entergy must consider in evaluating potential limiting locations.¹⁵³

Because EAF analyses are not TLAAAs, but are instead calculations performed as part of the FMP, the completion of such analyses is not a prerequisite to the NRC’s approval of license renewal and is not required to be completed in advance of any hearing on the adequacy of the LRA.¹⁵⁴ The Intervenor seeks to require Entergy to *complete* all final EAF evaluations now, as a condition precedent to license renewal.¹⁵⁵ But the *Vermont Yankee* decision forecloses that claim, holding that the “regulations contain no requirement that an applicant complete a subsection (iii) fatigue analysis prior to the issuance of a renewed license” if that applicant has, like Entergy here, made a commitment to implement an AMP that the NRC found to be consistent with NUREG-1801.¹⁵⁶ Thus, the Commission has held that an EAF analysis is an AMP implementation activity, which need not be completed in order to define an adequate AMP prior to a decision on license renewal.¹⁵⁷ This is particularly true where, as here, the fatigue

¹⁵¹ Hopenfeld Test. 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).

¹⁵² Lahey Test. at 30 (NYS000374).

¹⁵³ *See* Hopenfeld Test. at 14-15 (RIV000102).

¹⁵⁴ *See* Entergy Test. at A103 (ENT000521); *Vt. Yankee*, CLI-10-17, 72 NRC at 18-20, 34 (“Because CUF[en]s are not contained in Vermont Yankee’s current licensing basis, they cannot be TLAAAs and thereby a prerequisite to license renewal”).

¹⁵⁵ *See* Lahey Test. at 29-30, 32 (NYS000374); Hopenfeld Test. at 11 (RIV000102).

¹⁵⁶ *Vt. Yankee*, CLI-10-17, 74 NRC at 36.

¹⁵⁷ *See id.*

analysis methodology that Entergy intends to use as part of its AMP is being litigated in a contested hearing on a different contention, NYS-26B/RK-TC-1B. Following the resolution of that contention, there will be no need to relitigate the same criticisms of subsequent fatigue analyses at another hearing.¹⁵⁸

Furthermore, Intervenor's claims regarding the alleged vagueness of the contention are unfounded. Commitment 43 is quite specific as to the methods that will be used in the design basis fatigue calculation review, the component locations it will review, and when the analyses will be completed.¹⁵⁹ Entergy will conduct its analysis using the assumptions, criteria and processes specified in the IPEC FMP, the ASME Code and NRC-approved NUREGs (*i.e.*, NUREG/CR-6583, NUREG/CR-5704, and NUREG/CR-6909).¹⁶⁰ Entergy will evaluate all of the components discussed in LRA Section 4.3 and listed in LRA Tables 4.3-3 through 4.3-12; those components include locations for the reactor vessel, reactor vessel internals, pressurizer, steam generators, reactor coolant pumps, and control rod drive mechanisms, Class 1 heat exchangers, and Class 1 piping and components.¹⁶¹ The analysis will be completed prior to the PEO for each plant.¹⁶² This is fully consistent with the scope of the FMP, which is intended to manage the effects of metal fatigue for components with CLB CUFs that are addressed as TLAAs under 10 C.F.R. § 54.21(c)(i)(iii).¹⁶³

¹⁵⁸ See *id.* at 45; see also *id.* at 53-54 (approving the Board's direction that contentions challenging new fatigue analyses should not "rehash old arguments" previously resolved in the proceeding).

¹⁵⁹ See Entergy Test. at A95-97, A100-102 (ENT000521).

¹⁶⁰ See *id.* at A101.

¹⁶¹ See *id.* at A100.

¹⁶² See *id.* at A94 (*citing* NL-11-032, Attach. 1, at 26 (NYS000151)).

¹⁶³ See *Vt. Yankee*, CLI-10-17, 72 NRC at 36; NUREG-1801, Revision 1 at X M-1 (NYS00146C).

Commitment 43 is not currently incorporated into the UFSAR supplement in Appendix A of the IPEC LRA, but current practice and precedent indicate that the NRC will add this commitment to the UFSAR in the renewed license. Commitment 43 addresses an issue that is not of high regulatory or safety significance, so a license condition would not be appropriate.¹⁶⁴

In summary, Commitment 43 is consistent with NUREG-1801, Revision 1 and meets the intent of NUREG-1801, Revision 2, because Entergy has clearly defined the locations, methods, and timing for the additional evaluations. Thus, Entergy's Commitment 43 supports the NRC Staff's finding of reasonable assurance that the FMP will manage the effects of aging during the PEO.

