



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 22, 2024

Thomas Saporito
6526 S Kanner Hwy, Unit 235
Stuart, FL 34997

Dear Thomas Saporito:

I am writing in response to your petition dated September 17, 2023, as amended on November 4, 2023, and November 30, 2023 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML23262A760, ML23310A134, and ML23339A188, respectively), addressed to the U.S. Nuclear Regulatory Commission (NRC) Executive Director for Operations (EDO). The NRC EDO referred your petition to the Office of Nuclear Reactor Regulation for review in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR), Section 2.206, "Requests for action under this subpart." In the petition, you requested that the U.S. Nuclear Regulatory Commission (NRC) deny the subsequent license renewal request (SLR) for Turkey Point Nuclear Plant Units, 3 and 4 (Turkey Point). Your justification for the requested action is that the reactor pressure vessel (RPV) condition has not been adequately assessed for the subsequent period of extended operation, rising sea levels could lead to a severe accident, and that solar power is a safe alternative to the Turkey Point SLR.

Consistent with NRC Management Directive (MD) 8.11, "Review Process for 10 CFR 2.206 Petitions" (ML18296A043), on October 23, 2023, I informed you via e-mail that your September 17, 2023, concerns related to Charpy testing of RPV materials, rising sea level, and solar power screened out of the 10 CFR 2.206 process, and the concerns below regarding the RPV would be evaluated by a petition review board (PRB).

1. The Turkey Point RPV sample process was only intended for the original 40-year safety design basis as there were not enough samples to continue that process beyond 40 years.
2. Consideration of core samples taken from other reactors cannot provide reasonable assurance that the Turkey Point reactor vessels can be safely operated beyond their license expiration dates of July 19, 2032, and April 10, 2033, respectively for several reasons:
 - The exact position of the sample metals in other reactors differs from the Turkey Point reactors.
 - The stress on the reactor vessels in the other reactors differs from the stress on the Turkey Point reactor vessels stemming from emergency shutdowns or "SCRAMS."

On November 3, 2023, the petition manager informed you by e-mail (ML23307A238) of the PRB's initial assessment that the RPV concerns from your petition do not meet the criteria in MD 8.11, Directive Handbook Section III.C.1(b)(ii) for accepting petitions because the RPV issues raised in your petition have previously been the subject of a facility-specific or generic NRC staff review..." and the petition does not provide significant new information that the staff did not consider in the prior reviews. In the enclosure to this letter, the PRB has included its

initial assessment response. In the email dated November 3, 2023, the petition manager offered you an opportunity to meet with the PRB to clarify or supplement your petition with information for the PRB to consider before making a final determination.

On November 4, 2023, you submitted an amendment to your petition (ML23310A134) which expanded the petition scope to request that the NRC require:

1. All pressurized water reactor (PWR) plants operating beyond 40 years to immediately shut down to test their RPV's neutron damage and embrittlement as specified in your amendment.

All PWR plants with renewed licenses or current license renewal applications under review test their RPV's integrity as specified in your amendment prior to the NRC granting an extended operating license.

RPV tests specified in your amendment include: conducting ultrasonic testing, conducting radiographic testing, conducting neutron radiography, conducting described metallographic examinations, conducting ultrasonic velocity measurements, conducting acoustic emission testing, and conducting pulsed eddy current testing.

The basis you provided for these requests is primarily that Charpy testing is not adequate to accurately assess the amount of neutron damage to the licensees' RPVs. You provided that regular and systematic inspections, as well as periodic surveillance programs, are essential for monitoring the condition of the reactor vessel over time and ensuring its safe and reliable operation.

