

May 3, 2013

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

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

NRC STAFF'S REPLY FINDINGS OF FACT
AND CONCLUSIONS OF LAW ON
CONTENTION NYS-8 (TRANSFORMERS)

In accordance with 10 C.F.R. § 2.1209 and the Atomic Safety and Licensing Board's Orders,¹ proposed findings of fact and conclusions of law concerning New York State Contention 8 (Transformers) ("Contention NYS-8") were timely filed by Entergy Nuclear Operations, Inc ("Entergy," or the "Applicant"),² the State of New York ("New York"),³ and the NRC Staff ("Staff")⁴ on March 22, 2013. Pursuant to the Licensing Board's Order of

¹ See (1) Scheduling Order (July 1, 2010), at 19; (2) Order (Scheduling Post-Hearing Matters and Ruling on Motions to File Additional Exhibits) (Jan. 15, 2013) at 1; and (3) Order (Granting Parties' Joint Motion for Alteration of Filing Schedule) (Feb. 28, 2013).

² Entergy's Proposed Findings of Fact and Conclusions of Law for Contention NYS-8 (Electrical Transformers), dated March 22, 2013 ("Entergy PF" or "Entergy proposed findings"). The Staff has reviewed Entergy's proposed findings and has determined that a detailed reply thereto is not required. In this regard, the Staff has concluded that the Applicant's findings concerning Contention NYS-8 are not inconsistent with the Staff's findings, and any important substantive differences between the Staff's and Applicant's respective views of the evidence are reflected in their proposed findings of fact and conclusions of law filed on March 22, 2013.

³ State of New York's Proposed Findings of Fact and Conclusions of Law for Contention NYS-8, dated March 22, 2013 ("NYS PF" or "New York's proposed findings").

⁴ NRC Staff's Proposed Findings of Fact and Conclusions of Law Part 4: Contention NYS-8 (Transformers), dated March 22, 2013 ("Staff PF" or "Staff's proposed findings").

February 28, 2013, the Staff herewith files its reply to the Applicant's and New York's proposed findings of fact and conclusions of law concerning Contention NYS-8.⁵

4.146 We do not agree with New York's assertion that the Commission's decision in the *Seabrook*⁶ matter is "irrelevant." NYS PF ¶ 30. At issue here is the proper interpretation of the aging management rule in 10 C.F.R. § 54.21(a), specifically, whether it requires an aging management review for electrical transformers. The Commission's discussion of the regulatory history of 10 C.F.R. § 54.21(a) and Staff guidance issued with respect to that regulation is thus very relevant.⁷ Although New York is correct that the Commission only ruled on the question of contention admissibility, the *Seabrook* transformer contention is identical to the contention at bar. For these reasons we find *Seabrook* instructive.

4.147 While *Seabrook* did not address the contention on substantive grounds, we will do so here: we find that transformers are active components that are readily monitored for condition and performance and thus do not require aging management review or an aging management program.

4.148 New York asserts that the testimony of Entergy's witnesses should be afforded little weight regarding transformer operation and theory. NYS PF ¶ 48. We disagree. Entergy's witnesses have substantial experience working with transformers and license renewal programs within the industry and at the NRC, where they were formerly employed. We find, therefore, that their testimony is entitled to substantial weight.

⁵ The paragraph numbering system in these reply findings follows the numbering system utilized in the Staff's proposed findings. Thus, Staff Reply Finding ¶ 4.146 should be read to follow ¶ 4.145 in the Staff's proposed findings.

⁶ *NextEra Energy Seabrook, LLC* (Seabrook Station, Unit 1), CLI-12-05, 75 NRC 301 (2012), *petition for review denied*, *Beyond Nuclear v. NRC*, 704 F.3d 12 (1st Cir. 2013).

⁷ *Id.* at 316-318.

4.149 Similarly, we find that the Staff witnesses' testimony is entitled to substantial weight by virtue of the Staff witnesses' experience with electrical issues in license renewal. Accordingly, we cannot accept NYS PF ¶ 52.

