

**UNITED STATES OF AMERICA
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD**

In the Matter of)	Docket Nos. 50-247-LR and
ENTERGY NUCLEAR OPERATIONS, INC.)	50-286-LR
(Indian Point Nuclear Generating Units 2 and 3))	
	May 3, 2013

**ENTERGY’S REPLY TO NEW YORK STATE FINDINGS OF FACT AND
CONCLUSIONS OF LAW FOR CONTENTIONS NYS-6 AND NYS-7
(NON-ENVIRONMENTALLY QUALIFIED INACCESSIBLE MEDIUM-
AND LOW-VOLTAGE CABLES)**

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Pursuant to the Atomic Safety and Licensing Board’s (“Board”) February 28, 2013 Order,¹ Entergy Nuclear Operations, Inc. (“Entergy”) submits its Reply to New York State’s (“New York”) Findings of Fact and Conclusions of Law on Contentions NYS-6 and NYS-7 (together, “NYS-6/7”). These Reply Findings and Conclusions are based on the evidentiary record in this proceeding and are set out in numbered paragraphs, with corresponding citations to the record of this proceeding.

I. INTRODUCTION

1. On March 22, 2013, Entergy, the U.S. Nuclear Regulatory Commission (“NRC” or “Commission”) Staff, and New York filed proposed findings of fact and conclusions of law on Contention NYS-6/7, which alleges that Entergy lacks adequate aging management programs (“AMPs”) for non-environmentally-qualified (“EQ”) inaccessible medium-voltage and low-voltage cables at the Indian Point Energy Center (“IPEC”).² This contention involves two IPEC

¹ Licensing Board Order (Granting Parties Joint Motion for Alteration of Filing Schedule) at 1 (Feb. 28, 2013) (unpublished).

² Entergy’s Proposed Findings of Fact and Conclusions of Law for Contentions NYS-6 and NYS-7 (Non-Environmentally Qualified Inaccessible Medium- and Low-Voltage Cables) (Mar. 22, 2013) (“Entergy

AMPs in particular – the Non-EQ Inaccessible Medium-Voltage Cable Program (“Inaccessible Cable Program”) and the Non-EQ Insulated Cables and Connections Program (“Cables and Connections Program”).

2. It is apparent from the parties’ proposed findings that several key issues are not in dispute and that the number of remaining disputed issues for this contention has decreased as this proceeding has progressed – even since the conclusion of the evidentiary hearing on this contention on December 12, 2012. For instance, there is no disagreement among the parties that: (1) Entergy’s description of the Inaccessible Cable Program in the IPEC license renewal application (“LRA”) is consistent with the relevant “GALL Report”³ AMP description;⁴ (2) Entergy will adequately manage the aging effects caused by exposure to significant moisture if it follows its procedure for implementing the Inaccessible Cable Program, EN-DC-346, “Cable Reliability Program”;⁵ and (3) Entergy has provided procedures that will adequately manage, from a technical perspective, the aging effects on cables caused by heat exposure.⁶

3. With respect to those issues that remain in dispute, however, New York’s Proposed Findings make broad assertions that lack evidentiary support, fail to acknowledge contrary testimony or evidence, mischaracterize the record, and raise a new (unsupported)

Proposed Findings”), *available at* ADAMS Accession No. ML13081A741; The State of New York’s Proposed Findings of Fact and Conclusions of Law as to Consolidated Contention NYS-6/7 (Mar. 22, 2013) (“New York Proposed Findings”), *available at* ADAMS Accession No. ML13081A767; NRC Staff’s Proposed Findings of Fact and Conclusions of Law Part 3: Contention NYS-6/7 (Non-EQ Inaccessible Medium and Low Voltage Cables) (Mar. 22, 2013) (“NRC Staff Proposed Findings”), *available at* ADAMS Accession No. ML13081A749.

³ NUREG-1801, Rev. 2, Generic Aging Lessons Learned (GALL) Report (Dec. 2010) (“GALL Report, Rev. 2”) (NYS00147A-D)).

⁴ Entergy Proposed Findings at 39 (¶ 84); NRC Staff Proposed Findings at 21 (¶ 3.76).

⁵ Entergy Proposed Findings at 42 (¶ 95); NRC Staff Proposed Findings at 23 (¶ 3.83); Pre-filed Written Rebuttal Testimony of Earle C. Bascom III Regarding Contentions NYS-6 and NYS-7 at 2:11-13 (June 29, 2012) (“New York Rebuttal Testimony”) (NYS000411).

⁶ Entergy Proposed Findings at 54-57 (¶¶ 124-30); NRC Staff Proposed Findings at 26 (¶¶ 3.104-3.105); New York Proposed Findings at 33-34 (¶¶ 110-114) (providing no criticisms of or evidence contrary to Entergy testimony).

challenge to one of Entergy’s AMPs. For example, New York’s central argument is that “Entergy’s witnesses testified that the [Inaccessible Cable Program] is only sufficient if implemented in accordance with Entergy’s implementing procedures.”⁷ As discussed below, as an initial matter, New York did not provide any citations to the record to support that broad statement. Presumably, New York is relying upon the testimony of Entergy witnesses Howard Sedding and Alan Cox discussed elsewhere in its Proposed Findings, but that testimony does not support New York’s key argument. Indeed, New York not only mischaracterizes Dr. Sedding’s and Mr. Cox’s testimony but also ignores Entergy and NRC Staff testimony that is directly contrary to the findings it has proposed to the Board. In fact, Entergy’s witnesses provided compelling testimony that the AMP was sufficient on its own to provide reasonable assurance that the relevant cables will continue to perform their intended functions during the period of extended operation (“PEO”).⁸

4. Commission precedent in other license renewal proceedings⁹ also supports a conclusion that the Inaccessible Cable Program – by itself – provides reasonable assurance that Entergy will manage aging effects on all non-EQ inaccessible low- and medium-voltage cables during the PEO. Although it is unnecessary for the Board to reach beyond that finding in light of *Oyster Creek*, *Vermont Yankee*, and *Seabrook*, the evidence nonetheless shows that the IPEC LRA is sufficiently linked with the essential elements of procedure EN-DC-346, “Cable

⁷ New York Proposed Findings at 1 (¶ 3); *see also id.* at 46 (¶ 158) (“Entergy’s witnesses testified that implementing procedures for its Aging Management Program for inaccessible low-voltage and medium-voltage cables that are wetted or submerged are needed in order for Entergy to meet its license renewal commitments and be in compliance with the GALL Report Revision 2.”).

⁸ *See generally* Testimony of Entergy Witnesses Alan B. Cox, Roger B. Rucker, Thomas S. McCaffrey, and Howard G. Sedding Concerning Contentions NYS-6/NYS-7 (Non-EQ Inaccessible Medium- and Low-Voltage Cables) at 60-73 (A98-A120) (Sept. 21, 2012) (“Entergy Testimony”) (ENTR00233).

⁹ *See AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), CLI-08-23, 68 NRC 461, 468 (2008); *Entergy Nuclear Vermont Yankee, LLC* (Vermont Yankee Nuclear Power Station), CLI-10-17, 72 NRC 1 (2010); *NextEra Energy Seabrook, LLC* (Seabrook Station, Unit 2), CLI-12-05, 75 NRC __ (Mar. 8, 2012).

Reliability Program” (“EN-DC-346”)¹⁰ and that the procedure provides a sufficient level of detail on how Entergy will implement the AMP in the PEO. Specifically, Entergy has committed to implement the essential elements of EN-DC-346,¹¹ and those commitments are binding and enforceable. Therefore, Entergy’s AMP, together with its license renewal commitments, provide reasonable assurance that Entergy will adequately manage aging effects on all non-EQ inaccessible low- and medium-voltage cables during the PEO.

5. Further, the record shows – and the parties agree – that thermal stress caused by “ohmic” heating or mutual heating of inaccessible below-grade cables is not an aging management concern at IPEC, because the cables at issue were appropriately designed to minimize the potential for unacceptable heating.¹² However, even if such heating were to occur, there is reasonable assurance that Entergy’s cable testing program will detect resulting heat-related degradation long before cable failure.¹³ New York’s remaining concerns with respect to heat-related degradation¹⁴ are unsupported by any testimony, regulation, or legal authority. They are also either beyond the scope of license renewal or already addressed in the Inaccessible Cable Program.¹⁵ Accordingly, IPEC’s Inaccessible Cable Program provides reasonable assurance that Entergy will adequately manage the effects of aging due to thermal stress on all below-ground cables within the scope of the program.

¹⁰ Entergy Proposed Findings at 40-41 (¶¶ 90-91); EN-DC-346, Rev. 3, Cable Reliability Program (Apr. 30, 2012) (“EN-DC-346”) (ENT000583).

¹¹ Entergy Proposed Findings at 41 (¶ 91).

¹² *Id.* at 54-56 (¶¶ 124-27); NRC Staff Proposed Findings at 25 (¶¶ 3.94-3.99); New York Proposed Findings at 33-34 (¶¶ 111-12).

¹³ Entergy Proposed Findings at 56-57 (¶¶ 129-30); NRC Staff Proposed Findings at 26 (¶ 3.101); New York Proposed Findings at 34 (¶ 114).