On November 30, 2023, a transcribed virtual public meeting was held (ML23339A188) between you and the PRB in which you raised these expanded/additional requests:

2. Charpy testing is simply not adequate to accurately assess the amount of neutron damage to the licensees' RPVs. Regular and systematic inspections, as well as periodic surveillance programs, are essential for monitoring the condition of the reactor vessel over time and ensuring its safe and reliable operation.
3. Charpy testing is dated and subject to human error so the NRC should require the RPV tests as stated (tests listed in the November 4, 2023, petition amendment above).
4. Require Florida Power and Light (FP&L) to identify and state what their plan is with respect to the rise in sea level in and around Turkey Point.
5. Require FP&L to properly evaluate the environmental impact of seeking to renew the Turkey Point license compared to offering solar power.
6. Require FP&L to provide a plan for disposal and storage of nuclear waste with respect to the rise in sea level.
7. Require FP&L to build protective infrastructure to deal with the rise in sea level.

The PRB has considered the additional concerns and requests from your November 4, 2023, submittal and from the public meeting in the final determination regarding whether the petition meets the criteria for consideration under 10 CFR 2.206. The PRB's responses to your additional concerns and requests are as follows:

2. Charpy testing is simply not adequate to accurately assess the amount of neutron damage to the licensees' RPVs. Regular and systematic inspections, as well as

periodic surveillance programs, are essential for monitoring the condition of the reactor vessel over time and ensuring its safe and reliable operation.

PRB Response

Petition concerns regarding Charpy testing screened out of the 2.206 Petition Process on October 23, 2023, consistent with MD 8.11 Section II.A.2(d)(ii), "General Assertions and Duplicative Requests for Action under 10 CFR 2.206."

The NRC staff is aware of how Charpy impact testing correlates to the actual fracture toughness of an RPV material. The use of Charpy testing is required and fundamental in the current NRC regulatory framework (e.g., Appendices G and H to 10 CFR Part 50 and RG 1.99, "Radiation Embrittlement of Reactor Vessel Materials," Revision 2 [ML031430205]) for assessing the integrity of the RPV. This regulatory framework relies on consensus codes and standards (such as ASTM International (formerly American Society for Testing and Materials Standards)) and includes conservatism and safety factors (as defined in the American Society of Mechanical Engineers (ASME) Code).

Licensees are required to perform various other inspections of the RPV depending on the deployment of the reactor vessel (i.e., pre-service inspection or in-service inspection) in accordance with 10 CFR 50.55a and the ASME Code, Section XI.

3. Charpy testing is dated and subject to human error so the NRC should require the RPV tests as stated (listed above from the November 4, 2023, petition amendment).

PRB Response

See the response to petition concern 1 above.

4. Require Florida Power and Light (FP&L) to identify and state what their plan is with respect to the rise in sea level in and around Turkey Point.

PRB Response

Petition concerns regarding rising sea levels screened out of the 2.206 Petition Process on October 23, 2023, consistent with MD 8.11 Section II.A.2(d)(ii), "General Assertions and Duplicative Requests for Action under 10 CFR 2.206."

The July 22, 2019, Safety Evaluation Report (SER) for the Turkey Point Subsequent License Renewal Application (ML19191A054) includes that external flooding is a design basis event which FP&L has adequately considered regarding safe operation and safe shut down.

NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants Regarding Subsequent License Renewal for Turkey Point Nuclear Generating Unit Nos. 3 and 4 (NUREG-1437, Supplement 5, Second Renewal) Final Report," (ML19290H346) (October 2019) discusses historic and expected sea levels.

5. Require FP&L to properly evaluate the environmental impact of SLR compared to offering solar power.

PRB Response

Petition concerns regarding solar power as an alternative to SLR based nuclear power screened out of the 2.206 Petition Process on October 23, 2023, consistent with MD 8.11 Section II.A.2(d)(v), "Requests That Would Not Reasonably Lead to an Enforcement Action."

The NRC does not have the regulatory authority to compel a licensee to seek alternatives to nuclear power. However, as part of the relicensing process, the NRC did consider alternatives to granting the renewed license. NUREG-1437, "Supplement 5, Second Renewal "Generic Environmental Impact Statement for License Renewal of Nuclear Plants - Supplement 5, Second Renewal - Regarding Subsequent License Renewal for Turkey Point Nuclear Generating Unit Nos. 3 and 4"" (ML19290H346), considers and weighs the environmental effects of SLR and the environmental impacts of alternatives to SLR. The NRC staff evaluation of solar power as an alternative to SLR can be found in Section 2.3.1, "Solar Power."