4.150 New York incorrectly argues that the ability to detect gross failure of a component is not relevant to a determination whether that component is subject to aging management review. NYS PF ¶¶ 57-58. As the Statement of Considerations ("SOC") that accompanied the issuance of the license renewal rule made clear, one of the characteristics of an active component is that failure (whether gross or partial) of an active component is readily apparent.⁸ In the SOC, the Commission wrote: "Direct verification is practical for active functions such as pump flow, valve stroke time, or relay actuation where the parameter of concern (required function), including any design margins, can be directly measured or observed."⁹ Thus, the ability to detect gross failure is a characteristic of an active component; it is not the test for determining whether a component is active or passive. The test for determining whether a component is active or passive is the extent to which its performance and condition -- its functionality -- can be directly or indirectly measured. "Functional degradation resulting from the effects of aging on active functions is more readily determinable, and existing programs and requirements are expected to directly detect the effects of aging."¹⁰

4.151 Passive components, on the other hand, "do not have performance and condition characteristics that are as readily monitorable as active components."¹¹

4.152 New York also mischaracterizes Ms. Ray's testimony on behalf of the NRC Staff as an admission, suggesting that her testimony at the hearing was at odds with her pre-filed

⁸ Final Rule, Nuclear Power Plant License Renewal; Revisions, 60 Fed. Reg. 22,461, 22,471 (May 8, 1995) ("License Renewal SOC") (Ex. NYS000016)).

⁹ *Id.*

¹⁰ *Id.* at 22,472.

¹¹ *Id.* at 22,476.

testimony. NYS PF ¶ 58. At the hearing, Ms. Ray agreed with the Board that the fact that a component's gross failure was readily detectable did not exempt that component from aging management review.¹² She went on to say, "I would say that the point is to track aging, not to necessarily detect the gross failure, but to detect continual aging of the component." In her pre-filed testimony, when asked to identify the characteristics of active components, Ms. Ray replied that one of the **characteristics** of an active component is that failure of an active component is readily apparent.¹³ She went on to point out that another one of the characteristics of active components is that age-related degradation is usually readily monitorable.¹⁴ Thus, Ms. Ray's testimony at the hearing was consistent with her pre-filed testimony. While gross failure of an active component is usually readily apparent, that is not the test or the goal of the license renewal rule, and Ms. Ray never said that it was; it is the ready monitorability of the performance and condition that the rule relies on to distinguish between active and passive components.¹⁵

4.153 We reject NYS PF ¶¶ 63-66 and 168 as they misapprehend the significance of the Maintenance Rule, 10 C.F.R. § 50.65, in the license renewal framework. New York is incorrect when it asserts that "whether the maintenance rule is sufficient for monitoring age related degradation in transformers is not relevant to determining whether they are subject to

¹² Tr. at 4243 ("Wardwell: And it's your opinion that that says that the ability to detect gross failure is sufficient to exempt a system, structure, or component from Aging Management Review? Ms. Ray: No, I would say that the point is to track aging, not to necessarily detect the gross failure, but to detect continual aging of the component.")

¹³ NRC Staff's Testimony of Roy Mathew and Sheila Ray Concerning Contention NYS-8 (Transformers) ("Staff Testimony on NYS-8") (Ex. NRC000031) at 8.

¹⁴ *Id.*, see also Staff Testimony on NYS-8 (Ex. NRC000031) at 9.

¹⁵ See 60 Fed. Reg. at 22,471-72 ("Direct verification is practical for active functions such as pump flow, valve stroke time, or relay actuation where the parameter of concern (required function), including any design margins, can be directly measured or observed. For passive functions, the relationship between the measurable parameters and the required function is less directly verified. Passive functions, such as pressure boundary and structural integrity are generally verified indirectly, by confirmation of physical dimensions or component physical condition. . . Functional degradation resulting from the effects of aging on active functions is more readily determinable, and existing programs and requirements are expected to directly detect the effects of aging.")

AMR.” NYS PF ¶ 66. We find that whether or not the Maintenance Rule is sufficient to address age-related degradation is highly relevant to the question whether a component requires aging management review.