¹⁴ New York contends that, because Entergy has not incorporated the representations made by its witnesses at hearing into an enforceable and detailed proposed AMP for inaccessible cables, Entergy’s AMP does not provide reasonable assurance that the IPEC current licensing basis will be maintained throughout the PEO. New York Proposed Findings at 47 (¶ 159).

¹⁵ Entergy Proposed Findings at 50-51 (¶ 117).

6. In addition, the record shows that Entergy has made appropriate commitments regarding the Inaccessible Cable Program as part of the LRA process¹⁶ and that the NRC Staff has appropriate existing processes to ensure that Entergy complies with its commitments and internal procedures, including audits, inspections, and potential enforcement actions.¹⁷ Moreover, any modifications that Entergy makes to its procedures are subject to a rigorous internal review process, as well as NRC oversight.¹⁸ Consequently, Entergy and the NRC Staff have sufficient existing procedural and regulatory processes in place to ensure that Entergy will comply with its Inaccessible Cable Program commitments during the PEO.

7. Finally, the record provides no support for New York's challenge – raised in its Proposed Findings for the first time in the adjudication of this contention – to the treatment of above-ground inaccessible cables within the scope of the IPEC Cables and Connections Program.¹⁹ Indeed, at the hearing, New York's own expert expressly declined to offer any opinions regarding above-ground cables.²⁰ The record shows that the Cables and Connections Program provides reasonable assurance that Entergy will adequately manage aging effects on all above-ground medium- and low-voltage cables within the scope of the program.²¹

8. For the reasons discussed below and in Entergy's Proposed Findings, Entergy has carried its burden of proof to demonstrate that it has taken actions necessary to provide reasonable assurance that the effects of aging will be managed for non-EQ inaccessible low- and

¹⁶ *Id.* at 50-51 (¶ 117).

¹⁷ *Id.* at 61-62 (¶¶ 141-43).

¹⁸ *Id.* at 62-66 (¶¶ 144-52).

¹⁹ New York Proposed Findings at 44 (¶ 152).

²⁰ Official Transcript of Proceedings, Indian Point Nuclear Generating Units 2 & 3 at 4103:18-21 (Bascom) (Dec. 12, 2012) (“Dec. 12, 2012 Tr.”) (“I had no basis to evaluate or assume that there would be an issue with the above ground cables that were inaccessible from that standpoint.”).

²¹ *See* Entergy Proposed Findings at 67-68 (¶¶ 154-58).

medium-voltage cables during the PEO. Nothing in New York's Proposed Findings alters this fundamental conclusion. The Board should therefore resolve NYS-6/7 in favor of Entergy.

II. REPLY TO NEW YORK'S FACTUAL FINDINGS AND LEGAL CONCLUSIONS

A. Issues Not Disputed by New York

9. As noted above, the number of issues that remains in dispute for this contention has decreased as this proceeding has progressed. Since the submission of its initial position statement and initial pre-filed expert testimony in December 2011, New York has made several substantive concessions regarding Entergy's AMPs, and there are several areas of agreement among the parties, which are discussed below.

1. The Parties' Witnesses Are Qualified

10. As an initial matter, New York does not challenge the qualifications of any of the witnesses who testified on behalf of Entergy and the NRC Staff.²² Nor do Entergy and the Staff challenge the qualifications of the other parties' respective witnesses.²³

11. Accordingly, the Board should find that all seven of the witnesses offered by the parties on this contention – Entergy witnesses Alan B. Cox, Thomas S. McCaffrey, Roger B. Rucker, and Howard G. Sedding; Staff witnesses Clifford K. Doult and Duc T. Nguyen; and New York witness Earle C. Bascom, III – are qualified to testify as expert witnesses relative to the issues raised in NYS-6/7.

2. There Have Been No Age-Related Cable Failures at IPEC

12. It should also be noted at the outset that the parties agree that IPEC has not experienced any cable failures due to aging caused by exposure to moisture or heat.²⁴ It is true,

²² See generally New York Proposed Findings at 21-23 (¶¶ 65-72).

²³ See generally Entergy Proposed Findings at 23-24 (¶¶ 73, 76); NRC Staff Proposed Findings at 9-11 (¶¶ 3.28-3.33).

as New York points out, that Indian Point Unit 3 has experienced two cable failures,²⁵ but those were due to mechanical damage to the cables, and not the effects of aging.²⁶ Similarly, a cable at Unit 2 also failed due to mechanical damage.²⁷ New York does not dispute the testimony or evidence on this point.

13. Accordingly, the Board should conclude that, to date, there have been no failures of medium- or low-voltage power cables due to the effects of aging caused by moisture or heat at IPEC.

3. The Inaccessible Cable Program Described in the IPEC LRA is Consistent with the Relevant GALL Report AMP

14. New York does not dispute that Entergy's description of the Inaccessible Cable Program in the LRA is consistent with the relevant GALL Report AMP description. As Mr. Cox and Mr. Rucker testified, Entergy followed the GALL Report guidance in preparing Section B.1.23 of the IPEC LRA, which describes the Inaccessible Cable Program.²⁸ In its LRA, Entergy committed to implement its new Inaccessible Cable Program in accordance with the corresponding AMP described in Section XI.E3 of the GALL Report without exception.²⁹

15. In addition, as noted in the Staff's Proposed Findings, Mr. Doutt and Mr. Nguyen testified that the NRC Staff "did not simply take the applicant at its word," but rather, the Staff

²⁴ Dec. 12, 2012 Tr. at 4104:16-19 (McCaffrey) ("Our operating experience from the site here is we have seen no degradation or failures on our medium voltage cables or our underground cables due to aging."); *see also* NL-07-055, Letter from Fred Dacimo, Site Vice President, IPEC, to NRC Document Control Desk, "Submittal of Indian Point Response to Generic Letter 2007-01 at Attach. 1 (May 7, 2007) (ENT000236); Entergy License Renewal Application, IPEC, App. B at B-81 ("LRA") (ENT00015B).

²⁵ New York Proposed Findings at 11 (¶ 34).

²⁶ Testimony of Entergy Witnesses Alan B. Cox, Roger B. Rucker, Thomas S. McCaffrey, and Howard G. Sedding Concerning Contentions NYS-6/NYS-7 (Non-EQ Inaccessible Medium- and Low-Voltage Cables) at 41 (A68) (Sept. 21, 2012) ("Entergy Testimony") (ENTR00233).

²⁷ *Id.* at 41 (A69).

²⁸ *Id.* at 34 (A55); LRA at B-81 (ENT00015B).

²⁹ LRA at B-81 (ENT00015B).

performed a detailed, independent review of Entergy’s Inaccessible Cable Program and the commitments described in LRA Section B.1.23.³⁰ Following a thorough audit and RAI process, the NRC Staff verified through record reviews and questioning of Entergy personnel that the Inaccessible Cable Program elements were consistent with all ten corresponding GALL Report, Rev. 1,³¹ Section XI.E3 program elements.³² After Entergy revised the Inaccessible Cable Program to include low-voltage cables and other program enhancements, the NRC Staff reviewed the revised program and concluded that it was consistent with the AMP described in Section XI.E3 of Revision 2 of the GALL Report.³³ Based on the program’s consistency with the corresponding GALL Report program, the Staff concluded that Entergy had demonstrated that the effects of aging will be adequately managed so that the intended functions of the cables within the scope of the Inaccessible Cable Program will be maintained consistent with the current licensing basis (“CLB”) for the PEO.³⁴

16. In its Proposed Findings, New York does not identify any contrary testimony or evidence or assert any contrary arguments. Accordingly, because there is no disagreement among the parties on this point, the Board should find, as an initial matter, that the IPEC Inaccessible Cable Program described in LRA Section B.1.23 is consistent with the AMP described in GALL Report, Rev. 1, Section XI.E3 and that Entergy’s expanded Inaccessible Cable Program meets the intent of Section XI.E3 of the GALL Report, Rev. 2.

³⁰ NRC Proposed Findings at 21-22 (¶¶ 3.76-3.80); NRC Staff Testimony of Cliff Doutt and Duc Nguyen Concerning NYS Contention 6 and 7 (Lack of a Specific Plan for the Aging Management of Non-Environmentally-Qualified Inaccessible Medium and Low-Voltage Cable and Wiring) at 13 (A14) (Mar. 30, 2012) (“NRC Staff Testimony”) (NRC000077).

³¹ NUREG-1801, Rev. 1, Generic Aging Lessons Learned (GALL) Report (Sept. 2005) (“GALL Report, Rev. 1”) (NYS00146A-C”).

³² NRC Staff Testimony at 14-15 (A14) (NRC000077).

³³ *Id.* at 5-6 (A4).

³⁴ *Id.*; NUREG-1930, Vol. 1, Safety Evaluation Report Related to the License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3 at 3-31 to -33 (NYS00326B).

