

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Lawrence G. McDade, Chairman  
Dr. Kaye D. Lathrop  
Dr. Richard E. Wardwell

In the Matter of

ENTERGY NUCLEAR OPERATIONS, INC.

(Indian Point Nuclear Generating Units 2 and 3)

Docket Nos. 50-0247-LR and 50-286-LR

ASLBP No. 07-858-03-LR-BD01

November 4, 2010

MEMORANDUM AND ORDER

(Ruling on Motion for Summary Disposition of NYS-26/26A/Riverkeeper TC-1/1A (Metal Fatigue of Reactor Components) and Motion for Leave to File New Contention NYS-26B/Riverkeeper TC-1B)

On August 9, 2010, Entergy Nuclear Operations, Inc. (hereinafter Entergy or the Applicant) submitted the results of its refined analyses of environmentally assisted metal fatigue to the NRC Staff.<sup>1</sup> Before the Board are (1) a motion filed by Entergy on August 25, 2010, for summary disposition of Contention NYS-26/26A and Riverkeeper TC-1/1A (hereinafter NYS-26/26A/RK-TC-1/1A) due to these reanalyses<sup>2</sup> and (2) a motion filed on September 9, 2010 by Intervenors the State of New York (hereinafter New York) and Riverkeeper, Inc. (hereinafter Riverkeeper) for leave to file new and amended Contention NYS-26B/RK-TC1B (hereinafter NYS-26B/RK-TC-1B), which is based on these reanalyses and relates to Entergy's plans for

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<sup>1</sup> See Letter from Fred Dacimo, Entergy Nuclear Northeast, to U.S. Nuclear Regulatory Commission, NL-10-082 (Aug. 9, 2010) (ADAMS Accession No. ML102300504) [hereinafter NL-10-082]; see also Letter from Kathryn M. Sutton and Paul M. Bessette, Counsel for Entergy Nuclear Operations, Inc., to Atomic Safety and Licensing Board (Aug. 10, 2010) (ADAMS Accession No. ML102310325).

<sup>2</sup> Applicant's Motion for Summary Disposition of New York State Contentions 26/26A & Riverkeeper Technical Contentions 1/1A (Metal Fatigue of Reactor Components) (Aug. 25, 2010) at 1-2, 14-15 [hereinafter Entergy Motion for Summary Disposition].

managing the effects of metal fatigue during its proposed period of extended operation (PEO).<sup>3</sup> On September 14, 2010, New York and Riverkeeper responded in opposition to Entergy's Motion for Summary Disposition,<sup>4</sup> and the NRC Staff responded in support of Entergy's Motion.<sup>5</sup> On October 4, 2010, Entergy<sup>6</sup> and the NRC Staff<sup>7</sup> filed answers opposing admission of New York's and Riverkeeper's new contention. New York and Riverkeeper filed a Reply on October 12, 2010.<sup>8</sup>

For the reasons explained below, the Board admits NYS-26B/RK-TC-1B. The Board also denies Entergy's Motion for Summary Disposition of NYS-26/26A/RK-TC-1/1A as moot and dismisses NYS-26/26A/RK-TC-1/1A as moot because both the previously-admitted consolidated contention and the Motion for Summary Disposition have been superseded by Entergy's August 2010 reanalyses and the challenges to those reanalyses found in NYS-26B/RK-TC-1B.

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<sup>3</sup> State of New York's and Riverkeeper's Motion for Leave to File a New and Amended Contention Concerning the August 9, 2010 Entergy Reanalysis of Metal Fatigue (Sept. 9, 2010) at 1-2 [hereinafter New York and Riverkeeper Motion].

<sup>4</sup> State of New York and Riverkeeper, Inc. Combined Response to Entergy Motion for Summary Disposition of Combined Contentions NYS 26/26A and RK TC-1/TC1-A (Metal Fatigue) (Sept. 14, 2010) at 6-17 [hereinafter New York and Riverkeeper Response to Entergy Motion].

<sup>5</sup> NRC Staff's Answer to Applicant's Motion for Summary Disposition of New York Contention 26/26A and Riverkeeper Contention TC-1/1A -- Metal Fatigue (Sept. 14, 2010) at 1-2 [hereinafter NRC Staff Answer to Entergy Motion].

<sup>6</sup> Applicant's Answer to New and Amended Contention New York State 26B/Riverkeeper TC-1B (Metal Fatigue) (Oct. 4, 2010) at 1-2 [hereinafter Entergy Answer to New York and Riverkeeper Motion].

<sup>7</sup> NRC Staff's Answer to State of New York's and Riverkeeper's Motion for Leave to File a New and Amended Contention Concerning the August 9, 2010 Entergy Reanalysis of Metal Fatigue (New York State 26-B/Riverkeeper TC-1B (Metal Fatigue)) (Oct. 4, 2010) at 1-2 [hereinafter NRC Staff Answer to New York and Riverkeeper Motion].

<sup>8</sup> State of New York and Riverkeeper, Inc.'s Joint Reply to Entergy and NRC Staff's Separate Answers to the State and Riverkeeper's New and Amended Contention New York State 26B/Riverkeeper TC-1B (Metal Fatigue) (Oct. 12, 2010) [hereinafter New York and Riverkeeper Reply].

I. New York's and Riverkeeper's Amended and New Contention NYS-26B/RK-TC-1B

A. Legal Standards Governing Contention Admissibility

As we have summarized before, timely filed new and amended contentions must meet the requirements of 10 C.F.R. § 2.309(f)(2)(i)-(iii), in addition to the general contention admissibility requirements of 10 C.F.R. § 2.309(f)(1)(i)-(vi).<sup>9</sup> Further, in accordance with the Scheduling Order issued in this proceeding, this Board has specified that new or amended contentions would satisfy Section 2.309(f)(2)(i)-(iii) and thus be timely filed if submitted within "thirty . . . days of the date when the new and material information on which it is based first becomes available."<sup>10</sup>

B. Legal Standards Governing Metal Fatigue Analyses in the NRC's License Renewal Regime and the History of Entergy's Metal Fatigue Analyses for Indian Point

As noted by the Commission in its recent ruling in Vermont Yankee, a license renewal applicant satisfies the NRC's regulation dealing with aging management (i.e., 10 C.F.R. § 54.21) by one of three ways: (1) relying on 10 C.F.R. § 54.21(c)(1)(i) (hereinafter Section 54.21(c)(1)(i) or Subsection (i)) by demonstrating that its existing Time-Limited Aging Analysis (TLAA) under its current licensing basis (CLB) is valid for the twenty-year PEO, (2) relying on 10 C.F.R. § 54.21(c)(1)(ii) (hereinafter Section 54.21(c)(1)(ii) or Subsection (ii)) by showing that an existing TLAA has been projected to remain valid through the end of that PEO, or (3) relying on 10 C.F.R. § 54.21(c)(1)(iii) (hereinafter Section 54.21(c)(1)(iii) or Subsection (iii)) by establishing an Aging Management Plan (AMP) (or a similar plan).<sup>11</sup> If an applicant cannot or chooses not to justify or extend existing TLAAs through the PEO in accordance with Subsections (i) and (ii), it

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<sup>9</sup> See LBP-10-13, 71 NRC \_\_, \_\_ (slip op. at 2-3) (June 30, 2010); see also Licensing Board Order (Ruling on New York State's New and Amended Contentions) (June 16, 2009) at 2 (unpublished); LBP-08-13, 68 NRC 43, 60-64 (2008).

<sup>10</sup> Licensing Board Scheduling Order (July 1, 2010) at 6 (unpublished).