4.154 The License Renewal SOC states that aging management review is needed for passive components because the Maintenance Rule is not sufficient to provide reasonable assurance that passive components will continue to perform their intended functions during the period of extended operation.¹⁶ In the SOC, the Commission concluded, “that current licensee programs and activities, along with the regulatory process, will be adequate to manage the effects of aging on the active functions of all systems, structures, and components within the scope of license renewal.”¹⁷ However, the Commission pointed out, “performance and condition monitoring programs for structures and components that perform passive functions present limitations.”¹⁸ Accordingly, the Commission determined that “structures and components should be reviewed for license renewal if they are passive and long-lived.”¹⁹ The Commission explained that for passive long-lived components, “[t]here may be few, if any, actual maintenance activities (e.g. inspection or condition monitoring) that a licensee conducts for such components.”²⁰ Thus, the question may be framed in this way: “Do current activities, including activities under the Maintenance Rule, provide reasonable assurance, through actual maintenance activities (e.g., inspection or condition monitoring), that transformers will perform their intended functions through the period of extended operation?” If so, then no aging management review is needed.

¹⁶ 60 Fed. Reg. at 22,471 (Ex. NYS000016); *see also* Tr. at 4242-43 (Ray).

¹⁷ 60 Fed. Reg. at 22,471 (Ex. NYS000016).

¹⁸ *Id.*

¹⁹ *Id.* at 22,470.

²⁰ *Id.*

4.155 Witnesses for the Staff and Entergy have answered, unequivocally, that current programs provide this assurance for transformers. The Staff witnesses have identified numerous maintenance programs and numerous condition and performance monitoring programs applicable to transformers.²¹ Entergy's witnesses have identified the specific maintenance and condition and performance monitoring methods used with respect to the transformers at Indian Point.²² Because the Maintenance Rule and other current programs provide reasonable assurance that transformers will perform during their period of extended operation, transformers do not require aging management review.

4.156 We note that New York also appears to be suggesting that because the preventive maintenance provision of the Maintenance Rule, 10 C.F.R. § 50.65(a)(2), applies to transformers, transformers are passive components. NYS PF ¶¶ 63-66. This is incorrect.

4.157 It is not the applicability of subsection (a)(1) or (a)(2) of the Maintenance Rule that determines whether a component is active or passive. The proper question is instead, "What is required for reasonable assurance that transformers will continue to perform their intended function during the period of license renewal?" We find that reasonable assurance for transformers is obtained through existing programs (which include the Maintenance Rule) and that no aging management program need be added to those existing programs. As the Staff witnesses testified, "The Maintenance Rule, along with existing monitoring, surveillance, inspection and testing programs, serves the purpose for electrical transformers that an AMP would serve for a passive component."²³

4.158 NYS PF ¶ 128 is inconsistent with the history of the regulation that it relies upon and is not supported by the record. Accordingly, we cannot sustain it.

²¹ See Staff PF ¶¶ 4.57-60, 4.63.

²² See Entergy PF ¶¶ 156-158.

²³ Staff Testimony on NYS-8 (Ex. NRC000031) at 20.

4.159 Monitorability is not identified in the regulation in 10 C.F.R. § 54.21 as a criterion for determining whether a component requires aging management review. However, as the SOC for the regulation makes clear, 10 C.F.R. § 54.21 differentiates between components that have moving parts, and change configuration or properties, and those that do not -- it is that very movement or change that renders active components directly monitorable and it is that direct monitorability that renders aging management review unnecessary.²⁴ The SOC stated, “Direct verification is practical for active functions such as pump flow, valve stroke time, or relay actuation where the parameter of concern (required function), including any design margins, can be directly measured or observed.”²⁵ In contrast, passive components are indirectly monitored.²⁶ It is, thus the ease and directness with which a component can be monitored that is the reason for the difference in treatment between active and passive components. We find that NYS PF ¶ 128 is contrary to the SOC’s discussion of active and passive components and we reject it.

4.160 New York also claims that transformers are like steam generators and heat exchangers because in all of them internal health can only be determined by testing. NYS PF ¶ 128. However, contrary to New York, there is substantial testimony from the Staff and Entergy regarding the various means by which the internal health of a transformer may be determined, some of which involve testing and some of which do not.²⁷ Thus, New York is simply incorrect when it states that the internal health of a transformer can only be determined by testing. Also, the portion of the record that New York cites does not support its assertion. New York cites its witness’s testimony at the hearing as support for the proposition that transformers are similar to

²⁴ 60 Fed. Reg. at 22,471 (Ex. NYS000016).