4. Exposure to Moisture Is Not a Relevant Cause of Cable Degradation at IPEC

17. Although New York proposes several findings related to cable degradation caused by exposure to moisture (or “water treeing”)³⁵ the parties do not dispute that water treeing is not a concern for IPEC’s cables.³⁶ As Entergy witnesses Mr. Cox, Mr. Rucker, and Mr. McCaffrey explained, nearly all of the below-ground low- and medium-voltage cables that are within the scope of this contention are lead-sheathed, which means that the probability of cable insulation deterioration due to moisture exposure in these cables is very low.³⁷ This is because lead sheathing acts as a barrier for water intrusion into the cables.³⁸

18. At the hearing, Mr. Bascom agreed that the below-ground non-EQ cables at IPEC were lead-sheathed, which he acknowledged acted as a “hermetic seal that prevents moisture from getting into the cables.”³⁹ In response to Board questioning, Mr. Bascom indicated that he had no concerns regarding moisture-related cable degradation at IPEC.⁴⁰

19. Accordingly, the Board should find that below-ground cable degradation caused by exposure to moisture is not a concern that is relevant to IPEC’s cables.

5. Entergy Will Adequately Manage Any Moisture-Related Aging Effects That May Occur Via Adherence to EN-DC-346

20. The parties agree that Entergy will adequately manage the aging effects caused by exposure to significant moisture – in the unlikely event that it occurs – if Entergy follows the Inaccessible Cable Program implementing procedure (*i.e.*, EN-DC-346, “Cable Reliability

³⁵ See New York Proposed Findings at 27-28 (¶¶ 86-89).

³⁶ Entergy Proposed Findings at 42 (¶¶ 94-95); Dec. 12, 2012 Tr. at 4172:10-14 (Bascom).

³⁷ Entergy Testimony at 62-63 (A101-02) (ENTR00233).

³⁸ Dec. 12, 2012 Tr. at 4169:1-3 (McCaffrey) (“Lead sheaths are in addition, another barrier we would have for cables, for water intrusion into our cables.”).

³⁹ *Id.* at 4172:10-14 (Bascom).

⁴⁰ *Id.* at 4172:22-4173:3 (Bascom) (“[T]he lead sheath would prevent moisture from getting into the cables.”).

Program.”)⁴¹ Mr. Bascom testified, without qualification, that, “[i]n [his] opinion, the Cable Reliability Program, if followed, will adequately manage the effects of aging caused by the exposure of these cables to significant moisture.”⁴² New York acknowledges Mr. Bascom’s testimony in its Proposed Findings.⁴³

21. Consistent with the findings proposed by Entergy and the Staff, New York concedes that:

The Cable Reliability Program (and its attachments) identifies and describes the in-scope inaccessible underground low-voltage and medium-voltage cables, selects appropriate cable condition monitoring tests for shielded and unshielded low- and medium-voltage cables, provides instructions for performing the tests, identifies test acceptance criteria for the selected cable condition monitoring tests, and describes corrective actions for cables that do not meet the test acceptance criteria.⁴⁴

22. In addition, as noted by New York, EN-DC-346 “directs Entergy’s employees at each of Entergy[’s] nuclear facilities to create a cable risk factor associated with each cable based on criticality, adverse environment, service life, ampacity, splices, and the results of testing and inspection, in order to set priorities for testing and replacement.”⁴⁵ EN-DC-346 also:

identifies all manholes containing medium- and low-voltage power cables as within the scope of license renewal, requires the installation of sump pumps wherever practical in manholes, vaults and duct systems containing cables that

⁴¹ See NRC Staff Proposed Findings at 23 (¶ 3.83) (“Entergy’s AMP to address non-EQ inaccessible power cables is sufficient to assure proper aging management with respect to moisture. The LRA committed to develop such a program, and Entergy has done just that by adopting its Cable Reliability Program EN-DC-346.”); New York Proposed Findings at 37 (¶ 126); Entergy Proposed Findings at 66-67 (¶ 153).

⁴² New York Rebuttal Testimony at 2:11-13 (NYS000411).

⁴³ New York Proposed Findings at 37 (¶ 126).

⁴⁴ *Id.* at 36 (¶ 122); see also Entergy Proposed Findings at 51 (¶ 119); NRC Staff Proposed Findings at 14 (¶ 3.43).

⁴⁵ New York Proposed Findings at 36 (¶ 122); see also Entergy Proposed Findings at 51 (¶ 119); NRC Staff Proposed Findings at 14 (¶ 3.43).

have the potential for submergence, and requires the adjustment of the intervals of manual inspection and pumping sufficient to keep the cables dry.⁴⁶

23. In addition, New York no longer suggests that Entergy will not have sufficient time to test all cables within the scope of the Inaccessible Cable Program before the expiration of the IPEC Unit 2 (“IP2”) operating licenses in September 2013.⁴⁷ Entergy witnesses Mr. Cox, Mr. Rucker, and Mr. McCaffrey testified that Entergy will have sufficient time to complete testing of all cables within the scope of the Inaccessible Cable Program before the expiration of the IP2 operating license in September 2013.⁴⁸ Mr. McCaffrey confirmed that Entergy has completed testing for the low-voltage cables within the scope of the program and is on track to complete testing of the in-scope medium-voltage cables in the first half of 2013.⁴⁹ New York’s Proposed Findings do not identify any testimony or evidence to counter Entergy’s testimony on this point.

24. In short, New York’s Proposed Findings discuss the details contained in EN-DC-346 and offer no testimony or evidence critical of any technical aspect of the procedure. Consequently, the Board should find that procedure EN-DC-346 provides a sufficient level of detail on how Entergy will implement the Inaccessible Cable Program in the PEO and that Entergy will adequately manage the aging effects caused by exposure to significant moisture.

6. Entergy Will Adequately Manage Heat-Related Aging Effects, Should They Occur in the Future

25. During the December 12, 2012 hearing on NYS-6/7, the Board heard a substantial amount of testimony regarding Entergy’s ability to adequately manage the aging effects on

⁴⁶ New York Proposed Findings at 36 (¶ 123); *see also* Entergy Proposed Findings at 43-44 (¶ 98); NRC Staff Proposed Findings at 16 (¶ 3.49).

⁴⁷ *Cf.* Prefiled Written Testimony of Earle C. Bascom III Regarding Contentions NYS-6 and 7 at 25:16-26:1 (Dec. 15, 2011) (NYS000136).

⁴⁸ Entergy Testimony at 72-73 (A120) (ENTR00233).

⁴⁹ Dec. 12, 2012 Tr. at 4086:21-4087:2 (McCaffrey).

below-ground cables caused by thermal stress.⁵⁰ In support of New York’s assertion that Entergy lacks an AMP that adequately manages such aging effects,⁵¹ Mr. Bascom testified that, if a cable is exposed to elevated temperatures over an extended period of time, cable aging could be accelerated, and Entergy has not identified any processes to determine whether any cables at IPEC are exposed to elevated temperatures.⁵² Mr. Bascom further asserted that Entergy should be required to monitor cable temperatures to identify “hot spots,” or conditions that result in an elevated temperature along the cable, prior to any degradation occurring.⁵³ According to Mr. Bascom, hot spots can be caused not only by external heat sources but also by internal ohmic heating of the cables themselves.⁵⁴ Mr. Bascom identified the installation of thermocouples that measure temperature at particular points or fiber optic cables that measure temperatures along the length of below-grade cables as recommended methods to identify hot spots.⁵⁵

26. As summarized in Entergy’s Proposed Findings, Entergy and the NRC Staff offered persuasive testimony to counter each of Mr. Bascom’s assertions.⁵⁶ For example, Entergy witnesses Mr. Rucker and Dr. Sedding testified that, contrary to New York’s assertion, below-grade cables that are potentially exposed to thermal stress are managed through the Inaccessible Cable Program, as implemented by EN-DC-346.⁵⁷ In addition, both Entergy and NRC Staff witnesses, including Dr. Sedding and Mr. Nguyen, offered testimony indicating that

⁵⁰ See generally *id.* at 4096-4163 (Bascom, Sedding, McCaffrey, Doult, and Nguyen).

⁵¹ See State of New York’s Revised Statement of Position Regarding Contentions NYS-6 and NYS-7 at 7 (June 29, 2012) (NYS000410).

⁵² Dec. 12, 2012 Tr. at 4111:14-21 (Bascom).

⁵³ *Id.* at 4109:2-4, 4112:4-9 (Bascom).

⁵⁴ *Id.* at 4109:9-19 (Bascom).

⁵⁵ *Id.* at 4106:17-4107:2 (Bascom).

⁵⁶ See generally, Entergy’s Proposed Findings at 56-62 (¶¶ 130-43); Dec. 12, 2012 Tr. at 4147:18-4152:5 (Nguyen).

⁵⁷ Entergy Testimony at 78 (A125) (ENTR00233).

heat-related insulation degradation related to external heat sources or ohmic heating is not a cause for concern for the cables at issue in this contention, because IPEC's cables were appropriately designed to minimize the potential for hot spots caused by either external heat sources or ohmic heating.⁵⁸ Dr. Sedding, Mr. McCaffrey, Mr. Rucker, and Mr. Nguyen further testified that, if heat-related degradation were to occur, it would be detected by Entergy's cable testing program.⁵⁹ Finally, Mr. Rucker testified that he was unaware of any nuclear power plant that had retrofitted its below-grade cables with fiber optic cables, thermocouples, or other temperature monitoring devices.⁶⁰ Due to the potential for mechanical damage to the cables during the retrofit process, Mr. McCaffrey and Dr. Sedding both testified that a retrofit may not be feasible or practical at nuclear power plants such as IPEC.⁶¹

27. It is apparent from New York's Proposed Findings that New York and Mr. Bascom no longer assert any technical challenges to Entergy's ability to manage heat-related aging effects. Specifically, in its Proposed Findings, New York acknowledges Entergy witness testimony on the following four key points: (1) there are no external heat sources at IPEC, and the only potential source of heat would be the cables themselves;⁶² (2) IPEC cable systems were designed to take into account the soil's thermal resistance, the number of cables running in a conduit, and the load on each cable,⁶³ and therefore, were designed to avoid the ohmic heating

⁵⁸ Dec. 12, 2012 Tr. at 4116:12-16 (Sedding); *id.* at 4147:18-4152:5 (Nguyen); *see also* Entergy Proposed Findings at 58-60 (¶¶ 132-36).