<sup>11</sup> Entergy Nuclear Vermont Yankee, L.L.C., & Entergy Nuclear Operations, Inc. (Vermont Yankee Nuclear Power Station), CLI-10-17, 72 NRC \_\_, \_\_ (slip op. at 20-22) (July 8, 2010).

must demonstrate under Subsection (iii) that it can adequately manage the effects of aging for the PEO.<sup>12</sup>

While initially proposing in its License Renewal Application (LRA) to meet the aging regulations for metal fatigue either through Subsection (i) or Subsection (iii),<sup>13</sup> Entergy clarified in Amendment 2 to its LRA that it is demonstrating aging management through the implementation of a plan in accordance with Section 54.21(c)(1)(iii) and using its existing Fatigue Monitoring Program (FMP) as its AMP.<sup>14</sup> The description of the FMP provided in LRA Section A.2.1.11 (as modified by Amendment 2 to Entergy's LRA) states that the program will track cumulative usage factors (CUFs) during the PEO by updating these calculations and implementing corrective actions before CUFs exceed 1.0, in accordance with Entergy's quality assurance and corrective action programs for the Indian Point Energy Center (IPEC).<sup>15</sup>

Appendix B to the LRA also includes a brief description of the FMP, stating that:

The Fatigue Monitoring Program is an existing program that tracks the number of critical thermal and pressure transients for selected reactor coolant system components. The program ensures the validity of analyses that explicitly analyzed a specified number of fatigue transients by assuring that the actual effective number of transients does not exceed the analyzed number of transients.<sup>16</sup>

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<sup>12</sup> Id. at \_\_ (slip op. at 20-21).

<sup>13</sup> Indian Point Energy Center, License Renewal Application, Technical Information, Section 4: Time-Limited Aging Analyses (Apr. 30, 2007) at 4.1-3 to 4.1-6 (ADAMS Accession No. ML071210517) [hereinafter LRA].

<sup>14</sup> Letter from Fred Dacimo, Entergy Nuclear Northeast, to U.S. Nuclear Regulatory Commission, NL-08-021 (Jan. 22, 2008), Attach. 1, Fatigue Monitoring Program Clarification at 1-6 (ADAMS Accession No. ML080290659) [hereinafter NL-08-021]; id., Attach. 2, Regulatory Commitment List, Rev. 3 at 15; LRA at 4.3-2 to 4.3-3.

<sup>15</sup> LRA, Updated Final Safety Analysis Report Supplement, App. A (Apr. 30, 2007) § A.2.1.11 (ADAMS Accession No. ML071210520) [hereinafter LRA, App. A]; NL-08-021, Attach. 1, Fatigue Monitoring Program Clarification at 2.

<sup>16</sup> LRA, Aging Management Programs and Activities, App. B (Apr. 30, 2007) at B-44 to -46 (ADAMS Accession No. ML071210523) [hereinafter LRA, App. B] (emphasis added).

With Entergy's stated position that it has addressed Section 54.21(c)(1)(iii) through use of an AMP, by definition, the CUFs calculated by Entergy have been presented in support of its program to manage aging rather than to demonstrate that the TLAAs are valid for (pursuant to Subsection (i)) or projected through (pursuant to Subsection (ii)) the PEO. Amendment 2 added, inter alia, Commitment #33 (addressing aging management for metal fatigue) to what was previously delineated in Entergy's existing FMP. Under Commitment #33, Entergy has proposed that IPEC will either: (1) refine the fatigue analysis to verify that CUFs are less than 1.0, or (2) "repair or replace the affected locations before" CUFs exceed 1.0.<sup>17</sup>

In its LRA, Entergy addressed the effects of reactor water environment by including environmentally-adjusted factors (EAFs, i.e., the "F<sub>en</sub>" portion of CUF<sub>en</sub> analyses)<sup>18</sup>—a practice initially recommended by the NRC Staff<sup>19</sup> and ultimately incorporated into the NRC Staff's Standard Review Plan (SRP) in 2005.<sup>20</sup>

This practice continued for the recently submitted "refined" analyses for IPEC submitted by Entergy in 2010 which, consistent with the original calculations in its LRA, included the effects of reactor environment.<sup>21</sup> While the opposing parties challenge the breadth, accuracy,

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<sup>17</sup> NL-08-021, Attach. 1, Fatigue Monitoring Program Clarification at 1-2.

<sup>18</sup> See LRA § 4.3.3.

<sup>19</sup> Closeout of Generic Safety Issue 190, Fatigue Evaluation of Metal Components for 60-Year Plant Life (Dec. 26, 2009) at 1 (ADAMS Accession No. ML003673136) [hereinafter GSI-190 Closeout Memorandum].

<sup>20</sup> Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants, NUREG-1800, Rev. 1 (Sept. 2005) § 4.3.1.2 (ADAMS Accession No. ML052770566) [hereinafter SRP].

<sup>21</sup> See NL-10-082, Attach. 1, Environmental Fatigue Evaluations at 1. Because Entergy has always included the EAF in its CUF calculations, for simplicity, the abbreviation "CUF" will be used in this Memorandum and Order to represent these CUF<sub>en</sub> analyses, except where the generic relationship between CUF<sub>en</sub> analyses and TLAAs are discussed. See LRA § 4.3.3.

and reliability of the calculations,<sup>22</sup> Entergy reported that all of the refined predictive CUF values are less than 1.0 and it believed that it has met its obligations as stated in Commitment #33.<sup>23</sup>

C. New York State's and Riverkeeper's Contentions

1. Original Consolidated Contention (NYS-26/26A/RK-TC-1/1A)

New York State's and Riverkeeper's original consolidated contention for metal fatigue, NYS-26/26A/RK-TC1/1A, was stated as follows:

Entergy's License Renewal Application does not include an adequate plan to monitor and manage the effects of aging due to metal fatigue on key reactor components.<sup>24</sup>

The Intervenor went on to present several bases alleging how Entergy has failed to satisfy the requirements of Section 54.21(c)(1).<sup>25</sup> There was no indication that the bases stated in this consolidated contention represented the entirety of the objections to Entergy's AMP for metal fatigue, nor do the regulations require a petitioner to submit all possible bases at the contention admissibility juncture of the proceeding, as long as all are within the scope of what is admitted by the Board.<sup>26</sup>

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<sup>22</sup> See New York and Riverkeeper Motion at 1-7; New York and Riverkeeper Reply at 3-4.

<sup>23</sup> NL-10-082, Attach. 1, Environmental Fatigue Evaluations at 2-4. All CUFs are reportedly below 0.9, except the two CUFs related to RHR Class I piping for IP2 and IP3, which are 0.9434 and 0.9961, respectively. Id. at 2-3.

<sup>24</sup> Consolidated Contention of Petitioners State of New York (No. 26/26A) and Riverkeeper, Inc. (TC-1/TC1-A) – Metal Fatigue and Designation of the State of New York as Lead Litigator for this Consolidated Contention (Aug. 21, 2008) at 3 (ADAMS Accession No. ML082400524) [hereinafter Consolidated Contention NYS-26/26A/RK-TC-1/1A]; see also LBP-08-13, 68 NRC at 137-40, 172. Because the Board received no objection to the phrasing of that consolidated contention from any of the parties, the Board accepts this statement as the most recent iteration of that consolidated contention.

<sup>25</sup> Consolidated Contention NYS-26/26A/RK-TC-1/1A at 4-17.