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

Section VI.C of Entergy's prefiled testimony addresses Dr. Lahey's and Dr. Hopenfeld's critique of Commitment 44, which addresses the use of "user intervention" in the analyses conducted using the WESTEMS™ software. Dr. Lahey challenges "numerous assumptions" that are made regarding WESTEMS™ inputs, and the use of "user intervention" in conducting fatigue evaluations.¹⁶⁵ Dr. Lahey also argues that the Westinghouse EAF analyses are "strongly influenced" by user "assumptions [and] manipulations" and are, therefore, untrustworthy.¹⁶⁶ Dr. Hopenfeld similarly argues that the commitment is 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."¹⁶⁷

¹⁶⁴ See Entergy Test. at A97 (ENT000521).

¹⁶⁵ Lahey Test. at 24-25 (NYS000374).

¹⁶⁶ Lahey Test. at 27 (NYS00374).

¹⁶⁷ Hopenfeld Test. at 15-16 (RIV000102).

These claims lack merit because the contention is based on an incorrect understanding of the term “user intervention.”¹⁶⁸ Dr. Lahey defines “user intervention” as “the use of assumptions and engineering judgment in the process of calculating the CUF_{en} values using codes such as WESTEMS.”¹⁶⁹ “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 WESTEMSTM at a specific stage in the fatigue evaluation process.¹⁷⁰ Dr. Lahey’s misguided definition is overbroad and simply inapplicable to Commitment 44. Based on this over-broad and inapplicable definition, however, Dr. Lahey *assumes* that the previously-completed Westinghouse EAF analyses contain unspecified, undisclosed assumptions. This is not true. The voluminous supporting documentation for the completed Westinghouse EAF evaluations—described in considerable detail throughout Entergy’s Metal Fatigue Testimony—provides those assumptions.¹⁷¹

As to the actual issue of peak editing, which is the subject of Commitment 44, Westinghouse did not undertake “user intervention” in the IPEC EAF evaluations that have been completed to date.¹⁷² Entergy’s Commitment 44 now specifically provides for the documentation of “user intervention” in the future. If peak editing is used, it will be conducted by qualified analysts, and will be conducted consistent with standard ASME Code methods.¹⁷³ Furthermore, stress peak and valley selections will be independently reviewed by another

¹⁶⁸ See Entergy Test. at A124 (ENT000521).

¹⁶⁹ Lahey Test. at 24 (NYS000374).

¹⁷⁰ See Entergy Test. at A116 (ENT000521).

¹⁷¹ See *id.* at A124; *see also generally* Testimony of Entergy Witnesses Nelson F. Azevedo, Alan B. Cox, Jack R. Strosnider, Robert E. Nickell, and Mark A. Gray (Mar. 29, 2012) (“Entergy’s Metal Fatigue Testimony”) (ENT000183).

¹⁷² See *id.* at A119.

¹⁷³ See *id.* at A121.

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.

Contrary to Intervenor's previous accusations that Entergy plans "to deviate from WESTEMS™ under certain, undisclosed circumstances, when it fits Entergy's convenience,"¹⁷⁴ 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. Such an action would violate NRC regulations and quality assurance procedures mandated by those regulations. Further, such statements¹⁷⁵ appear to reflect the biases of the Intervenor's and the witness, 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.

Commitment 44 is not currently incorporated into the UFSAR supplement in Appendix A of the IPEC LRA, but current practice and precedent indicate that the NRC will add this commitment to the UFSAR in the renewed license. Commitment 44 addresses an issue that is not of high regulatory or safety significance, so a license condition would not be appropriate.¹⁷⁶

¹⁷⁴ Contention NYS-38/RK-TC-5 at 9.

¹⁷⁵ See Lahey Test. at 24-25, 27 (NYS000374).