⁵⁹ Dec. 12, 2012 Tr. at 4127:11-4129:23 (Sedding); *id.* at 4151:12-16 (Nguyen); *id.* at 4104:22-4105:1, 4125:5-6, 4138:18-22 (McCaffrey); Entergy Testimony at 78 (A125) (ENTR00233); *see generally*, Entergy Proposed Findings at 60-61 (¶¶ 137-39).

⁶⁰ Dec. 12, 2012 Tr. at 4192:10-23 (Rucker) ("I'm not aware of any nuclear plant doing a retrofit, to add a monitoring process like [fiber optic cables or thermocouples].").

⁶¹ *Id.* at 4156:8-4157:7 (Sedding) (discussing logistical difficulties and potential for mechanical damage to cables in installing retrofit equipment); *id.* at 4193:6-25 (McCaffrey) (same).

⁶² New York Proposed Findings at 33 (¶ 111) (citing Dec. 12, 2012 Tr. at 4105:2-6, 18-20 (McCaffrey)).

⁶³ *Id.* at 34 (¶ 112) (citing Dec. 12, 2012 Tr. at 4104:6-15, 4108:4-15 (McCaffrey)).

that can occur when heat cannot dissipate in the surrounding environment or the mutual heating effect from cables that are in too close proximity to one another;⁶⁴ (3) if Entergy made changes to the plant or to the plant's electrical systems and components, Entergy would reevaluate the design calculations to verify that the modifications would not invalidate the temperature requirements for the cable;⁶⁵ and (4) testing of the cable insulation for moisture damage would also detect any heat-related degradation.⁶⁶ Mr. Bascom did not offer any contrary testimony on these four points; nor did New York identify any contrary testimony or evidence in its Proposed Findings.⁶⁷

28. New York also does not dispute other Entergy and NRC Staff testimony related to heat degradation. For example, it does not dispute Mr. McCaffrey's testimony that there is no indication that IPEC cables have experienced any heat-related degradation due to ohmic heating.⁶⁸ In addition, New York no longer asserts in its Proposed Findings (notwithstanding Mr. Bascom's hearing testimony⁶⁹) that Entergy should retrofit its cables with temperature-monitoring devices, such as fiber optic cables or thermocouples. In short, New York no longer challenges Entergy's ability to manage the aging effects on cables caused by heat exposure as a technical matter.

⁶⁴ *Id.*

⁶⁵ *Id.* at 34 (¶ 113) (citing Dec. 12, 2012 Tr. at 4136:1-12 (McCaffrey)). If, for example, a proposed modification did not meet the original plant design requirements, Entergy would change the cable size, reroute the cable, or take other steps to meet the original design requirements. *Id.* (citing Dec. 12, 2012 Tr. at 4146:2-22 (McCaffrey)).

⁶⁶ *Id.* at 34 (¶ 114) (citing Dec. 12, 2012 Tr. at 4104:22-4105:1 (McCaffrey); *id.* at 4112:4-6 (Bascom)).

⁶⁷ *See id.* at 33-34 (¶¶ 111-14).

⁶⁸ Dec. 12, 2012 Tr. at 4104:16-19 (McCaffrey) ("Our operating experience from the site here is we have seen no degradation or failures on our medium voltage cables or our underground cables due to aging."); *id.* at 4115:25-4116:2 (McCaffrey) ("For Indian Point I know of no history of ohmic heating that has caused degradation of the cables.").

⁶⁹ *Id.* at 4106:17-4107:2 (Bascom).

29. Based on the record evidence, the Board should conclude that the non-EQ low- and medium-voltage cables installed below-ground at IPEC were properly designed to minimize the potential for insulation degradation caused by ohmic heating. In addition, the Board should find that Entergy's EN-DC-346 cable testing program would detect thermal-related degradation caused by operating a cable at temperatures above a cable's manufacturer rating, design rating, and operating temperature for an extended period of time.⁷⁰

B. IPEC's Inaccessible Cable Program and Entergy's License Renewal Commitments Provide the Requisite Reasonable Assurance That the Affected Cables Will Perform Their Intended Function During the PEO

30. As discussed above, there is no dispute among the parties that: (1) the LRA's description of the Inaccessible Cable Program is consistent with the relevant GALL Report AMP; (2) procedure EN-DC-346 provides a sufficient level of detail on how Entergy will implement the Inaccessible Cable Program in the PEO; and (3) Entergy will adequately manage the aging effects caused by exposure to significant moisture if it adheres to EN-DC-346.⁷¹ Thus, as identified in the parties' proposed findings, what remains in dispute is: (1) whether Entergy's AMP is required to include the level of detail suggested by New York;⁷² (2) whether Entergy's witnesses testified that the Inaccessible Cable Program is insufficient to support a finding of reasonable assurance with respect to IPEC's license renewal;⁷³ (3) whether the essential elements of EN-DC-346 have been incorporated as binding and enforceable license renewal

⁷⁰ Notwithstanding its concession concerning Entergy's technical ability to manage heat-related aging effects, New York still challenges Entergy's management of such issues from a legal standpoint. This argument is addressed below in Section II.E.

⁷¹ See *supra* Sections II.A.3 and II.A.5.

⁷² Compare New York Proposed Findings at 29-31 (¶¶ 93-102) with Entergy Testimony at 57 (A95) (ENTR00233).

⁷³ Compare New York Proposed Findings at 37-38 (¶¶ 124-29) with Entergy Testimony at 43-46 (A72) (ENTR00233).

commitments;⁷⁴ and (4) whether the Staff must review EN-DC-346 to determine whether it effectively implements the AMP or is in compliance with the GALL Report.⁷⁵ Each of these remaining issues is discussed below.

1. **NRC Regulations and Guidance Do Not Require Entergy to Provide an AMP with the Level of Detail Asserted by New York**

31. Repeating arguments made in its initial testimony and position statement, New York continues to assert that Entergy's Inaccessible Cable Program is missing necessary information about the characteristics of the cables that will be tested and does not specify the testing method, acceptance criteria, or whether trendable tests will be chosen.⁷⁶

32. As noted in Entergy's Proposed Findings, Entergy witnesses Mr. Cox and Mr. Rucker testified that neither the NRC's regulations nor NRC guidance require or recommend the level of detail sought in the Inaccessible Cable Program by New York.⁷⁷ New York does not identify precedent, regulations, or guidance to the contrary. This is to be expected, given that the level of detail provided in the IPEC Inaccessible Cable Program is consistent with that of Section XI.E3 of the GALL Report – which, as the Commission has noted, is “a guidance document that was prepared at our behest and that we have cited with approval.”⁷⁸ In addition, NRC Staff witnesses Mr. Doutt and Mr. Nguyen testified at length about why such details are not required

⁷⁴ Compare New York Proposed Findings at 37-38 (¶¶ 124-29) with Entergy Proposed Findings at 50-51 (¶ 117).

⁷⁵ Compare New York Proposed Findings at 38-39 (¶¶ 130-35) with Entergy Proposed Findings at 60-67 (¶¶ 137-153).

⁷⁶ New York Proposed Findings at 30-31 (¶¶ 97-102). Citing to the 2007 IPEC LRA, New York states that Entergy's “current” Inaccessible Cable Program is “a little over one page in length.” *Id.* at 29 (¶ 93). On the other hand, New York also notes in its Proposed Findings that Entergy has twice amended its Inaccessible Cable Program since it filed its LRA in 2007, and Entergy's August 9, 2011 RAI response “replaces the program description of the initial proposed AMP that was contained in the 2007 License Renewal Application.” *Id.* at 28 (¶ 90). In any event, the NRC Staff's Supplemental SER provides a comprehensive description of the original Inaccessible Cable Program and its subsequent enhancements. See NUREG-1930, Supp. 1, Safety Evaluation Report Related to the License Renewal of Indian Point Nuclear Generating Unit Nos. 2 and 3 at 3-5 to 3-9 (“Supplemental SER”) (NYS000160).

⁷⁷ Entergy Testimony at 57 (A95) (ENTR00233).