<sup>26</sup> Entergy Nuclear Generation Co. & Entergy Nuclear Operations, Inc. (Pilgrim Nuclear Power Station, CLI-10-11, 71 NRC \_\_, \_\_ (slip op. at 28) (Mar. 26, 2010) ("Where warranted we allow for amendment of admitted contentions, but do not allow distinctly new complaints to be added at will as litigation progresses, stretching the scope of admitted contentions beyond their reasonably inferred bounds.") (internal citations omitted); Louisiana Energy Services, L.P. (National Enrichment Facility), CLI-04-35, 60 NRC 619, 623 (2004) ("Under our contention rule,

2. New York's and Riverkeeper's New and Amended Contention (NYS-26B/RK-TC-1B)

New York and Riverkeeper filed a new and amended contention, NYS-26B/RK-TC-1B, relating to the August 2010 reanalysis of metal fatigue recently submitted by Entergy to meet its Commitment #33.<sup>27</sup> Modifying the original consolidated contention (NYS-26/26A/RK-TC-1/1A), NYS-26B/RK-TC-1B is stated as:

Entergy's License Renewal Application does not include an adequate plan to monitor and manage the effects of aging due to metal fatigue on key reactor components in violation of 10 C.F.R. § 54.21(c)(1)(iii).<sup>28</sup>

Precipitated by the CUF reanalysis recently submitted by Entergy, the contention reiterates deficiencies noted in the original consolidated contention regarding the lack of sufficient detail in the AMP for how Entergy will address the situation when a given component's CUF value exceeds 1.0.<sup>29</sup> New York and Riverkeeper further allege that the CUF reanalysis continues to include a number of errors, including deficiencies in Entergy's AMP that make the calculation results unreliable.<sup>30</sup> At this point, however, New York and Riverkeeper state that this is not a contention of omission, because the contention also alleges that Entergy has not demonstrated that its AMP for metal fatigue is adequate to meet the requirements of 10 C.F.R. § 54.21(c)(1)(iii).<sup>31</sup> NYS-26B/RK-TC-1B also argues that Entergy's CUF analyses do not meet the guidance in the Generic Aging Lessons Learned (GALL) Report<sup>32</sup> because they do not

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Intervenors are not being asked to prove their case, or to provide an exhaustive list of possible bases, but simply to provide sufficient alleged factual or legal bases to support the contention, and to do so at the outset.”).

<sup>27</sup> New York and Riverkeeper Motion at 4-7.

<sup>28</sup> Petitioners State of New York and Riverkeeper, Inc. New and Amended Contention Concerning Metal Fatigue (Sept. 9, 2010) at 1 [hereinafter NYS-26B/RK-TC-1B].

<sup>29</sup> Id. at 6-9.

<sup>30</sup> Id. at 9-13.

<sup>31</sup> New York and Riverkeeper Motion at 5.

provide sufficient detail regarding the corrective actions Entergy will take to prevent CUFs from exceeding acceptable design code limits during the PEO.<sup>33</sup> NYS-26B/RK-TC-1B characterizes Entergy's reanalyses as inadequate under NRC regulations and the GALL Report because these reanalyses (1) inappropriately limited the number of components subject to fatigue analyses, (2) neither explain the methodology used to conduct their CUF analyses nor include a detailed error analysis, (3) exclude "a fatigue evaluation of important structures and fittings within the" reactor pressure vessel (RPV), (4) exclude from evaluation "the potential failure of highly fatigued structures and fittings under" certain types of "large thermal/pressure shock-type loads," and (5) contain lower safety margins that create more risk because the new CUFs have been "reduced by more than an order of magnitude."<sup>34</sup> The Intervenor also note that "Entergy has not committed to repair or replace components when the CUF approaches unity (1.0)."<sup>35</sup>

D. Entergy's and the NRC Staff's Responses

Entergy opposes admission of NYS-26B/RK-TC-1B as failing 10 C.F.R. § 2.309(f)(1)(iii)-(vi) because it is outside the scope of this proceeding, is immaterial to the NRC's licensing decision, alleges insufficient facts or expert opinions, and fails to raise a genuine dispute of material fact or law.<sup>36</sup> First, Entergy maintains that it has followed NRC guidance in selecting the components to undergo metal fatigue analysis and that there is no requirement in law or regulation that it expand that scope of components to be evaluated.<sup>37</sup> Second, Entergy insists that there is no legal requirement that it include an error analysis along with its metal fatigue

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<sup>32</sup> U.S. Nuclear Regulatory Commission, Generic Aging Lessons Learned (GALL) Report, NUREG-1801, Rev. 1, Vol. 2, Tabulation of Results (Sept. 2005) (ADAMS Accession No. ML052780376) [hereinafter GALL Report].

<sup>33</sup> Id. at 6 (citations omitted).

<sup>34</sup> NYS-26B/RK-TC-1B at 9-11.

<sup>35</sup> Id.

<sup>36</sup> Entergy Answer to New York and Riverkeeper Motion at 1.

<sup>37</sup> Id. at 9-12 (citations omitted).

evaluations.<sup>38</sup> Third, Entergy claims that reactor pressure vessel (RPV) “‘in-core’ structures and fittings do not require metal fatigue analyses under Parts 50 and 54 because they are not part of the [reactor coolant system] pressure boundary.”<sup>39</sup> Moreover, this issue is untimely because New York and Riverkeeper have not explained why they did not raise it earlier when Amendment 2 to Entergy’s LRA was filed.<sup>40</sup> Fourth, Entergy disputes NYS-26B/RK-TC-1B’s challenges to the vagueness of the methodology in Entergy’s reanalyses because New York and Riverkeeper have not identified any requirement that there be any additional or different analysis beyond what Entergy has already provided.<sup>41</sup> Fifth, Entergy asks the Board to reject NYS-26B/RK-TC-1B’s attack on the  $F_{en}$  factors, dissolved oxygen values, and plant transient numbers in Entergy’s reanalysis because Entergy’s analysis has been sufficiently conducted in accordance with the GALL Report, a procedure that the Applicant alleges was confirmed as acceptable by the Vermont Yankee Board.<sup>42</sup> Finally, Entergy asserts that its Fatigue Monitoring Program, through its Quality Assurance program, is not impermissibly vague because, consistent with the GALL Report, it contains corrective actions that have already been found sufficient through its CLB.<sup>43</sup>

The NRC Staff supports Entergy’s argument that NYS-26B/RK-TC-1B is not material to the NRC’s ultimate licensing decision and fails to raise a genuine dispute of a material fact.<sup>44</sup> First, the NRC Staff represents that completed  $CUF_{en}$  analyses are not required in Entergy’s

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<sup>38</sup> Id. at 12-16 (citations omitted).

<sup>39</sup> Id. at 16-18 (citations and capitalizations omitted).

<sup>40</sup> Id. at 17.

<sup>41</sup> Id. at 18-19 (citations omitted).

<sup>42</sup> Id. at 20-22 (citations omitted).

<sup>43</sup> Id. at 22-24 (citations omitted).

<sup>44</sup> NRC Staff Answer to New York and Riverkeeper Motion at 2, 12 (citations omitted).

LRA because CUF<sub>en</sub> analyses are not part of Entergy's current licensing basis and, pursuant to the Commission's decision in Vermont Yankee, "CUF<sub>en</sub> analyses or calculations that are not contained in a plant's current licensing basis cannot be TLAAs and cannot be a prerequisite to license renewal."<sup>45</sup> Second, the NRC Staff urges that a CUF<sub>en</sub> analysis need not require an error analysis because CUF<sub>en</sub> analyses themselves are not necessary prior to license renewal and, even if they were, New York and Riverkeeper have not shown that Entergy's calculations are so incorrect that an error analysis would make a difference in the decision to re-license Indian Point Units 2 and 3.<sup>46</sup> Third, the NRC Staff insists that because Entergy represents that it will comply with the GALL Report guidance and the NRC Staff's Final Safety Evaluation Report (FSER) has found that Entergy's reanalyses meet the GALL Report guidance, there is no litigable dispute with Entergy's LRA.<sup>47</sup> Fourth, the NRC Staff argues that because CUF<sub>en</sub> analyses are not prerequisites to license renewal, there is no requirement for Entergy to analyze any additional components beyond what it already has analyzed in its August 2010 reanalysis.<sup>48</sup> Fifth, the NRC Staff contends that, under Vermont Yankee, Entergy is not required to commit to repair or replace any components when a CUF<sub>en</sub> approaches 1.0 because it has the option of performing additional and refined analyses of CUF<sub>en</sub>s and thus, pursuant to the Board's contention admissibility decision in this proceeding, Entergy is not obliged to execute any action at a particular time because aging can be managed as needed.<sup>49</sup> Sixth, the NRC Staff states that because CUF<sub>en</sub> analyses are not required before license renewal, employing bounding values for uncertainties in those analyses is unnecessary and, moreover, Intervenors have not

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<sup>45</sup> Id. at 12-13 (citations omitted).

<sup>46</sup> Id. at 13-14 (citations omitted).

<sup>47</sup> Id. at 14-15 (citations omitted).