¹⁷⁶ See Entergy Test. at A122 (ENT000521).

d. Commitments 41 and 42 – Steam Generator Inspections

In Section VI.D of its prefiled testimony, Entergy’s witnesses address Dr. Lahey’s and Dr. Duquette’s critique of Commitments 41 and 42, which address analyses and inspections to identify the effects of PWSCC, if any, on certain steam generator components.¹⁷⁷

Dr. Lahey criticizes Commitment 41 as vague, in 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.¹⁷⁸ Dr. Duquette provides similar criticisms,¹⁷⁹ while adding that there is a lack of “monitoring and trending protocols.”¹⁸⁰ Intervenors also challenge the timing of Entergy’s inspections under Commitment 41, further stating that the “details of the inspections for [PWSCC] in the steam generator’s divider plates will apparently not be available until after extended operations are expected to begin.”¹⁸¹

With respect to timing, the NRC recommends that licensees undertake steam generator divider plate inspections after the components have experienced more than approximately 20 years of service, because it is unlikely that PWSCC that can be reliably detected by non-destructive examination techniques will be present before this time.¹⁸² This is consistent with information from foreign operating experience, which shows that approximately 20 years of

¹⁷⁷ See Entergy Test. § VI.D.

¹⁷⁸ See Lahey Test. at 21 (NYS000374).

¹⁷⁹ See Duquette Test. at 27-28 (NYS000372).

¹⁸⁰ *Id.* at 28 (NYS000372).

¹⁸¹ Lahey Test. at 10-11 (NYS000374); *see also* Duquette Test. at 10, 26 (NYS000372); Duquette Report at 19, 21, 22 (NYS000373).

¹⁸² See Entergy Test. at A141 (ENT000521) (*citing* Letter from J. Daily, NRC, to D. Heacock, President, Dominion Energy Kewaunee, Inc., “Request for Additional Information for the Review of the Kewaunee Power Station License Renewal Application (TAC No. MD9408),” encl. at 3 (Sept. 10, 2010) (ENT000558); NUREG-1961, at 3-158 (ENT000537)).

service time had accumulated before PWSCC was detected.¹⁸³ Notably, NYS's witness, Dr. Duquette, appears to agree that this timing is appropriate.¹⁸⁴

Commitment 41 specifies that the technique used will be capable of detecting PWSCC in divider plates. Contrary to Intervenor's claims,¹⁸⁵ qualified inspection techniques for detecting PWSCC already exist.¹⁸⁶ This method, however, has the potential to expose inspection personnel to relatively high radiation doses.¹⁸⁷ As such, along with EPRI and the rest of the industry, Entergy is pursuing an alternative method, such as an eddy current surface examination from the inside of the steam generator tubes. Remote techniques with lower associated doses are available overseas and there are no significant impediments to prevent a U. S. plant from using similar or identical methodologies for the detection of any PWSCC in domestic steam generator divider plates.¹⁸⁸ Although Dr. Duquette states that EPRI has "admitted that there are still no qualified techniques" in the U.S.,¹⁸⁹ this is merely a reflection of the fact that the need to develop specifically-qualified techniques in the U.S. has not yet arisen.¹⁹⁰ Thus, Entergy is not relying on the future completion of EPRI research to define its actions under Commitment 41.

¹⁸³ See Entergy Test. at A65 (ENT000521) (*citing* EPRI Presentation, Steam Generator Task Force/Nuclear Regulatory Commission Biannual Meeting at 6 (Feb. 16, 2012) (NYS000392)).

¹⁸⁴ See Duquette Report at 17-18 (NYS000373) (noting these inspection timing criteria are applied to LRAs reviewed under NUREG-1801, Revision 2 and suggesting that they should be applied to IPEC).

¹⁸⁵ See Lahey Test. at 10-11 (NYS000374) ("The details of the inspections for primary water stress corrosion cracking (PWSCC) in the steam generator's divider plates will apparently not be available until after extended operations are expected to begin."); Duquette Test. at 28 (NYS000372) ("Entergy has not proposed a specific inspection procedure").

¹⁸⁶ See Entergy Test. at A70-71, A150 (ENT000521).

¹⁸⁷ See *id.* at A49.

¹⁸⁸ See *id.*

¹⁸⁹ Duquette Report at 16 (NYS000373).

¹⁹⁰ See Entergy Test. at A164 (ENT000521).