⁷⁸ *Vermont Yankee*, CLI-10-17, 72 NRC at 37 (citing *Oyster Creek*, CLI-08-28, 68 NRC at 468).

for the Staff to make a technical judgment on the technical merits of the AMP.⁷⁹ For example, Mr. Doust and Mr. Nguyen explained that it was unnecessary to include details regarding the cable length, voltage class, or cable type within the Inaccessible Cable Program, because Entergy had elected to manage the aging of its cables as a “commodity” group, rather than as individual cables.⁸⁰ Under this commodity group approach, such details are not needed, for example, for selection of a specific cable testing technique.⁸¹ As the Staff witnesses explained, the GALL Report permits a licensee using the commodity group approach to select a “state of the art” test.⁸²

33. New York’s Proposed Findings do not, however, acknowledge (much less address or counter) Entergy and NRC Staff testimony on this point. Accordingly, the Board should find that NRC regulations do not require Entergy to provide the level of detail sought by New York in its Inaccessible Cable Program.

2. Entergy Witnesses Testified that IPEC’s Inaccessible Cable Program Is Sufficient On Its Own to Provide Reasonable Assurance

34. New York asserts in its Proposed Findings that the Inaccessible Cable Program – by itself – is insufficient to support IPEC license renewal because EN-DC-346’s provisions are not incorporated into the AMP.⁸³ However, New York bases its argument on an inaccurate characterization of Entergy’s witness testimony. More to the point, New York incorrectly characterizes Entergy witness testimony as a *concession* that the Inaccessible Cable Program, on its own, is inadequate as an AMP.⁸⁴

⁷⁹ See NRC Staff Testimony at 17-25 (A18-A28) (NRC000077).

⁸⁰ *Id.* at 20-23 (A23-A26).

⁸¹ *Id.*

⁸² *Id.*

⁸³ New York Proposed Findings at 37-38 (¶¶ 124-29).

⁸⁴ *Id.*

35. Specifically, New York states in its Proposed Findings that “Entergy’s witnesses testified that implementing procedures for its Aging Management Program for inaccessible low-voltage and medium-voltage cables that are wetted or submerged are needed in order for Entergy to meet its license renewal commitments and be in compliance with the GALL Report Revision 2.”⁸⁵ Similarly, New York claims that “Entergy’s witnesses testified that the proposed aging management program is only sufficient if implemented in accordance with Entergy’s implementing procedures.”⁸⁶ But because New York did not provide any citations to the record to support either of these pronouncements, it is unclear upon what testimony New York is relying.

36. Presumably, New York is relying upon the testimony of Dr. Sedding and Mr. Cox, which it discusses in its Proposed Findings at paragraphs 124 through 127. Fairly read, the portions of Dr. Sedding’s testimony cited by New York do not support a finding, as New York proposes, that Entergy’s witnesses conceded that the Inaccessible Cable Program is “*only* sufficient if implemented in accordance” with EN-DC-346.⁸⁷ Rather, Dr. Sedding provided his “overall impression of the program,” which, in the context of his testimony, included both the AMP and the implementing procedure.⁸⁸ Contrary to New York’s characterization, Dr. Sedding did not state or suggest in his testimony that the Inaccessible Cable Program was not sufficient, on its own, to support license renewal.

37. More significant, however, is New York’s incorrect characterization of Mr. Cox’s testimony on this point. Citing Mr. Cox’s testimony from the hearing on Contention NYS-5,

⁸⁵ *Id.* at 46 (¶ 158).

⁸⁶ *Id.* at 1 (¶ 3).

⁸⁷ *Id.* (emphasis added).

⁸⁸ *See* Entergy Testimony at 43-46 (A72) (ENTR00233).

New York claims that Mr. Cox testified “that the implementing procedure is the vehicle that demonstrates that an AMP will comply with GALL.”⁸⁹ A correct reading of the testimony cited by New York, however, shows that Mr. Cox stated that *the AMP itself* – not the implementing procedure – demonstrates the requisite reasonable assurance:

JUDGE McDADE: So your testimony is not just simply a commitment to comply with GALL, but rather that you believe that *your program as documented* demonstrates not only the aspirational aspect but also how it is going to be accomplished. And that in your view that’s adequate to demonstrate compliance. Am I correct?

MR. COX: Yes. I believe that’s correct.⁹⁰

38. Moreover, in the context of the preceding dialogue between Judge McDade and Mr. Cox, it is clear that Mr. Cox took the position that the AMP in question (the Buried Piping and Tanks Inspection Program) was not merely aspirational in nature and did contain sufficient details on how Entergy intended to meet its license renewal commitments.⁹¹ Mr. Cox’s NYS-5 testimony applies equally to Contention NYS-6/7 – that is, the Inaccessible Cable Program, as documented, is not merely aspirational in nature but also demonstrates how Entergy will manage the aging of non-EQ low- and medium-voltage cables.

39. New York also ignores Entergy and NRC Staff testimony that is directly contrary to the findings it has proposed. For instance, Entergy and Staff witnesses testified that, under Commission precedent, a license renewal applicant’s use of an AMP identified in the GALL Report constitutes reasonable assurance that the applicant will manage the relevant aging effects

⁸⁹ New York Proposed Findings at 37 (¶ 127) (citing Dec. 10, 2012 Tr. at 3318:18-25 (Cox)).

⁹⁰ Dec. 10, 2012 Tr. at 3318:18-25 (Cox) (emphasis added).

⁹¹ *See id.* at 3317:1-3318:17 (McDade/Cox).

during the PEO.⁹² In addition, Mr. Cox, Mr. Rucker, and Mr. McCaffrey testified that the Inaccessible Cable Program provides reasonable assurance that the medium-voltage and low-voltage power cables will continue to perform their intended functions during the period of extended operations for the following reasons: (1) the manhole inspection and cable testing methods and frequencies required by the Inaccessible Cable Program are based on industry operating experience and consistent with NUREG-1801 and industry guidance; (2) the manhole inspections will minimize cable exposure to moisture and thus minimize the potential for water-related degradation in underground cables; and (3) the cable tests will confirm that the cable insulation remains in acceptable condition during the period of extended operation.⁹³ Further, “consistent with license renewal Commitment 40, the Inaccessible Cable Program specifies that cable inspection and test frequencies will be increased if necessary based on cable testing and manhole inspection results.”⁹⁴ Finally, Entergy “will incorporate lessons learned from future industry and IPEC operating experience, including test and inspection results obtained during the program’s implementation.”⁹⁵ All of these details are included in the Inaccessible Cable Program itself.⁹⁶

40. Accordingly, the record does not—in any way—support New York’s characterization of Entergy’s testimony as an acknowledgment that Inaccessible Cable Program is insufficient to support license renewal. To the contrary, Entergy’s witnesses provided reliable

⁹² See Entergy’s Statement of Position Regarding Contentions NYS-6/NYS-7 (Non-EQ Inaccessible Medium- and Low-Voltage Cables) at 10 (Mar. 29, 2012) (ENT000232); NRC Staff’s Statement of Position Regarding NYS 6/7 at 13 (Mar. 30, 2012) (NRC000076); Dec. 12, 2012 Tr. at 4024:12-17 (Doutt).

⁹³ Entergy Testimony at 43 (A71) (ENTR00233).

⁹⁴ *Id.*

⁹⁵ *Id.*

⁹⁶ As New York correctly notes, Entergy has amended the Inaccessible Cable Program since it filed its original LRA in April 2007. The Staff’s Supplemental SER describes the evolution and current scope of the amended AMP. See Supplemental SER at 3-5 to 3-9 (NYS000160).

testimony that the AMP was sufficient on its own to provide reasonable assurance that the relevant cables will continue to perform their intended functions during the PEO.

3. The Essential Elements of EN-DC-346 Have Been Incorporated as Binding and Enforceable License Renewal Commitments

41. New York acknowledges in its Proposed Findings that EN-DC-346 provides the details about how Entergy will manage the aging of underground cables exposed to wetting or submergence, but contends that “[n]one of these details are included in Entergy’s amended AMP or the [Updated Final Safety Analysis Report (“UFSAR”)].”⁹⁷

42. New York, however, overlooks relevant contrary evidence showing that the procedure’s essential elements are indeed included in both the amended AMP and UFSAR. For example, as discussed in Entergy’s Proposed Findings, Mr. Cox, Mr. Nguyen, and Mr. Doutt testified at hearing that the “essential elements” of EN-DC-346 have been included in the UFSAR.⁹⁸ In that regard, NRC Staff witness William Holston explained during the Contention NYS-5 hearing that the Staff ensures that the “most critical aspects” of an AMP are incorporated into the UFSAR to “assure that going forward into the period of extended operation those most important characteristics of the program are controlled.”⁹⁹ To that end, the Staff ensured that Entergy incorporated the following “most critical aspects” of EN-DC-346 into the IPEC UFSAR and amended AMP:

- The inclusion of inaccessible low-voltage cables within the scope of the Inaccessible Cable Program;¹⁰⁰

⁹⁷ New York Proposed Findings at 35-36 (¶ 121). New York also mischaracterizes Mr. Cox’s testimony on a related point, citing his testimony as support for the statement that “implementing procedures are not included in the LRA or the UFSAR.” *Id.* at 38 (¶ 129) (citing Dec. 10, 2012 Tr. at 3315:20-3316:05) (Cox)). Although Mr. Cox did testify that implementing procedures are not included in the LRA, he did not testify that they were not included in the UFSAR. *See* Dec. 10, 2012 Tr. at 3315:20-3316:05) (Cox).