<sup>48</sup> Id. at 15-16 (citations omitted).

<sup>49</sup> Id. at 16-17 (citations omitted).

demonstrated why the bounding values they propose be used are more appropriate than what Entergy's LRA proposes to use.<sup>50</sup> Seventh, the NRC Staff avers that the GALL Report does not demand analyses of reactor vessel internals and, moreover, New York's and Riverkeeper's claims over these components in relation to CUF<sub>en</sub> analyses are impermissibly late.<sup>51</sup> Finally, given that CUF<sub>en</sub> analyses are not prerequisites to license renewal, the NRC Staff argues that the variables used in Entergy's reanalyses are immaterial to the NRC's licensing decision.<sup>52</sup>

E. New York's and Riverkeeper's Reply

As a threshold matter, New York and Riverkeeper aver that Vermont Yankee holds that the question of Entergy's compliance with the GALL Report may properly be the subject of a license renewal proceeding.<sup>53</sup> Further, New York and Riverkeeper claim that just because NRC regulations do not explicitly mandate that an expanded range of components be analyzed or that the applicant submit an error analysis, the GALL Report anticipates the expansion of the components analyzed as the CUF<sub>en</sub> approaches 1.0, and New York and Riverkeeper have provided expert analyses showing that their claims are material on this matter, and why the components Entergy analyzed in August 2010 were insufficient to demonstrate compliance with the guidance set out in the GALL Report.<sup>54</sup> New York and Riverkeeper also state that Entergy's failure to conduct error analyses, demonstrate the methodologies used in its CUF<sub>en</sub> analyses, and produce its thermal hydraulic equations or WESTEMS Code Manual, are all valid bases for this contention because they are all relevant to the sufficiency of Entergy's AMP.<sup>55</sup> Moreover, New York and Riverkeeper contend that there is a material dispute within the scope of this

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<sup>50</sup> Id. at 17-18 (citations omitted).

<sup>51</sup> Id. at 18-19 (citations omitted).

<sup>52</sup> Id. at 19-20 (citations omitted).

<sup>53</sup> New York and Riverkeeper Reply at 6-7 (citations omitted).

<sup>54</sup> Id. at 7-11 (citations omitted).

<sup>55</sup> Id. at 14-21 (citations omitted).

license renewal proceeding over whether, using the CUF analyses it has submitted, Entergy's AMP meets the GALL Report guidance.<sup>56</sup> Finally, because of the questions raised by their own experts and the rationales used by Entergy to demonstrate the adequacy of its reanalysis to meet NRC regulations, New York and Riverkeeper argue that they have demonstrated the existence of a genuine factual dispute over the  $F_{en}$  factors used in Entergy's reanalysis, the dissolved oxygen levels used in that reanalysis, the transient numbers used in that reanalysis, and the need for benchmarking of the code used by Entergy in its reanalysis.<sup>57</sup>

## II. Board Decision

As explained herein, the Board finds that NYS-26B/RK-TC-1B meets the requirements in 10 C.F.R. § 2.309(f)(2) as a timely filing by addressing new information that is materially different from what was previously available. NYS-26B/RK-TC-1B also meets the criteria for contention admissibility in 10 C.F.R. § 2.309(f)(1). Based on this, the Board admits the contention NYS-26B/RK-TC-1B as superseding NYS-26/26A/RK-TC-1/1A.

### A. Fulfillment of the Regulatory Requirements of 10 C.F.R. § 2.309(f)(2) and 2.309(f)(1)

The new contention meets the requirements of 10 C.F.R. § 2.309(f)(2) in that: (1) the refined analysis upon which it is based was not available until August 9, 2010, (2) the refined analysis includes numerous modifications to the CUF calculation methodology and addresses different components, resulting in materially different determinations than those that were originally included in the LRA, and (3) the amended contention was timely submitted within the 30-day period prescribed by the Board's July 1, 2010 Scheduling Order.

NYS-26B/RK-TC-1B also meets all of the requirements of 10 C.F.R. § 2.309(f)(1). It is within the scope of license renewal under Section 2.309(f)(1)(iii) and material to the findings the NRC must make in granting or denying Entergy's LRA under Section 2.309(f)(1)(iv). It deals

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<sup>56</sup> Id. at 21-24 (citations omitted).

<sup>57</sup> Id. at 25-30 (citations omitted).

with the same issues addressed in the previously admitted contention, NYS-26/26A/RK-TC-1/1A, but now addresses the refined analysis of CUF values submitted in NL-10-082.<sup>58</sup> New York and Riverkeeper have directly challenged the sufficiency, accuracy, and reliability of the CUF calculations as well as the lack of specificity in Entergy's AMP to assure that its management of metal fatigue meets the requirements of 10 C.F.R. § 54.21(c)(1)(iii). These allegations in the new contention over the proposed period of extended operation are backed by affidavits from the same expert witnesses that reviewed the original AMP provided in the LRA, thus providing the requisite alleged facts or expert opinions pursuant to 10 C.F.R.

§ 2.309(f)(1)(v).<sup>59</sup>

Finally, New York and Riverkeeper have provided sufficient information to demonstrate that a genuine dispute exists with the Applicant regarding material issues of fact.<sup>60</sup> Foremost, the Intervenor has raised the question of whether the AMP provides adequate detail to meet the requirements of 10 C.F.R. § 54.21(a) and 54.21(c)(1)(iii) and whether the AMP meets the

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<sup>58</sup> The Board notes that Entergy incorporated the environmentally assisted fatigue factors (EAF, the "F<sub>en</sub>" portion of a "CUF<sub>en</sub>" analysis) in its CUF calculations for its LRA, Amendment 2 to its LRA, and its recently submitted reanalysis. See NL-10-082, Attach. 1, Fatigue Monitoring Program Clarification at 1-6; id., Attach. 2, Regulatory Commitment List, Rev. 3 at 15; NL-08-021, Attach. 1, Fatigue Monitoring Program Clarification at 1-6; id., Attach. 2, Regulatory Commitment List, Rev. 3 at 15; LRA § 4.3.3. While it is clear from the Commission's ruling in Vermont Yankee that an Applicant cannot be required to perform CUF<sub>en</sub> calculations in evaluating TLAAs for meeting Section 54.21(c)(1)(i) and (ii), this is not an issue here because Entergy volunteered to perform CUF<sub>en</sub> calculations in all instances and has used the results from these calculations in addressing Section 54.21(c)(1)(iii). See Vermont Yankee, CLI-10-17, 72 NRC at \_\_\_ (slip op. at 48); NL-10-082, Attach. 1, Fatigue Monitoring Program Clarification at 1. As previously mentioned, for brevity, the term CUF will be used in this Memorandum and Order when referring to these calculations, recognizing that they include the EAFs. This is also consistent with the regulations, which do not recognize any difference between CUF and CUF<sub>en</sub>, except that the EAF is not in most nuclear plants' CLBs and therefore, by definition, cannot be considered a TLAA in accordance with the definition of a TLAA in 10 C.F.R. § 54.3(a)(6). See Vermont Yankee, CLI-10-17, 72 NRC at \_\_\_ (slip op. at 41).

<sup>59</sup> New York and Riverkeeper Motion, Declaration of Dr. Richard T. Lahey, Jr. ¶¶ 1-14 (Sept. 8, 2010) [hereinafter Lahey Decl.]; id., Declaration of Dr. Joram Hopenfeld ¶¶ 5-21 (Sept. 9, 2010) [hereinafter Hopenfeld Decl.].

<sup>60</sup> See 10 C.F.R. § 2.309(f)(1)(vi).

guidance of the GALL Report by providing an adequate plan of action to assure that the usage factors of critical reactor components remain less than 1.0 during the PEO.