6. Require FP&L to provide a plan for disposal and storage of nuclear waste with respect to the rise in sea level.

PRB Response

Petition concerns regarding rising sea levels screened out of the 2.206 Petition Process on October 23, 2023, consistent with MD 8.11 Section II.A.2(d)(ii), "General Assertions and Duplicative Requests for Action under 10 CFR 2.206."

The petition does not state that FP&L is currently not in compliance with 10 CFR 72.212 and 10 CFR 72.236 regarding methods to store spent nuclear fuel or with 10 CFR 60 or 10 CFR 63 regarding disposal of nuclear waste. There is no specific indication that FP&L will fail to remain in compliance with these regulations if generally expected sea level rises occur.

7. Require FP&L to build protective infrastructure to deal with the rise in sea level.

PRB Response

Petition concerns regarding rising sea levels screened out of the 2.206 Petition Process on October 23, 2023, consistent with MD 8.11 Section II.A.2(d)(ii), "General Assertions and Duplicative Requests for Action under 10 CFR 2.206." Please see the response to petition concern 6 above.

The PRB's final determination is that your petition, as amended, still does not meet the MD 8.11, Directive Handbook Section III.C.1(b)(ii) criteria for consideration under 10 CFR 2.206 because the issues raised have previously been the subject of a facility-specific or generic NRC staff review, and none of the three additional Section III.C.1(b)(ii) circumstances apply.

In summary, the PRB evaluated the concerns in your petition that screened into the 2.206 process related to the PWR RPV integrity. Licensees must comply throughout the licensed operating period with the current regulations regarding the integrity of the RPV as contained in 10 CFR 50.55a, 50.60, 50.61, and Appendices G and H to 10 CFR Part 50.

If your opinion is that the regulations imposed upon the licensees regarding RPV assessment and related operational limits are deficient, please consider submitting a petition for rulemaking ([web link](#)) consistent with 10 CFR Sections 2.802 and 2.803.

The regulations in 10 CFR 2.206 provide an opportunity for the public to petition the NRC to take enforcement-related action, and, while the PRB determined that the issues raised have previously been the subject of a facility-specific or generic NRC staff review, the NRC understands that this process takes time, resources, and energy by petitioners. Accordingly, I thank you for taking the time to raise your concerns.

Sincerely,

Jamie M. Heisserer, Deputy Director
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Enclosure:
Initial Assessment Responses

Petition Review Board Initial Assessment Responses
10 CFR 2.206 Petition from Thomas Saporito
License Renewal Plant Reactor Pressure Vessel Embrittlement

The November 3, 2023, initial assessment e-mail included the following responses to seven concerns included in your petition as listed above.

The NRC staff position regarding the adequacy of the applicant's aging management programs, aging management review, and assessment of the RPV through the subsequent period of extended operation, as represented in the July 22, 2019, Safety Evaluation Report (SER) for the Turkey Point Subsequent License Renewal (ADAMS ML19191A054), considered your concerns and supports approval of the Turkey Point SLR. The 2019 SLR SER review of the Turkey Point RPVs includes:

- Section 3.0.3.1.3, "Reactor Vessel Material Surveillance," which discusses the staff's review of Turkey Point's approach to monitoring the changes in fracture toughness to the ferritic reactor vessel beltline materials by withdrawing and testing of a surveillance capsule and includes discussion of the availability of standby capsules in both RPVs.
- Section 3.1, "Aging Management of Reactor Coolant System" which discusses the staff's review of the Turkey Point aging management of the reactor coolant system.
- Section 4.2, "Reactor Vessel Neutron Embrittlement Analysis" which includes the NRC Staff analysis of pressurized thermal shock (4.2.2), upper shelf energy (4.2.3), and adjusted reference temperature (4.2.4) which are all associated with neutron embrittlement of the RPV through 80 years of operation.