⁹⁸ Dec. 12, 2012 Tr. at 4063:12-4064:15 (Nguyen); *id.* at 4064:21-4065:3 (Doutt); *id.* at 4074:24-4075:16 (Cox).

⁹⁹ Dec. 10, 2012 Tr. at 3329:8-22 (Holston).

¹⁰⁰ *See* EN-DC-346, Rev. 3, at 4 (ENT000583); Entergy Testimony at 36 (A56) (ENTR00233); Supplemental SER at 3-8 (NYS000160).

- The removal of exposure to significant moisture as an AMP screening criterion;¹⁰¹
- Manhole inspections at least once per year;¹⁰²
- Evaluation of manhole inspection results to determine the need to adjust the inspection frequency (*e.g.*, to increase the frequency, as appropriate);¹⁰³
- Testing of all in-scope low- and medium-voltage cables for insulation degradation at least once every six years;¹⁰⁴ and
- Review of cable test results to determine the need for more frequent testing.¹⁰⁵

43. As confirmed by Mr. Douth, these commitments have been incorporated into the UFSAR Supplement and are, in the NRC Staff's view, binding on Entergy and will become part of the IPEC licensing basis for the PEO.¹⁰⁶ Accordingly, the Board should find that the necessary critical aspects of EN-DC-346 have been incorporated into the IPEC licensing basis and are, therefore, binding and enforceable license renewal commitments.

¹⁰¹ See generally EN-DC-346, Rev. 3 (ENT000583) (no significant voltage exposure screening criterion); Entergy Testimony at 35-36 (A56) (ENTR00233); NL-11-032, Letter from Fred Dacimo, Vice President, Entergy, to NRC, Document Control Desk, Response to Request for Additional Information (RAI) Aging Management Programs, Attach. 1, at 12 (Mar. 28, 2011) ("NL-11-032") (NYS000151).

¹⁰² NL-11-032, Attach. 1, at 12 (NYS000151); EN-DC-346, Rev. 3, at 15 (ENT000583) (manhole inspection frequency shall be the same frequency specified in the IPEC commitment); Entergy Testimony at 36 (A56) (ENTR00233).

¹⁰³ EN-DC-346, Rev. 3, at 22 (ENT000583) ("Adjust intervals as necessary, based on inspection results."); Entergy Testimony at 36 (A56) (ENTR00233); NL-11-032, Attach. 1, at 12 (NYS000151) (manhole "[i]nspection frequency will be increased as necessary based on evaluation of inspection results").

¹⁰⁴ EN-DC-346, Rev. 3, at 15, 21 (ENT000583) (cable testing shall be performed at the frequency specified in the IPEC license renewal commitment); Entergy Testimony at 36 (A56) (ENTR00233); NL-11-032, Attach. 1 at 12 (NYS000151) (cables "will be tested at least once every six years to provide an indication of the condition of the conductor insulation").

¹⁰⁵ EN-DC-346, Rev. 3, at 19-22 (ENT000583); Entergy Testimony at 36 (A56) (ENTR00233); NL-11-032, Attach. 1, at 12 (NYS000151) (testing frequency adjustments will be "based on test results and operating experience").

¹⁰⁶ Dec. 12, 2012 Tr. at 4067:2-15 (Douth); see also Dec. 11, 2012 Tr. at 3966:12-16 (Green) (stating that when an applicant puts a commitment into its UFSAR, "[o]nce the license is renewed, our regulations require that [the applicant] submit an update to their UFSAR in accordance with 50.71(e). At that time [the commitment] would become part of their current licensing basis.").

4. Prior to the PEO, the NRC Staff Will Review the Effectiveness of EN-DC-346 in Connection with its 10 C.F.R. Part 50 Reactor Oversight Inspection Activities

44. In its Proposed Findings, New York states that there is no evidence in the record that the NRC Staff has reviewed EN-DC-346 to determine whether it effectively implements the Inaccessible Cable Program or is in compliance with the GALL Report.¹⁰⁷ It further argues that the Staff “has not yet made a determination whether the implementing procedures contained in the current version of Entergy’s EN-DC-346 Revision 3 provide reasonable assurance that the Indian Point facilities’ current licensing basis will be maintained throughout the period of extended operation.”¹⁰⁸

45. As an initial matter, there is no regulatory requirement that the NRC Staff review and approve a license renewal applicant’s implementing procedures prior to issuing a renewed license, and New York has not identified such a requirement. Indeed, NRC regulations permit license renewal applicants to apply for, and permit the Staff to approve, license renewal up to 20 years prior to expiration of the operating license.¹⁰⁹

46. Moreover, in the *Seabrook* license renewal proceeding discussed above, the Commission reiterated its prior holding that “[i]f the NRC concludes that an [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).”¹¹⁰ Thus, the Commission has interpreted Section 54.21(c)(1) to permit a demonstration *after* the issuance of a renewed license, because “an applicant’s use of an [AMP]

¹⁰⁷ New York Proposed Findings at 39 (¶ 134).

¹⁰⁸ *Id.* at 46 (¶ 158).

¹⁰⁹ 10 C.F.R. § 54.17(c).

¹¹⁰ *Seabrook*, CLI-12-05, slip op. at 4 (emphasis added) (citing *Vermont Yankee*, CLI-10-17, 72 NRC at 36; *Oyster Creek*, CLI-08-23, 68 NRC at 467-68).

identified in the GALL Report constitutes reasonable assurance that it will manage the targeted aging effect during the renewal period.”¹¹¹

47. In that regard, as Mr. Cox and Mr. Rucker explained, the actual implementation of license renewal AMPs, including their related procedures, is verified by the NRC Staff through an inspection conducted in accordance with the guidance in NRC Inspection Procedure (“IP”) 71003, “Post-Approval Site Inspection for License Renewal” (ENT000251) – and not as part of the LRA review process.¹¹² As Staff witness Mr. Holston explained during the Contention NYS-5 hearing, the purpose of the IP 71003/Temporary Instruction 2516/001 inspection is for the Staff to review Entergy’s implementing procedures to ensure that each of the commitments made in the LRA have been incorporated into the procedures.¹¹³ Mr. Holston further testified that, if the NRC Staff found that Entergy had not incorporated its commitments into the procedures at the time of the inspection, the Staff could issue findings against Entergy.¹¹⁴ Specifically, the Staff’s inspection team would identify any “gap” in Entergy’s implementation of its commitments.¹¹⁵

¹¹¹ *Oyster Creek*, CLI-08-23, 68 NRC at 468.

¹¹² Entergy Testimony at 59 (A97) (ENTR00233); *see also* Dec. 12, 2012 Tr. at 4079:2-9 (Doutt). As Mr. Doutt, Mr. Cox, and Mr. Rucker explained, given the end of the IP2 initial operating license term in 2013, the NRC Staff issued Temporary Instruction 2516/001 (ENT000252) to allow NRC inspectors to assess Entergy’s progress in implementing its license renewal AMPs and commitments during the pendency of the license renewal approval process. NRC Region I inspectors conducted an inspection at IP2 under Temporary Instruction 2516/001 during the week of March 5-9, 2012. *See* NRC Staff’s Status Report in Response to the Atomic Safety and Licensing Board’s Order of February 16, 2012 at 3-4 (Mar. 1, 2012), *available at* ADAMS Accession No. ML12061A455.

¹¹³ Dec. 10, 2012 Tr. at 3356:14-3357:1 (Holston); *see also id.* at 3359:8-11 (Holston) (“And their job . . . specifically for that inspection is to verify that each of those commitments have been put into procedures.”); *see also* Entergy Testimony at 59-60 (A97) (ENTR00233) (describing the Staff’s IP 71003 inspection process).

¹¹⁴ Dec. 10, 2012 Tr. at 3357:2-4 (Holston) (“If a licensee has not . . . implemented those actions, they’re subject to findings and violations.”).

¹¹⁵ *Id.* at 3359:14-22 (Holston). For IP2, the NRC Staff has scheduled dates in May and September 2013 to complete its onsite Temporary Instruction 2516/001 inspection. *See* Letter from A. Burritt, NRC, to J. Ventosa, Entergy, at 1, Indian Point Inspection/Activity Plan at 1-2 (Mar. 4, 2013), *available at* http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/LETTERS/inpt_2012q4.pdf (last visited May 2, 2013).

48. In any event, as the NRC Staff correctly points out, Entergy has already implemented EN-DC-346 and is using the procedure now at IPEC under its current operating license.¹¹⁶ Therefore, the procedure and Entergy’s activities pursuant to the procedure are currently subject to NRC Staff review, inspection, and enforcement under the Part 50 reactor oversight process, which further supports Entergy’s position that a Staff review of EN-DC-346 is not required as part of the LRA review process.¹¹⁷

* * * *

49. In sum, NRC regulations do not require Entergy to provide the level of detail sought by New York in its AMP. Further, the Inaccessible Cable Program described in LRA Section B.1.23 is consistent with the AMP described in GALL Report Section XI.E3, and therefore, pursuant to the Commission’s decisions in *Oyster Creek*, *Vermont Yankee*, and *Seabrook*, the Board should find that the Inaccessible Cable Program – by itself – provides reasonable assurance that Entergy will manage aging effects on all non-EQ inaccessible low- and medium-voltage cables during the PEO. Although it is unnecessary for the Board to reach beyond this finding in light of *Oyster Creek*, *Vermont Yankee*, and *Seabrook*, the evidence nonetheless shows that the IPEC LRA and UFSAR are sufficiently linked, through binding commitments with essential elements of procedure EN-DC-346, and that the procedure provides a sufficient level of detail on how Entergy will implement the AMP in the PEO. Further, Entergy’s commitments are binding and enforceable.