B. AMP Inadequacies

Entergy's CUF analyses for IPEC and, specifically, the environmentally adjusted factors of the calculation, are but one, but not the only, basis proffered in support of this contention. While Entergy, in its Answer, tends to focus on these analyses (and specifically the EAF portion of the calculations),<sup>61</sup> the contention NYS-26B/RK-TC-1B is broader, contesting the overall inadequacy of the Applicant's AMP in regard to its lack of specificity. NYS-26B/RK-TC-1B alleges that the lack of detail demonstrating the extent, adequacy, and relevance of Entergy's FMP monitoring locations, trigger points, and proposed actions in managing aging for metal fatigue fails to comply with NRC regulations and guidance in the GALL Report.<sup>62</sup>

In defense of its FMP (the designated AMP for IPEC), Entergy uses the NRC Staff's FSER as support for the proposition that it "complies fully with NRC regulations and GALL Report recommendations, and provides the level of detail necessary for an AMP."<sup>63</sup> Using the NRC Staff's conclusions in its FSER, Entergy posits that "[t]here . . . is no ambiguity or uncertainty about the timing or scope of repair and replacement activities under the Fatigue Monitoring Program," "[t]he program requires that corrective action be implemented before the plant exceeds the analyzed number of transient cycles," and that "IPEC procedures contain

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<sup>61</sup> Entergy incorrectly represents the Board's initial admission of NYS-26/26A and Riverkeeper TC-1/1A as a contention dealing with various aspects of "CUF<sub>en</sub>" analyses required to comply with TLAAs; the Board notes that it only referenced "CUF" analyses, and it never specifically used the term "CUF<sub>en</sub>" in its decision. See LBP-08-13, 68 NRC at 137-40, 172; cf. Entergy Answer to New York and Riverkeeper Motion at 5.

<sup>62</sup> NYS-26B/RK-TC-1B at 6-13.

<sup>63</sup> Entergy Answer to New York and Riverkeeper Motion at 15-16, 23.

certain specific 'alert levels' that trigger the initiation of corrective actions under the Fatigue Monitoring Program."<sup>64</sup>

Nevertheless, the level of detail available to and reviewed by the NRC Staff in reaching its conclusions in its FSER is not apparent in either the brief description of the FMP provided in the LRA,<sup>65</sup> LRA Amendment 2,<sup>66</sup> the responses to the NRC Staff's RAI,<sup>67</sup> or in the NRC Staff's FSER.<sup>68</sup> In contrast, NYS-26B/RK-TC-1B raises litigable issues backed by expert affidavits that contradict the FSER's conclusions.<sup>69</sup> Entergy and the NRC Staff say that there is sufficient detail in the Applicant's AMP, while New York's and Riverkeeper's expert witnesses raise doubt as to the adequacy of Entergy's AMP. We propose to sort out these differing opinions at hearing, because it is apparent to us that such a review of FMP details is needed to determine whether Entergy's AMP is consistent with the GALL Report and meets the requirements of Sections 54.21(a) and 54.21(c)(1)(iii).

The NRC Staff states that as articulated in the GALL Report there are

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<sup>64</sup> Id. at 24.

<sup>65</sup> LRA, App. B § B.1.12.

<sup>66</sup> LRA, App. A § A.2.1.11; NL-08-021, Attach. 1, Fatigue Monitoring Program Clarification at 2-3.

<sup>67</sup> See Letter from Fred R. Dacimo, Entergy Nuclear Northeast, to U.S. Nuclear Regulatory Commission, NL-08-84 (May 16, 2008), Attach. 1, Environmental Fatigue Evaluations at 2 (ADAMS Accession No. ML081490317) [hereinafter NL-08-84].

<sup>68</sup> U.S. Nuclear Regulatory Commission, Safety Evaluation Report Related to the License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3, Docket Nos. 50-247 and 50-286, Entergy Nuclear Operations, Inc., NUREG-1930, Vol. 2 (Nov. 2009) at 3-78 to 3-81, 4-41 to 4-47 (ADAMS Accession No. ML093170671) [hereinafter FSER].

<sup>69</sup> Likewise, the Commission has stated that "the focus of a hearing on a proposed licensing action is the adequacy of the application to support the licensing action, not the nature of the NRC Staff's review." Dominion Nuclear Connecticut, Inc. (Millstone Nuclear Power Station, Unit 3), CLI-08-17, 68 NRC 231, 237 (2008) (citing Pa'ina Hawaii, LLC, CLI-08-03, 67 NRC 151, 168 n.73 (2008)).

three ways that a license renewal applicant proposing to use an AMP may comply with 10 C.F.R. § 54.21(c)(1)(iii): [r]epair of the component, replacement of the component, and conducting more rigorous analyses.<sup>70</sup>

The NRC Staff seems to imply that performing one of these actions is all that is needed by an applicant to comply with the regulations. What the NRC Staff fails to note is that these actions relate to only one of ten elements<sup>71</sup> present in the GALL Report that an applicant would need to satisfy in order to be consistent with the generic AMP set out in the GALL Report as a model for meeting Section 54.21(c)(1)(iii).<sup>72</sup> The adequacy of Entergy's AMP depends upon a much broader range of activity than satisfying just one of the ten GALL Report elements through predictive CUF analyses.<sup>73</sup> Only by describing the parameters of the CUF calculations, demonstrating their methodology, and addressing all of the elements in the Gall Report would an applicant satisfy the goals of the GALL Report, which are to prevent the applicant from exceeding the design limit for fatigue with an AMP that "monitors and tracks the number of critical thermal and pressure transients for the selected reactor coolant system components" using analyses that include "the effects of the coolant environment on component fatigue life."<sup>74</sup>

C. LRA Amendment 2/Commitment #33

The description of the FMP has been augmented by Amendment 2 to Entergy's LRA to specify that Entergy will track CUFs during the PEO by updating these calculations, and will

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<sup>70</sup> NRC Staff Answer to New York and Riverkeeper Motion at 9 (citing Vermont Yankee, CLI-10-17, 72 NRC at \_\_\_ (slip op. at 12 & n.46, 24 n.101)).

<sup>71</sup> The other nine elements include the scope of the program, preventive actions, parameters monitored/ inspected, detection of aging effects, monitoring and trending, acceptance criteria, confirmation process, administrative controls, and operating experience.

<sup>72</sup> GALL Report at X M-1 to X M-2.

<sup>73</sup> While the NRC Staff has performed such a review of the ten elements of the GALL Report in its FSER, see NRC Staff Answer to New York and Riverkeeper Motion at 10-11 (citations omitted), the intervenors have raised legitimate questions relating to the adequacy of Entergy's AMP.

<sup>74</sup> GALL Report at X M-1.

take corrective actions (implemented in accordance with Entergy's quality assurance and corrective action programs) before CUF values equal 1.0 or more.<sup>75</sup> Even with this, however, there remains a genuine issue as to whether this augmented description has sufficient details to demonstrate the adequacy of Entergy's FMP in meeting Section 54.21(c)(1)(iii) in assuring that aging from metal fatigue is managed through the PEO.

Amendment 2 also added Commitment #33 to Entergy's existing FMP. Inter alia, this commitment includes two steps relating to aging management: (1) a refinement of its fatigue analysis (including EAFs) during the relicensing period to verify that CUFs remain less than 1.0, and (2) a promise to repair or replace the affected locations before CUF values exceed 1.0.<sup>76</sup> Because Commitment #33 is to be executed "[a]t least 2 years prior to entering the period of extended operation," the refined fatigue analysis in step 1 is, by definition, a predictive one that is calculated before the PEO.<sup>77</sup> On the other hand, how the CUF value is utilized in step 2 of Commitment #33 as a trigger point for repair or replacement is uncertain.<sup>78</sup> Clarification of this issue and the question as to whether Commitment #33 (combined with the other details of the FMP) meets the regulatory requirements is a factual issue appropriately addressed at an evidentiary hearing.

Entergy recently completed its refined CUF analyses.<sup>79</sup> Because all the refined, predictive CUF values are less than 1.0 at face value, Entergy argues that there is no need for it

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<sup>75</sup> See NL-10-082, Attach. 1, Environmental Fatigue Evaluations at 2; NL-08-021, Attach. 1, Fatigue Monitoring Program Clarification at 2-3; LRA, App. A § A.2.1.11.

<sup>76</sup> NL-08-021, Attach. 2, Regulatory Commitment List, Rev. 3 at 15.

