

September 11, 2024

Michael Frankovich, Acting Deputy Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: *2.206 Petition Regarding Seismic Core Damage Frequency for Diablo Canyon Nuclear Power Plant, Units 1 and 2 (EPID L-2024-CRS-0000)*

Dear Mr. Frankovich:

Thank you for your letter of August 27, 2024 on behalf of the U.S. Nuclear Regulatory Commission's ("NRC's") Petition Review Board ("PRB"), which accepts for further inquiry a set of seismic safety concerns raised by San Luis Obispo Mothers for Peace, Friends of the Earth, and the Environmental Working Group ("Petitioners") regarding the Diablo Canyon Nuclear Power Plant ("DCPP").¹ We greatly appreciate the PRB's commitment to investigate assertions by Petitioners' seismic expert, Dr. Peter Bird, that omissions and deficiencies in Pacific Gas and Electric Co.'s ("PG&E's") earthquake risk analysis have underestimated seismic core damage frequency ("SCDF") by a factor of forty (40). Taking into account the higher recurrence rate of thrust faults under and near DCPP, estimated SCDF increases from 3×10^{-5} /year (PG&E) to 1.4×10^{-3} /year (Bird).²

As stated in the NRC's internal procedures for 2.206 petitions, the NRC must "[e]nsure public health and safety through the prompt and thorough evaluation of any potential problem"³ raised by an enforcement proceeding. The "potential problem" raised by Petitioners is extremely grave: a reactor accident probability of one in a thousand per year is seriousness enough to warrant the most rigorous enforcement action, including shutdown of the facility.⁴ To conduct its evaluation with the level of rigor that is warranted by these circumstances, we urge you to implement the following procedural measures:

- A. Hold an adjudicatory hearing under the procedures set forth in 10 C.F.R. Part 2, including exchange of relevant documents, submission of written briefs and testimony, a live

¹ Letter from Michael Frankovich to Diane Curran, et al., re: *2.206 Petition Regarding Seismic Core Damage Frequency for Diablo Canyon Nuclear Power Plant, Units 1 and 2 (EPID L-2024-CRS-0000)* (Aug. 27, 2024) ("Acceptance Letter").

² Acceptance Letter at 1.

³ Management Directive 8.11, Review Process for 10 CFR 2.206 Petitions at 3 (March 1, 2019).

⁴ NRC Office Instruction LIC-504, Integrated Risk-Informed Decision-Making Process for Emergent Issues (Rev. 6, Sept. 7, 2023) (ML23165A117) ("LIC-504"). LIC-405 characterizes the "risk impact from external events" as "high" and therefore warrants "immediate regulatory action to place or maintain the facility in safe condition" if "[c]onditional core damage frequency (CCDF) (i.e., CDF because of the issue) is high (e.g., greater than or on the order of 1×10^{-3} /year). *Id.* at 4.

hearing with an opportunity to question witnesses or submit questions for the witnesses to the Presiding Officer, submission by the parties of proposed findings of fact and conclusions of law, and adequate time for a thorough review of the evidence;

- B. Allocate the burden of proof to PG&E and the NRC and not to Petitioners;
- C. Pursuant to 10 C.F.R. § 2.204, issue a Demand for Information to PG&E for important global positioning system (“GPS”) data;
- D. Require that the members of the PRB have not been involved in any previous NRC reviews in which the adequacy of PG&E’s seismic risk analyses was accepted;
- E. Require that the membership of the PRB include individuals with adequate training and experience to evaluate the seismic risk analyses presented by PG&E and Dr. Bird; and
- F. Establish a peer review panel for the PRB’s decision.

Discussion

As stated in your Acceptance Letter, the PRB accepted the following concerns for further inquiry:

1. Thrust faulting is neglected by [PG&E’s] 2012 Seismic Source Characterization (SSC) model because the model assumes that a majority of large earthquakes affecting Diablo Canyon are strike-slip and disregards the significant contribution of thrust faulting earthquake sources under the Diablo Canyon site and the adjacent Irish Hills. In addition, PG&E did not use a hanging-wall term for the modeling of potential ground motions from the Los Osos and San Luis Bay thrust faults.
2. The January 2024 magnitude 7.5 (moment magnitude) earthquake centered in the Noto Peninsula (Japan), with an average slip of 2 meters on the fault, is analogous to future potential thrust mechanism earthquakes beneath Diablo Canyon. Based on the slip rate of the Irish Hills adjacent to Diablo Canyon and the slip of the Noto earthquake, large thrust fault earthquakes will occur, on average, every 715 years near the Diablo Canyon site.
3. PG&E’s 2012 SSC model does not account for an inferred offshore thrust fault that has a slip rate of 2.8 millimeters per year (mm/yr) and the potential for producing a magnitude 7.5 earthquake.
4. Seismic core damage frequency, estimated by PG&E in 2018 to be 3×10^{-5} , should be 1.4×10^{-3} per year (about once every 715 years) based on this higher recurrence rate for thrust earthquakes.).⁵

⁵ Acceptance Letter at 1-2.