The following is additional background on RPV assessment at Turkey Point:

- Your petition describes that the Turkey Point RPVs are made of stainless steel. The Turkey Point RPVs are actually fabricated of low-alloy steel with austenitic stainless steel cladding on internal surfaces which are exposed to reactor coolant. Instead of stainless steel cladding, the lower 15 ¾ inches of the lower shell is clad with nickel alloy.
- In 1985 the NRC approved an Integrated Surveillance Program (ISP) for Turkey Point Units 3 and 4 in accordance with Appendix H to 10 CFR Part 50 (ML17346A982). This approval permitted the reactor vessel material surveillance program for the 2 units to be combined into a single ISP for the site and includes data sharing.
- Additionally, Turkey Point participates in an ISP that supports the Babcock & Wilcox designed operating plants and those Westinghouse-designed operating plants that have Babcock & Wilcox fabricated reactor vessels. The latest revision of this ISP was approved in 2018 (ML1884A520) and allows "data sharing." Turkey Point's participation in this program is only to supplement the data provided by its site-specific Integrated Surveillance Program. The use of surveillance data from a different plant to supplement a surveillance program at a particular plant or site is required for PWR plants by the pressurized thermal shock (PTS) rule (10 CFR 50.61), to ensure the most accurate estimates of RPV embrittlement.
- The parameters that influence embrittlement (i.e., neutron fluence, neutron spectrum, irradiation temperature, and material chemistry) are well understood and are part of the NRC staff's review of plant-specific RPV embrittlement estimates. Other factors raised in the petition, such as transient behavior during emergency shutdowns or

Enclosure

“SCRAMS,” have no discernable impact on the ability of surveillance specimens from one plant to provide relevant data to assess radiation embrittlement of another plant, since the elastic deformation of the RPV steel due to such evolutions does not affect the degree of embrittlement.

SUBJECT: LTR-23-0216-1 - 2.206 PETITION FOR LICENSE RENEWAL PLANT REACTOR PRESSURE VESSEL EMBRITTLEMENT (EPID L-2023-CRS-0005) DATED JANUARY 22, 2023

DISTRIBUTION: LTR-23-0216-1

PUBLIC	RidsOgcMailCenter Resource
PM File Copy	RidsOpaMail Resource
RidsEdoMailCenter Resource	RidsRgn1MailCenter Resource
RidsNrrOd Resource	RidsRgn2MailCenter Resource
RidsNrrDorl Resource	RidsRgn3MailCenter Resource
RidsNrrDorlLpl1 Resource	RidsRgn4MailCenter Resource
RidsNrrDorlLpl2-1 Resource	JHeisserer, NRR
RidsNrrDorlLpl2-2 Resource	OYee, NRR
RidsNrrDorlLpl3 Resource	JTsao, NRR
RidsNrrDorlLpl4 Resource	EHaywood, NRR
RidsNrrDnrlNvib Resource	JHammock, NRR
RidsNrrDnrlNlrp Resource	JKim, NRR
RidsNrrLARButler Resource	PBuckberg, NRR
RidsNrrMailCenter Resource	NJordan, NRR
RidsR1DorsPb2 Resource	DKing, NRR
RidsOcaMailCenter Resource	DWillis, OE

ADAMS Accession Nos.: ML23262A761 (Package); ML23341A210 (Letter) NRR-106

OFFICE	NRR/DORL/LPL2-2/PM	NRR/DORL/LPL2-2/LA	NRR/DNRL/NVIB	NRR/DNRL/NVIB
NAME	PBuckberg	RButler	OYee	JTsao
DATE	12/7/2023	12/12/2023	12/14/2023	12/13/2023
OFFICE	NRR/DNRL/NVIB	NRR/DNRL/NLRP	OGC – NLO	NRR/DORL/LPL2-2/BC
NAME	EHaywood	JHammock	RCarpenter	DWrona
DATE	12/13/2023	12/13/2023	12/18/2023	1/2/2023
OFFICE	NRR/DORL/DD	NRR/D	NRR/DORL/DD	
NAME	JHeisserer	AVeil (MKing for)	JHeisserer	
DATE	1/8/2023	1/18/2023	1/22/2023	

OFFICIAL RECORD COPY