<sup>77</sup> See id.

<sup>78</sup> For example, does it employ a predictive CUF prior to the PEO, the current value of a tracking CUF calculated during the PEO, or a predictive CUF projecting an existing CUF (calculated during the PEO) by extrapolation through the PEO?

<sup>79</sup> NL-10-082, Attach. 1, Environmental Fatigue Evaluations at 1-3.

to address step 2 of Commitment #33.<sup>80</sup> But, as discussed further below, New York and Riverkeeper have raised material allegations relating to the accuracy and reliability of these calculations which question whether the values are equal to or exceed unity. Furthermore, Entergy is also responsible for implementing the other aging management activities presented in its FMP, the adequacy of which is also contested by NYS-26B/RK-TC-1B.

D. CUF Calculations

Underpinning the instant contention are New York's and Riverkeeper's allegations that Entergy's CUF calculations are too limited in scope, incomplete, inaccurate, imprecise, and, as a result, unreliable for adequately assuring that the metal in key reactor components will not fail during the PEO. Entergy objects to NYS-26B/RK-TC-1B's criticism for failure to address several issues including: (1) omitting an error analysis (a requirement the Applicant states is not required by the regulations), (2) relying "on incorrect or undisclosed parameters" in its metal fatigue analyses (to which Entergy counters that such a proposition by the Intervenors "overlook[s] directly relevant and readily available" LRA information and the recent EAF reanalyses), and (3) lacking a detailed and prescriptive AMP (ignoring, according to Entergy, the detailed acceptance criteria of the American Society of Mechanical Engineers (ASME) Code Section XI as implemented by its FMP).<sup>81</sup> Entergy also alleges that New York and Riverkeeper did not substantiate alleged errors and uncertainties in the Applicant's revised CUF analyses to demonstrate that there would be a material difference in the outcome.<sup>82</sup>

The NRC Staff represents that the contention is misdirected because: (1) "an 'error analysis' is not required to be submitted with the CUF<sub>en</sub> analysis," (2) "the LRA contains sufficient detail" and Intervenors have not demonstrated "an inadequate scope of the refined

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<sup>80</sup> Id. at 4.

<sup>81</sup> Entergy Answer to New York and Riverkeeper Motion at 4.

<sup>82</sup> Id. at 4-5.

CUF<sub>en</sub> analysis,” (3) “there is no requirement for advance repair when a CUF<sub>en</sub> approaches 1.0, (4) there is no requirement that bounding values must be used, (5) “portions of the contention are beyond the scope of metal fatigue,” and (6) details on variables used in these calculations are not material.<sup>83</sup>

In addressing Entergy’s and the NRC Staff’s arguments, New York and Riverkeeper have countered these merits-based statements with opposing positions backed by expert witness affidavits,<sup>84</sup> providing for more than the “unsupported speculation” alleged by the Applicant and the NRC Staff. Accordingly, this contention is adequately pled under Section 2.309(f)(1)(v).

Many of the points New York and Riverkeeper make in regard to the adequacy of the Applicant’s AMP and the counterpoints provided by Entergy and the NRC Staff raise material questions that warrant resolution at hearing. The Board notes that Entergy uses the Vermont Yankee Board’s initial decision to support Entergy’s position on several of these allegations.<sup>85</sup> But the Vermont Yankee decision was reached after an adjudicatory hearing addressed the merits for each of these issues as they related to specific conditions at the Vermont Yankee Nuclear Power Station’s boiling water reactor. This Board will take a similar procedural approach for resolving these merit-based allegations for the Indian Point Unit 2 and Indian Point Unit 3 pressurized water reactors.

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<sup>83</sup> See NRC Staff Answer to New York and Riverkeeper Motion at 13-20 (citations and capitalizations omitted).

<sup>84</sup> See, e.g., Lahey Decl.; Hopenfeld Decl.

<sup>85</sup> Entergy Answer to New York and Riverkeeper Motion at 15, 20-21 (citing Entergy Nuclear Vermont Yankee, LLC, & Entergy Nuclear Operations, Inc. (Vermont Yankee Nuclear Power Station), LBP-08-25, 68 NRC 763, 804-806, 814, 823 (2008), rev’d & remanded on other grounds, CLI-10-17, 72 NRC \_\_ (slip op.)).

New York and Riverkeeper allege that Entergy is obligated to expand the CUF analysis to additional components because of the initial CUF calculation<sup>86</sup> (as suggested by the GALL Report and Electric Power Research Institute (EPRI) guidance<sup>87</sup>) and to include transients from Loss of Coolant Accidents (LOCAs) or Anticipated Transients without SCRAM (ATWS).<sup>88</sup> In part, this allegation is based on the fact that the initial (and now obsolete) CUF calculations provided by Entergy in its LRA well exceeded the critical value of 1.0 for many components. In objecting to New York's and Riverkeeper's allegation, Entergy and the NRC Staff state that the Applicant is not obligated by law to expand the scope of such components subject to review. As Entergy and the NRC Staff counter, the "refined" analyses show that the CUF results for the recommended components are all below 1.0, negating any need to expand the component list or to include other transients.<sup>89</sup> Having said this, if at hearing New York and Riverkeeper show that the accuracy and reliability of Entergy's analyses (or lack thereof) demonstrate that the values for these components indeed exceed the critical value of 1.0, the question becomes whether the absence of the expanded program as suggested by the GALL Report and EPRI guidance precludes a finding that the Applicant has complied with Sections 54.21(a) and 54.21(c)(1)(iii).

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<sup>86</sup> NYS-26B/RK-TC-1B at 8-10, 12, 17-18; see also Entergy Answer to New York and Riverkeeper Motion at 9-12; NRC Staff Answer to New York and Riverkeeper Motion at 15-16.

<sup>87</sup> GALL Report at X M-2; Electric Power Research Institute, Materials Reliability Program: Guidelines for Addressing Fatigue Environmental Effects in a License Renewal Application (MRP-47, Rev. 1) (Sept. 2005) at 3-4 to 3-6 (ADAMS Accession No. ML062690340) [hereinafter MRP-47].

<sup>88</sup> NYS-26B/RK-TC-1B at 10; see also Entergy Answer to New York and Riverkeeper Motion at 17-18; NRC Staff Answer to New York and Riverkeeper Motion at 20.

<sup>89</sup> See NL-10-082, Attach. 1, Environmental Fatigue Evaluations at 2-3.

E. The Commission's Ruling in Vermont Yankee

For many of these disputed issues,<sup>90</sup> the NRC Staff contends that they are inadmissible as a matter of law because the Commission, through its recent ruling in Vermont Yankee,<sup>91</sup> “has determined that the CUF<sub>en</sub> analyses included as part of an AMP are not prerequisites to license renewal.”<sup>92</sup> Nevertheless, the Board finds that the Commission’s ruling in Vermont Yankee is not dispositive in this instance for the following reasons.

First, the NRC Staff’s argument is founded on the logic that CUF<sub>en</sub> values are not TLAAs because CUF<sub>en</sub> values are not part of the CLB, and therefore do not meet the definition of a TLAA under 10 C.F.R. § 54.3(a)(6)—a conclusion consistent with the Commission’s Vermont Yankee ruling.<sup>93</sup> As the Commission noted, the Vermont Yankee Board:

was not correct in equating the fatigue analyses under subsections (i) and (ii) with the fatigue analyses under subsection (iii) [; and] . . . failed to recognize that an applicant may use similar or identical methodology to calculate the fatigue usage factor for the TLAA and for the AMP—regardless of how it seeks to comply with section 54.21(c)(1), whether through a predictive TLAA or by the use of an AMP.<sup>94</sup>

The Commission went on to note that:

our regulations contain no requirement that an applicant complete a subsection (iii) fatigue analysis prior to the issuance of a renewed license, and an applicant need not do so unless the analysis is needed to support a demonstration that the tracking AMP will satisfy our regulatory requirements—here, such an analysis

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<sup>90</sup> See NRC Staff Answer to New York and Riverkeeper Motion at 12-17, 20.