²⁵ *Id.*

²⁶ *Id.*

²⁷ Staff PF ¶¶ 4-63 to 68, Entergy PF ¶¶ 131-136; Entergy Testimony on NYS-8 (Ex. ENT000091) 86-87, 96-98.

steam generators because, New York asserts, neither is readily monitorable.²⁸ However, Dr. Degeneff declined to testify as to the monitorability of the internal health of steam generators. He stated that he was “not familiar with the monitoring of the steam generator.”²⁹ Thus, New York’s claim in NYS PF ¶ 128 is not supported by the record.

4.161 New York also asserts that the internal condition of a transformer cannot be determined by monitoring its performance. NYS PF ¶¶ 145-157. This assertion ignores the large body of evidence in the record that demonstrates that condition monitoring can be employed to assess the internal health of a transformer, including testimony at the hearing from New York’s own witness.³⁰ In light of the evidence that shows that transformers are subject to condition monitoring, we find against New York on this issue.

4.162 The Staff points out that, except for a vague assertion that the frequency of testing be increased and that the program be updated to include advances in technology,³¹ New York has not put forward evidence describing the content of its proposed aging management program for transformers.³² We agree that this is a valid criticism. Somewhere in the evidence it put forward, New York should have stated what a transformer aging management program would include. At the very least, New York should have been able to state what was deficient about the current treatment of transformers under the Maintenance Rule. These claims should have been supported by evidence, either documentary evidence or testimony, that demonstrated that the provisions New York put forward were warranted. However, New York

²⁸ NYS PF ¶ 128.

²⁹ Tr. at 4381.

³⁰ Tr. at 4248 (Degeneff); see also Staff PF ¶¶ 4-63 to 68, Entergy PF ¶¶ 131-136.

³¹ Tr. at 4296-97 (Degeneff).

³² Staff PF ¶ 4.71. We note, here, that the Maintenance Rule requires that licensees re-evaluate their performance and condition monitoring and preventive maintenance activities every 24 months. 10 C.F.R. § 50.65(a)(3). Thus, one half of New York’s desired outcome is already met.

provided none of this. Its witness made vague statements at the hearing, but testified to nothing specific.

4.163 Only now, in its proposed findings, has New York identified one example of the kind of addition it would make to the current maintenance and monitoring program for transformers. New York stated, “For example, an AMP could require Entergy to install online gas monitors on its in-scope transformers and increase the frequency of other tests.” NYS PF ¶ 187.

4.164 Because the purpose of an aging management program is to provide reasonable assurance that a component will continue to function during the period of extended operation, we expected to see some evidence from New York in support of the proposition that online gas monitors are necessary to provide that reasonable assurance. New York has proffered none. The most that can be said for the installation of online gas monitors is that these monitors are one of a number of different means of monitoring the condition of an oil-filled transformer. New York has not explained why online gas monitors are necessary given the current inspection, surveillance, maintenance and monitoring programs that are currently in effect.³³ In light of New York’s failure to support its proposed finding at NYS PF ¶ 187, we cannot support it either.

Respectfully submitted

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Dated at Rockville, Maryland
 this 3rd day of May 2013

³³ In any event, Entergy’s witnesses testified that Entergy plans to install online gas monitors on transformers that are within the scope of license renewal. Entergy Testimony on NYS-8 (Ex. ENT000091) at 103.

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CERTIFICATE OF SERVICE

Pursuant to 10 C.F.R § 2.305 (as revised), I hereby certify that copies of the foregoing "NRC STAFF'S REPLY FINDINGS OF FACT AND CONCLUSIONS OF LAW ON CONTENTION NYS-8 (TRANSFORMERS)," dated May 3, 2013, have been served upon the Electronic Information Exchange (the NRC's E-Filing System), in the above-captioned proceeding, this 3rd day of May, 2013.

/Signed (electronically) by/
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