¹¹⁶ See NRC Staff Proposed Findings at 28 (¶ 3.115); see also Dec. 12, 2012 Tr. at 4075:5-6 (Cox) (“This procedure is on the street. It’s been approved.”).

¹¹⁷ See, e.g., Letter from Mel Gray, NRC, to John Ventosa, Entergy, Indian Point Nuclear Generating Unit 2 – NRC Integrated Inspection Report 05000247/2011005, Attach. at A-3 (Feb. 8, 2012), available at ADAMS Accession No. ML12039A162 (identifying EN-DC-346, Rev. 2 as one of the procedures reviewed by the Staff); Letter from Mel Gray, NRC, to John Ventosa, Entergy, Indian Point Nuclear Generating Unit 2 – NRC Integrated Inspection Report 05000247/2011005, Attach. at A-4 (Apr. 30, 2012), available at ADAMS Accession No. ML12121A641 (identifying EN-DC-346, Rev. 2 as one of the procedures reviewed by the Staff).

50. For the reasons stated above and in Entergy's Proposed Findings, Entergy's AMP and license renewal commitments provide reasonable assurance that Entergy will adequately manage aging effects on all non-EQ inaccessible low- and medium-voltage cables during the PEO.

E. IPEC's Inaccessible Cable Program Also Provides Reasonable Assurance that Entergy Will Adequately Manage the Aging Effects on Below-Ground Cables Within the Scope of the Program Caused by Thermal Stress

51. As discussed above, there is no dispute among the parties that Entergy's Inaccessible Cable Program is technically adequate to manage heat-related aging effects on below-ground cables. What remains in dispute with respect to management of heat-related degradation is whether Entergy is required to incorporate certain "representations" regarding its cable systems into an AMP for inaccessible cables.¹¹⁸

52. As noted above, in its Proposed Findings, New York acknowledges and does not challenge Entergy witness testimony on the following points: (1) there are no external heat sources at IPEC; (2) the only potential source of heat would be the cables themselves; (3) the IPEC cable systems were designed to avoid the ohmic heating that can occur when heat cannot dissipate in the surrounding environment or the mutual heating effect from cables that are in too close proximity to one another; (4) if Entergy makes changes to the plant or to the plant's electrical systems and components, Entergy would reevaluate the design calculations to verify that the modifications would not invalidate the temperature requirements for the cable; and (5) testing of the cable insulation for moisture damage would also detect any heat-related degradation.¹¹⁹

¹¹⁸ New York Proposed Findings at 47 (¶ 159).

¹¹⁹ *Id.*

53. In short, New York no longer offers any technical challenges to Entergy's ability to manage heat-related aging effects in accordance with its CLB and planned cable testing. Rather, New York contends that "Entergy has not incorporated these representations into an enforceable and detailed proposed AMP for inaccessible cables," and therefore, Entergy's AMP does not provide reasonable assurance that the IPEC CLB will be maintained throughout the PEO.¹²⁰

54. As an initial matter, New York cites to no regulation or legal authority that requires the incorporation of such "representations" into an AMP. Moreover, it would make little sense to include design-related representations regarding heat sources and the original IPEC cable designs into a license renewal AMP. As Entergy witnesses Mr. Rucker and Dr. Sedding and NRC Staff witnesses Mr. Doutt and Mr. Nguyen explained, heat-related degradation is a design issue that is covered by the CLB, not a new aging effect requiring management during the PEO.¹²¹ Further, cable testing is already incorporated into the AMP and the implementing procedure.¹²² Consequently, New York's remaining concerns are either beyond the scope of license renewal or already addressed in the Inaccessible Cable Program.

55. Accordingly, for the reasons stated here and in Entergy's Proposed Findings,¹²³ IPEC's Inaccessible Cable Program provides reasonable assurance that Entergy will adequately manage the effects of aging due to thermal stress on all below-ground cables within the scope of the program.

¹²⁰ *Id.*

¹²¹ Entergy Testimony at 78 (A125) (ENTR0233); NRC Staff Testimony at 27 (A29) (NRC000077).

¹²² See LRA at B-81 (ENT00015B); EN-DC-346, Rev. 3 at 4 (ENT000583).

¹²³ See Entergy Proposed Findings at 52-60 (¶¶ 121-36).

F. The NRC Staff and Entergy Have Appropriate Processes in Place to Ensure That Entergy Complies With Its Commitments and EN-DC-346 During the PEO

56. As discussed above, the parties agree that procedure EN-DC-346 provides a sufficient level of detail on how Entergy will implement the Inaccessible Cable Program during the PEO. New York continues to assert, however, that the provisions of EN-DC-346 “are not incorporated in the LRA or the UFSAR and are not binding on the applicant or enforceable by Staff.”¹²⁴ As a result, New York claims, the Inaccessible Cable Program does not provide the requisite reasonable assurance.¹²⁵ New York’s argument lacks merit in several respects.

57. As an initial matter, there is no regulatory or other legal basis for New York’s suggestion that every procedural detail must be elevated to a legally binding commitment in order to demonstrate the reasonable assurance required for license renewal, and New York cites to none. Indeed, imposing such a requirement on licensees would be a significant and unjustified departure from how the NRC regulates licensees today.¹²⁶

58. Further in that regard, as Entergy witnesses explained, including entire procedures in the UFSAR is neither warranted nor practical. Entergy witness Nelson Azevedo testified during the Contention NYS-5 hearing that incorporating the hundreds of procedures associated with the various AMPs at IPEC would involve incorporating thousands of pages of procedures in the UFSAR.¹²⁷ It would be unnecessary and cumbersome to include all of the procedural details in the UFSARs, particularly given that changes to those procedures are subject to the 10 C.F.R. §

¹²⁴ New York Proposed Findings at 46-47 (¶ 158(B)).

¹²⁵ *Id.*

¹²⁶ *See* Dec. 11, 2012 Tr. at 3654:7-14 (Cox) (“[W]e’re following a process that’s ... evolved over 30 to 40 years of operation at these plants. And if you step outside of license renewal, you don’t see references to individual procedures in the [UF]SAR where it talks about how we do things.”).

¹²⁷ *Id.* at 3656:14-17, 3967:3-18 (Azevedo).

50.59 process.¹²⁸ Further, as Mr. Cox explained, the vast majority of changes that are made to AMPs are “changes that are made to reflect [the] evolving knowledge of the industry.”¹²⁹ Mr. Cox further testified that including the key “high-level” program requirements in the FSAR, and additional, more granular program details in other documents (*i.e.*, implementing procedures) that are subject to the 10 C.F.R. § 50.59 change process, is a long-standing and effective system.¹³⁰ Specifically, it provides licensees the flexibility to make necessary program changes and improvements, but ensures that such changes are controlled and evaluated for safety impacts and effectiveness.¹³¹ New York has not demonstrated why, for this particular LRA, a radical departure from this established regulatory process is necessary to show reasonable assurance.

59. In any event, as discussed above, the essential elements of EN-DC-346 have been included in the IPEC UFSAR Supplement, and therefore, are binding and enforceable commitments.¹³² For those elements of EN-DC-346 that are not specifically incorporated into the IPEC UFSAR Supplement, the record shows that the NRC Staff and Entergy have processes in place to ensure that Entergy is adhering to its commitments and internal procedures both before and during the PEO.

1. The NRC Staff Has Existing Established Processes to Ensure Entergy’s Compliance with its Commitments and Internal Procedures During the PEO

60. In particular, and as already described above, before the PEO begins, the NRC Staff will perform an IP 71003/Temporary Instruction 2516/001 inspection at IPEC.¹³³ During the PEO, the NRC Staff will continue to conduct inspections and audits under the 10 C.F.R. Part

¹²⁸ *Id.* at 3656:14-3658:18 (Azevedo, Cox).

¹²⁹ *Id.* at 3944:11-15 (Cox).

¹³⁰ *Id.* at 3944:16-25 (Cox).

¹³¹ *Id.*

¹³² Dec. 12, 2012 Tr. at 4063:12-4064:15 (Nguyen); *id.* at 4064:21-4065:3 (Doutt); *id.* at 4074:24-4075:16 (Cox).

¹³³ Entergy Testimony at 59 (A97) (ENTR00233); *see also* Dec. 12, 2012 Tr. at 4079:2-9 (Doutt).