<sup>91</sup> See Vermont Yankee, CLI-10-17, 72 NRC at \_\_\_ (slip op. at 41).

<sup>92</sup> NRC Staff Answer to New York and Riverkeeper Motion at 20.

<sup>93</sup> Vermont Yankee, CLI-10-17, 72 NRC at \_\_\_ (slip op. at 48).

<sup>94</sup> Id. at \_\_\_ (slip op. at 41). Specifically, “an applicant may use a similar or identical methodology to calculate the fatigue usage factor for the so-called ‘predictive’ TLAA [used for addressing Section 54.21(c)(1)(i) and (ii),] and for the so-called ‘tracking’ [CUF used in an] AMP [in addressing Section 54.21(c)(1)(iii)].” See id. at \_\_\_ (slip op. at 43). What remains unclear is the degree to which, if any, a “predictive” CUF may address Subsection (iii), as is the case here and was the case in Vermont Yankee.

would be used to demonstrate that the AMP is consistent with the GALL Report.<sup>95</sup>

For this proceeding, New York's and Riverkeeper's new contention does not demand that CUF analyses be performed prior to the issuance of a renewed license, but rather focuses on the inadequacy of these calculations when used to support an AMP in meeting Subsection (iii).<sup>96</sup> Furthermore, there was no need for New York and Riverkeeper to demand CUF<sub>en</sub> calculations, because Entergy had already, on its own, incorporated such EAFs in its CUF calculations.<sup>97</sup> Also, Entergy clarified in Commitment #33 that the calculations were done to meet the management of aging as described in Section 54.21(c)(1)(iii) and were therefore not, nor could they be, TLAAs.<sup>98</sup>

While a Board cannot mandate that an Applicant perform CUF<sub>en</sub>s as TLAAs to meet either Subsection (i) or Subsection (ii),<sup>99</sup> here Entergy, on its own, has used the EAFs in its calculations for the LRA and the subsequent "refined" analyses. There is nothing in the regulations prohibiting the Applicant from doing so, and, in fact, it appears to the Board that it is the technically responsible approach to take when performing these calculations—an action that is consistent with the NRC Staff's recommendations and its review criteria.<sup>100</sup>

But once an applicant has chosen to include EAFs in its CUF calculations, there is nothing in NRC regulations or in the Commission's recent decision in Vermont Yankee that prohibits an intervenor from questioning the adequacy, reliability, and breadth of these

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<sup>95</sup> Id. at \_\_\_ (slip op. at 43) (emphasis added).

<sup>96</sup> See New York and Riverkeeper Reply at 2.

<sup>97</sup> See NL-10-082, Attach. 1, Environmental Fatigue Evaluations at 1.

<sup>98</sup> See Entergy Motion at 15-16 (citations omitted).

<sup>99</sup> See Vermont Yankee, CLI-10-17, 72 NRC at \_\_\_ (slip op. at 40-41).

<sup>100</sup> See GSI-190 Closeout Memorandum at 1; SRP § 4.3.1.2.

calculations when applied to Entergy's AMP under Section 54.21(c)(1)(iii), as New York and Riverkeeper have done.

Second, as previously discussed, the NRC Staff argues that "[t]he petition incorrectly states that Entergy must include CUF<sub>en</sub> analyses as part of its LRA" and "incorrectly considers the environmentally-adjusted CUF<sub>en</sub> to be TLAAAs based upon the April 2007 [L]RA."<sup>101</sup> However, the NRC Staff fails to note that, in the cited sections, the opposing parties only use the term TLAA to refer to Entergy's initial attempts in its LRA to meet Subsection (i) with these calculations, and New York and Riverkeeper have alleged that the CUF analyses are required as part of the application only to the degree that Entergy has relied on these values to demonstrate an adequate AMP for meeting Subsection (iii).<sup>102</sup> Furthermore, in the same paragraph, the NRC Staff ignores the fact that New York and Riverkeeper's amended contention is based on the claim that Entergy's attempt to meet Section 54.21(c)(1)(iii) through its metal fatigue reanalyses fails for several reasons, including that the "AMP lacks the detail contemplated by GALL and required to determine whether it is in fact an adequate aging management plan."<sup>103</sup>

The NRC Staff also mischaracterizes the Commission's Vermont Yankee decision when it states that "the Commission observed that NRC regulations contain no requirement that an applicant complete its AMP (including its CUF<sub>en</sub> analyses) prior to the issuance of a renewed license,"<sup>104</sup> when the Commission in fact said "[o]ur regulations contain no requirement that an applicant complete a subsection (iii) fatigue analysis prior to the issuance of a renewed

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<sup>101</sup> NRC Staff Answer to New York and Riverkeeper Motion at 12 (referencing NYS-26B/RK-TC-1B at 6 ¶¶ 11, 7).

<sup>102</sup> NYS-26B/RK-TC-1B at 6 ¶¶ 11, 7 ¶¶ 15.

<sup>103</sup> Id. at 6 ¶¶ 11.

<sup>104</sup> NRC Staff Answer to New York and Riverkeeper Motion at 9 (emphasis added).

license.”<sup>105</sup> It is not the completeness of the AMP prior to the renewed license that the Commission addressed; instead, it held that a Subsection (iii) fatigue analysis need not be completed if an applicant does not choose to use the results from these calculations to demonstrate that its AMP meets the regulatory requirements. Specifically, the Commission clarified that an applicant need not perform CUF calculations “unless the analysis is needed to support a demonstration that the tracking AMP will satisfy our regulatory requirements.”<sup>106</sup> Because Entergy is using CUF calculations to demonstrate the adequacy of its AMP, these calculations are subject to review in this proceeding. New York’s and Riverkeeper’s challenge to the “refined” CUF analysis is addressed specifically to the use of the results of these analyses in meeting Section 54.21(c)(1)(iii), which is exactly the kind of challenge that the Commission has permitted through its Vermont Yankee decision.

Third, NYS-26B/RK-TC-1B further differs from the contention that was held inadmissible in Vermont Yankee by challenging whether Entergy’s AMP is adequate enough to meet Subsection (iii), and whether it meets the recommendations of the GALL Report. As the Commission noted:

An applicant may commit to implement an AMP that is consistent with the GALL Report and that will adequately manage aging. But such a commitment does not absolve the applicant from demonstrating, prior to issuance of a renewed license, that its AMP is indeed consistent with the GALL Report. We do not simply take the applicant at its word.<sup>107</sup>

New York and Riverkeeper have provided just such a challenge to the adequacy of Entergy’s AMP and specifically to its FMP that has been designated by Entergy to serve as its AMP. Because Entergy calculated CUF analyses as part of its efforts to meet Subsection (iii), the methodology and breadth of these calculations may come under scrutiny. Accordingly, we

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<sup>105</sup> Vermont Yankee, CLI-10-17, 72 NRC at \_\_\_ (slip op. at 43) (emphasis added).

<sup>106</sup> Id.

<sup>107</sup> Id. at \_\_\_ (slip op. at 45).

find that New York and Riverkeeper have raised a genuine dispute over material fact under 10 C.F.R. § 2.309(f)(1)(vi).

Finally, other observations by the Commission in Vermont Yankee noted by the NRC Staff relate to the NRC Staff's position that an Applicant cannot be required by law to submit CUF<sub>en</sub> analyses as TLAAs to meet Subsections (i) or (ii).<sup>108</sup> The Board agrees with the NRC Staff's position that it is a mistake to view CUF<sub>en</sub> analyses as TLAAs because that would be contrary to the Commission's decision in CLI-10-17. But that is not the case here. Entergy has taken upon itself to include EAFs in its CUF analyses and is submitting them, not as TLAAs in support of meeting Subsections (i) and (ii), but in an effort to meet Subsection (iii). Having done so, the methodology used and the correctness of the results obtained are open for review to the degree that the Applicant's AMP relies on them for aging management associated with metal fatigue.