In any event, the NRC's review of pending LRAs cannot be placed on hold indefinitely because of the need to research a specific issue that might require additional aging management activities in the future. If that were so, then the NRC would only be able to issue renewed operating licenses at a point in time when there are no generic issues that are the subject of ongoing research or investigation to develop or improve aging management activities. That, of course, has never been the case.¹⁹¹

Dr. Lahey and Dr. Duquette also criticize Entergy's plans to address the issue of potential cracking due to PWSCC of tube-to-tubesheet welds.¹⁹² Entergy believes that Intervenor's challenges to the adequacy of Commitment 42, which provides for future analyses or inspections of steam generator tube-to-tubesheet welds, are outside the scope of this contention.¹⁹³

Without waiving its arguments regarding the scope of the admitted contention, Entergy's witnesses show that there is no requirement that actual inspections be completed before license renewal.¹⁹⁴ Commitment 42 specifies that Entergy will address the NRC Staff's concern through one of two options, either an analysis or inspection.¹⁹⁵ Under the analysis option, Entergy would evaluate the tube-to-tubesheet welds in order to establish a technical basis for either determining

¹⁹¹ See, e.g., Entergy Test. at A89 (ENT000521) (discussing the NRC's approval of numerous license renewal applications based on applicant commitments to follow yet-to-be-developed industry guidance on reactor vessel internals aging management).

¹⁹² See Lahey Test. at 11 (NYS000374); Duquette Test. at 10 (NYS000372).

¹⁹³ See generally Entergy's Motion in Limine for NYS-38/RK-TC-5 (denied Aug. 16, 2012).

¹⁹⁴ The Board in this proceeding confirmed this point in rejecting the State's contention NYS-23, which argued that Entergy must conduct across-the-board "baseline" inspections prior to the PEO. See *Indian Point*, LBP-08-13, 68 NRC at 126. In addition, the imposition of across-the-board inspections prior to the PEO without a specific technical basis is also foreclosed because the regulations in 10 C.F.R. Part 54 do not require the applicant to demonstrate that aging effects will be precluded, but only that such effects will be adequately managed. See *Seabrook*, CLI-12-05, slip op. at 3, 18.

¹⁹⁵ Entergy Test at A142 (ENT000521).

that these welds are not susceptible to PWSCC, or that PWSCC in these welds would not impact the structural integrity of the RCS pressure boundary.¹⁹⁶

If the analysis results are not acceptable, then under the second option Entergy would perform a one-time inspection of a representative number of welds in each steam generator and, if cracking is identified, the condition will be resolved through repair, or an engineering evaluation and an ongoing monitoring program will be established for the life of the steam generators.¹⁹⁷ At IP2, the inspections would take place between March 2020 and March 2024, or between 20 and 24 years of service; at IP3, the inspections would take place by the end of the first refueling outage during the PEO.¹⁹⁸ As is the case for the divider plate inspections, ASME Code qualified inspection methods for detecting PWSCC in these components already exist. The only issue with respect to the application of this inspection methodology in this situation would be the potential for relatively high personnel radiation exposure.¹⁹⁹ For this reason, Entergy and the industry are exploring the use of an eddy current surface examination from the inside of the steam generator tubes, in accordance with ASME Code Section XI, IWA-2223.²⁰⁰ Thus, Entergy will manage the effects of aging due to PWSCC in tube-to-tubesheet welds either by demonstrating that those welds are not susceptible to PWSCC, or by implementing a one-time inspection on a representative number of welds.

Commitments 41 and 42 are not currently incorporated into the UFSAR supplement in Appendix A of the IPEC LRA, but current practice and precedent indicate that the NRC will add

¹⁹⁶ *See id.*

¹⁹⁷ *See id.* at A145.

¹⁹⁸ *See id.* at A144.

¹⁹⁹ *See id.* at A145.

²⁰⁰ *See id.*

these commitments to the UFSAR in the renewed license. The commitments address an issue that is not of high regulatory or safety significance, so a license condition would not be appropriate.²⁰¹

Therefore, Commitments 41 and 42 reinforce the conclusion that the effects of PWSCC will be adequately managed such that affected components will remain capable of performing their intended function throughout the PEO, consistent with 10 C.F.R. §§ 54.21(a)(3), 54.21(c)(1)(iii) and 54.29(a).

²⁰¹ See *id.* at A147.

V. CONCLUSION

For the foregoing reasons, Entergy's commitments—together with the other aging management activities specified in the LRA—provide reasonable assurance that the effects of aging will be adequately managed throughout the PEO. The Intervenor has 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.

Respectfully submitted,

Signed (electronically) by Raphael P. Kuyler

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