50, Appendix B inspection criteria as part of the NRC’s general reactor oversight process.¹³⁴ Mr. Cox and Mr. Doust further indicated that, as part of that oversight process, the NRC monitors Entergy’s compliance with its internal procedures, including EN-DC-346.¹³⁵ As Mr. Cox testified, Entergy is required to follow its own procedures, and any failure to do so could result in a notice of violation under the NRC’s Enforcement Policy.¹³⁶

2. Any Procedure Modifications Made by Entergy are Subject to a Rigorous Internal Review Process and NRC Oversight

61. New York proposes a number of findings related to Entergy’s ability to modify certain aspects of EN-DC-346 without prior NRC approval.¹³⁷ In particular, New York asserts that Entergy is not “legally required” to perform 10 C.F.R. § 50.59 screening evaluations for procedural changes that are not specifically incorporated in the UFSAR, suggesting (for the first time in this proceeding) that, because no regulation requires Entergy to perform such screens, Entergy will not follow its internal screening procedure.¹³⁸

62. As an initial matter, Entergy does not perform 10 C.F.R. § 50.59 screens voluntarily, but rather, it performs such screens in order to comply with its regulatory obligations under § 50.59. To comply with § 50.59, licensees such as Entergy must determine whether a proposed procedure change will have an adverse effect on a safety question previously evaluated by the NRC Staff in the UFSAR.¹³⁹ As Mr. Cox explained, to determine whether § 50.59 applies

¹³⁴ Dec. 12, 2012 Tr. at 4079:10-4080:9 (Doust); *id.* at 4080:10-15 (Cox).

¹³⁵ *Id.* at 4080:1-9 (Doust); *id.* at 4080:10-15 (Cox).

¹³⁶ *See* Dec. 10, 2012 Tr. at 3469:23-3470:25 (Cox) (“So to the extent that these are site procedures, they have to be followed by Entergy. They are enforceable in the sense that if we don’t do what the procedure says, we are subject to a violation.”).

¹³⁷ *See* New York Proposed Findings at 39-43 (¶¶ 136-50).

¹³⁸ *Id.* at ¶¶ 42-43 (146-50).

¹³⁹ *See* 10 C.F.R. § 50.59.

to a particular procedure change, Entergy uses a screening process.¹⁴⁰ Thus, the screening process is part of the process Entergy follows to comply with its obligations under 10 C.F.R. § 50.59.¹⁴¹

63. New York does not challenge the technical adequacy of Entergy’s § 50.59 screening process – *i.e.*, Entergy’s Process Applicability Determination (“PAD”). As described in Entergy’s Proposed Findings, the record evidence demonstrates that Entergy already has in place rigorous processes to evaluate proposed procedure changes that include multiple levels of technical review, even for those procedure changes that do not require a full Section 50.59 evaluation.¹⁴² These same processes would apply during the PEO.

64. Entergy witness Mr. Azevedo explained during the Contention NYS-5 hearing that, pursuant to a separate Entergy procedure that controls procedure modifications, “all procedure changes go through [a] 50.59 screen whether they are in the [U]FSAR or not.”¹⁴³ As noted above, as part of the NRC’s reactor oversight process, the NRC monitors Entergy’s compliance with its internal procedures, and any failure to comply on Entergy’s part could result in a notice of violation under the NRC’s Enforcement Policy.¹⁴⁴

¹⁴⁰ Dec. 10, 2012 Tr. at 3470:17-22 (Cox) (Any procedure “change has to be made under the provisions of 50.59, if it applies. We have to do the screening to see if it applies, and then if it does, we have to apply the questions of 50.59.”).

¹⁴¹ *Id.* at 3471:18-3472:4 (Cox) (“[W]e have a procedure that deals with 50.59 evaluations, and the screening is part of that procedure.”).

¹⁴² *See* Entergy Proposed Findings at 63-66 (¶¶ 145-52).

¹⁴³ Dec. 11, 2012 Tr. at 3655:13-16 (Azevedo) (“That’s our process. We have to do a 50.59 screen for all procedure changes.”); *see also id.* at 3471:18-21 (Cox) (“[T]o make a procedure change, we have to do the screening.”).

¹⁴⁴ Dec. 12, 2012 Tr. at 4080:1-9 (Doutt); *id.* at 4080:10-15 (Cox); *see also* Dec. 10, 2012 Tr. at 3469:23-3470:25 (Cox) (“So to the extent that these are site procedures, they have to be followed by Entergy. They are enforceable in the sense that if we don’t do what the procedure says, we are subject to a violation.”).

65. Thus, Entergy cannot simply “change procedures at will.”¹⁴⁵ Rather, as Mr. Doutt, Mr. Rucker, and Mr. Cox indicated, Entergy would evaluate proposed modifications to EN-DC-346 (e.g., changing the cable testing technique¹⁴⁶) pursuant to its PAD procedure, and if applicable, its 10 CFR 50.59 Evaluations procedure to determine whether the procedure change would conflict with a commitment in the IPEC UFSAR Supplement or other licensing basis document.¹⁴⁷

* * * *

66. Accordingly, for the reasons stated above and in Entergy’s Proposed Findings,¹⁴⁸ the Board should find that Entergy and the Staff have sufficient existing procedural and regulatory processes in place to ensure that Entergy will comply with its Inaccessible Cable Program commitments and with its procedure EN-DC-346 during the PEO.

F. IPEC’s Cables and Connections Program Provides Reasonable Assurance That Entergy Will Adequately Manage Aging Effects on All Above-Ground Medium- and Low-Voltage Cables Within the Scope of the Program

67. In its Proposed Findings – and for the first time in the adjudication of this contention – New York raises a challenge to the IPEC Cables and Connections Program and its implementing procedure, EN-DC-348, Non-EQ Insulated Cables and Connections Inspection.¹⁴⁹

¹⁴⁵ Dec. 12, 2012 Tr. at 4189:13-20 (Cox).

¹⁴⁶ *See id.* at 4176:22-4177:11 (Rucker).

¹⁴⁷ *See id.* at 4082:21-4083:22 (McCaffrey); *id.* at 4189:13-20 (Cox); *see also* Dec. 10, 2012 Tr. at 3403:1-6 (Cox) (“[P]rocedures are, again, under the control of [the] 50.59 process. So there has to be an evaluation done of those procedures to make sure we don’t make unacceptable changes that would reduce the level of safety or effectiveness of that program.”).

¹⁴⁸ *See* Entergy Proposed Findings at 60-67 (¶¶ 137-53).

¹⁴⁹ EN-DC-348, Rev. 2, Non-EQ Insulated Cables and Connections Inspections (July 5, 2011) (“EN-DC-348”) (ENT000241).

Specifically, New York asserts that EN-DC-348 “provides no specific inspection requirement or corrective action directives” for inaccessible above-ground cables.¹⁵⁰

68. As an initial matter, EN-DC-348 does require Entergy to evaluate the potential effects of adverse local equipment environments (“ALEEs”) on both accessible and inaccessible cables.¹⁵¹ In addition, Mr. Rucker and Mr. Cox explained that Entergy relies on the IPEC corrective action process to evaluate inaccessible cables located in an ALEE and to determine if further actions are needed.¹⁵²

69. Further, in response to Board questioning, New York’s expert expressly declined to offer any opinions regarding above-ground cables. At the hearing, Mr. Bascom acknowledged that he had “no basis to evaluate or assume that there would be an issue with the above-ground cables that were inaccessible” and within the scope of the Cables and Connections Program.¹⁵³ Therefore, there is no factual or expert evidence in the record to support New York’s proposed findings that are critical of the IPEC Cables and Connections Program.

70. For these reasons, and the reasons stated in Entergy’s Proposed Findings,¹⁵⁴ Entergy has demonstrated that it will adequately manage the aging effects on cables within the scope of the Cables and Connections Program during the PEO.

III. CONCLUSION

71. In summary, the preponderance of the evidence shows that Entergy has taken, or will take, actions necessary to provide reasonable assurance that the effects of aging will be

¹⁵⁰ New York Proposed Findings at 45 (¶ 156).

¹⁵¹ EN-DC-348, Rev. 2, at 21 (ENT000241) (“ALEEs shall be reviewed to determine the potential effects on accessible and inaccessible cable and to determine the extent of the effect.”).

¹⁵² Entergy Testimony at 48 (A79) (ENTR00233); EN-LI-102, Rev. 17, Corrective Action Process (Dec. 8, 2011) (ENT000249).

¹⁵³ Dec. 12, 2012 Tr. at 4103:18-21 (Bascom).

¹⁵⁴ See Entergy Proposed Findings at 67-68 (¶¶ 154-58).

managed during the PEO for non-EQ inaccessible low- and medium-voltage cables within the scope of IPEC's Inaccessible Cable Program and Cables and Connections Program.

Accordingly, Entergy has carried its burden of proof and satisfied its obligations under 10 C.F.R. §§ 54.21 and 54.29, and Contention NYS-6/7 should be resolved in Entergy's favor.

Respectfully submitted,

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

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Dated in Washington, D.C.
this 3rd day of May 2013

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

_____)	Docket Nos. 50-247-LR and
In the Matter of)	50-286-LR
ENTERGY NUCLEAR OPERATIONS, INC.)	
(Indian Point Nuclear Generating Units 2 and 3))	
_____)	May 3, 2013

CERTIFICATE OF SERVICE

Pursuant to 10 C.F.R. § 2.305 (as revised), I certify that, on this date, copies of “Entergy’s Reply to New York State Findings of Fact and Conclusions of Law For Contentions NYS-6 and NYS-7 (Non-Environmentally Qualified Inaccessible Medium- And Low-Voltage Cables)” were served upon the Electronic Information Exchange (the NRC’s E-Filing System), in the above-captioned proceeding.

Signed (electronically) by Lance A. Escher

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