#### F. Other Issues

As Entergy notes, "[c]onsistent with Commission approved practice, an applicant may perform a more accurate fatigue analysis by evaluating, for example, actual plant transient cycles rather than using assumed design cycles."<sup>109</sup> This is the approach taken by Entergy's AMP for metal fatigue at IPEC. Specifically, Entergy's FMP, which is the designated AMP for metal fatigue in its LRA, is described as "an existing program that tracks the number of critical thermal and pressure transients for selected reactor coolant system components."<sup>110</sup> But this raises a fundamental question as to what role, if any, the predictive CUF analyses (which are calculated well before the PEO) serve in Entergy's FMP to address the requirements of Section 54.21(c)(1)(iii) in assuring that the effects of aging for metal fatigue will be adequately managed

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<sup>108</sup> See, e.g., NRC Staff Answer to New York and Riverkeeper Motion at 12 & n.21.

<sup>109</sup> Entergy Answer to New York and Riverkeeper Motion at 9-10; Vermont Yankee, CLI-10-17, 72 NRC at \_\_\_ (slip op. at 23-24 & n.99).

<sup>110</sup> LRA, App. B § B.1.12 at B-44 (emphasis added).

for the PEO. Stated another way, how does a predictive CUF (performed during the re-licensing process) achieve the stated goal of Entergy's FMP to track the effects of transients during the PEO, and how do the predictive values help assure that the actual effects from the actual transients occurring during the PEO do not exceed the allowable cumulative fatigue factor for each component as required under Entergy's AMP?<sup>111</sup> These questions present a genuine dispute of fact on an issue that is material to the NRC's licensing decision and within the scope of this license renewal proceeding.<sup>112</sup>

Entergy suggests that New York's and Riverkeeper's new contention seeks impermissible discovery by requesting details of the thermal-hydraulic analysis methodology and heat transfer coefficients in Westinghouse's computer code that was used to perform the revised CUF analysis.<sup>113</sup> The Applicant goes on to claim that "none of [New York's and Riverkeeper's] criticisms of Westinghouse's evaluation of thermal-hydraulic conditions at IPEC is sufficiently supported or material to warrant admission."<sup>114</sup> Entergy might eventually be correct that the Intervenor's criticisms are not well taken on the merits, but at this point the information and documents the Intervenor's allege they need to fully evaluate this issue (e.g., thermal-hydraulic equations, WESTEMS Code Manual) have not yet been submitted to them for review.<sup>115</sup> This information might be useful to New York and Riverkeeper in ascertaining the effectiveness of the aging management program as it relates to the accuracy and reliability of the resulting CUF values that will be calculated to track metal fatigue during the PEO, and should be produced pursuant to 10 C.F.R. § 2.336. Therefore, because New York and

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<sup>111</sup> See id.

<sup>112</sup> See 10 C.F.R. § 2.309(f)(1)(iii), (iv), and (vi).

<sup>113</sup> Entergy Answer to New York and Riverkeeper Motion at 5 & n.11, 18-19.

<sup>114</sup> Id. at 19.

<sup>115</sup> New York and Riverkeeper Reply at 20.

Riverkeeper have presented expert opinions challenging Westinghouse's evaluation of thermal-hydraulic conditions at IPEC, they have presented sufficient alleged expert opinion for this element of the contention under 10 C.F.R. § 2.309(f)(1)(v), and will have access to the thermal-hydraulic equations through mandatory disclosure under 10 C.F.R. § 2.336.

Entergy also claims that the new and amended contention is untimely as far as New York and Riverkeeper posit that Entergy should consider RPV "in-core" structures and certain accident loads as part of its fatigue analysis—arguments that Entergy says could have been presented based on the original LRA<sup>116</sup> without further elaboration. The Board finds that this claim by the Intervenors is consistent with the pre-existing consolidated contention that questioned the adequacy of Entergy's AMP; we further note that a petitioner is not required to present all of its bases with the original submittals, and may raise other bases during the proceeding as long as they are within the bounds of the contention as originally submitted. We find that the Intervenors' claim meets these criteria. While Entergy goes on to argue that RPV "in-core" structures do not fall under potential aging management issues,<sup>117</sup> the resolution of this fact-based argument is best left to a hearing.

A recurring theme in the NRC Staff's arguments is that the challenges raised by New York and Riverkeeper do not identify actions that are expressly required by regulation or law.<sup>118</sup> The Intervenors counter that these allegations must be addressed by Entergy in order to demonstrate the adequacy of its AMP in accordance with Section 54.21(c)(1)(iii).<sup>119</sup> The Board finds that the Intervenors' claims raise a genuine dispute of material fact or law as required by 10 C.F.R. § 2.309(f)(1)(vi).

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<sup>116</sup> Entergy Answer to New York and Riverkeeper Motion at 16-17.

<sup>117</sup> Id.

<sup>118</sup> NRC Staff Answer to New York and Riverkeeper Motion at 13-17.

<sup>119</sup> See New York and Riverkeeper Motion at 6-7.

III. Conclusion

The Board finds that New York's petition for leave to file NYS-26B/RK-TC-1B, a new and amended contention concerning Entergy's reanalysis of metal fatigue, is a timely filing that addresses new information material to Entergy's LRA that was not previously available pursuant to 10 C.F.R. § 2.309(f)(2)(i)-(iii) and meets the general contention admissibility criteria of 10 C.F.R. § 2.309(f)(1).

Entergy and the NRC Staff repeatedly argue that the regulations do not specifically require the actions identified in the new and amended contention. In the Board's view, however, New York and Riverkeeper clearly base their contention on 10 C.F.R. § 54.21(a) and (c)(1)(iii)—a regulation that requires an applicant to demonstrate that the effects of aging will be adequately managed for metal fatigue through the period of extended operation. Both Entergy and the NRC Staff also proffer facts that they argue counter New York's and Riverkeeper's factual arguments questioning the adequacy of Entergy's AMP—a clear example of conflicting expert opinions that must be resolved on the merits after a hearing.

We admit this new contention, and find that it supersedes NYS-26/26A/RK-TC-1/1A, and likewise renders moot Entergy's Motion for Summary Disposition. Therefore, we dismiss both NYS-26/26A/RK-TC-1/1A and deny Entergy's Motion for Summary Disposition of that contention.

It is so ORDERED.

THE ATOMIC SAFETY  
AND LICENSING BOARD<sup>120</sup>

*/RA/*

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Lawrence G. McDade, Chairman  
ADMINISTRATIVE JUDGE

*/RA, by Edward R. Hawkens for/*

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Dr. Kaye D. Lathrop  
ADMINISTRATIVE JUDGE

*/RA, by Edward R. Hawkens for/*

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Dr. Richard E. Wardwell  
ADMINISTRATIVE JUDGE

Rockville, Maryland  
November 4, 2010

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<sup>120</sup> Copies of this Order were sent this date by Internet e-mail to: (1) Counsel for the NRC Staff; (2) Counsel for Entergy; (3) Counsel for the State of New York; (4) Counsel for Riverkeeper, Inc.; (5) Manna Jo Green, the Representative for Clearwater; (6) Counsel for the State of Connecticut; (7) Counsel for Westchester County; (8) Counsel for the Town of Cortlandt; (9) Mayor Sean Murray, the Representative for the Village of Buchanan; and (10) Counsel for the New York City Economic Development Corporation.

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing MEMORANDUM AND ORDER (Ruling on Entergy's Motion for Summary Disposition of Riverkeeper TC-2 (Flow-Accelerated Corrosion)) have been served upon the following persons by U.S. mail, first class, or through NRC internal distribution.

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Docket Nos. 50-247-LR and 50-286-LR  
MEMORANDUM AND ORDER MEMORANDUM AND ORDER (Ruling on Entergy's Motion for  
Summary Disposition of Riverkeeper TC-2 (Flow-Accelerated Corrosion))

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Docket Nos. 50-247-LR and 50-286-LR  
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Docket Nos. 50-247-LR and 50-286-LR  
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[Original signed by Christine M. Pierpoint]  
Office of the Secretary of the Commission

Dated at Rockville, Maryland  
this 4<sup>th</sup> day of November, 2010.