While your Acceptance Letter does not describe a process by which Petitioners' concerns will be addressed, a separate email from the PRB to Petitioners' counsel states that:

Once the PRB staff has completed its review of the concerns below, the PRB will consider whether enforcement action is warranted. The decision by the PRB will be documented in Proposed Director's Decision which will be sent to you for comment before issuance of a Final Director's Decision.⁶

We respectfully submit that such a cursory process is grossly inadequate to address the complexity, novelty and gravity of the issues raised by the Petitioners. Therefore, we respectfully urge you to implement the requested procedural measures, which have been recognized by the NRC Commissioners and/or the NRC Staff as appropriate to ensure that claims raised in 2.206 petitions are adequately considered. Given that that you have accepted the validity of Petitioners' claims as warranting a full inquiry, these steps are minimally necessary to ensure that our concerns are adequately addressed and resolved.

A. The PRB should hold an adjudicatory hearing under the procedures set forth in 10 C.F.R. Part 2, including exchange of relevant documents, submission of written briefs and testimony, a live hearing with an opportunity to question witnesses or submit questions for the witnesses to the Presiding Officer, submission by the parties of proposed findings of fact and conclusions of law, and provision of adequate time for a thorough review of the evidence.

For all relevant purposes, these circumstances fit the standard set by the Commission for conducting adjudicatory hearings in 2.206 proceedings.⁷ In *Indian Point*, the Commission found that a hearing was warranted to resolve issues raised in an enforcement petition by the New York Atomic Energy Council, because the petition raised "substantial safety issues" that affected all of the Indian Point units, including units that were not addressed by then-pending licensing proceedings.⁸ Here, as in *Indian Point*, Petitioners have raised substantial safety issues that will not be addressed in the pending license renewal proceeding for DCPD unless the Commissioners reverses a recent decision by the Atomic Safety and Licensing Board to reject the same technical

⁶ Email from Perry Buckberg, PRB, to Diane Curran, Hallie Templeton, and Caroline Leary re: Diablo Canyon Seismic Core Damage 2.206 petition – Accepted (Aug. 22, 2024).

⁷ *Consol. Edison Co. of New York* (Indian Point Units 1, 2, and 3), CLI-75-8, 2 N.R.C. 173 (1975) ("*Indian Point*").

⁸ *Id.*, 2 N.R.C. at 177.

claims as raised in this enforcement petition, on the grounds that they are precluded by NRC license renewal regulations.⁹

The only circumstance that differed in the *Indian Point petition* was that all parties agreed that a hearing was appropriate.¹⁰ However, Petitioners respectfully submit that agreement by the parties to a hearing is not a relevant consideration, because the PRB retains full authority to determine that a hearing is necessary for an adequate investigation into the technical issues raised by the Petitioners. Here, an adjudicatory hearing constitutes a method of “inquiry” that has already been demonstrated to be “appropriate to the facts”¹¹ in this proceeding. It is an unequivocal fact that the PRB would have denied Petitioners’ claims had it not been for the supplemental briefing by Petitioners, a live presentation by Dr. Bird in a July 17, 2024 meeting with the PRB, and the opportunity for PRB members to question Dr. Bird.

Therefore, the PRB should hold an adjudicatory hearing under the procedures of 10 C.F.R. Part 2, with exchange of relevant information by PG&E and the Petitioners, submission of written testimony and exhibits, an opportunity to submit questions to the Presiding Officer to be asked of witnesses.

B. Allocate the burden of proof to PG&E and the NRC and not to Petitioners.

Petitioners have met their burden of raising claims that warrant further inquiry by the PRB. This raises the question of who should carry the burden of proof in that inquiry. NRC Management Directive 8.11 is silent on the question. Petitioners respectfully submit that the burden of proof should be allocated to PG&E and the NRC, and not to Petitioners. While Petitioners are certainly willing and able to fully engage throughout the inquiry, the PRB should not rely exclusively on information provided by Petitioners, but should shift its focus on obtaining all relevant information from PG&E. As discussed in paragraph (C) below, relevant information includes GPS geodetic studies that have not been publicly disclosed.

C. Pursuant to 10 C.F.R. § 2.204, issue a Demand for Information to PG&E for important global positioning system (“GPS”) data.

The PRB should implement 10 C.F.R. § 2.204 to demand information from PG&E that would greatly assist the PRB in its evaluation: complete copies of any and all GPS geodetic studies (whether internal or contracted) dated 2015 or later that discusses/discuss the velocity/velocities

⁹ *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Plant, Units 1 and 2), LBP-24-06, ___ N.R.C. ___ (July 3, 2024). Petitioners’ appeal of LBP-24-06 is pending before the Commissioners.

¹⁰ *Indian Point*, 2 N.R.C. at 177.

¹¹ *Indian Point*, 2 N.R.C. at 175.

of geodetic benchmarks at/near Diablo Canyon Power Plant, or elsewhere on the southwest side of the Irish Hills.¹²

As described in ¶ 33 of the Supplemental Declaration of Peter Bird (June 7, 2024), GPS data constitutes “essential geophysical evidence” for understanding of seismic risk to DCP. Further, it has been used to successfully forecast seismicity.¹³ GPS receivers can be permanently installed, so that they determine (and record) their positions about once every second, for years or for decades. This collection of massive amounts of data allows the detection of very slow and subtle velocity differences between two GPS benchmarks, with precision of ± 0.1 mm/year. If the two benchmarks are moving closer together, this indicates (and quantifies) thrust-faulting somewhere between them. Thus, measurements of the long-term velocity of DCP relative to other GPS benchmarks on the North side of the Irish Hills would quantify the overall rate of thrust faulting (which Dr. Bird currently estimates as 2.0~2.8 mm/year.) Production of PG&E’s GPS studies would allow the PRB and parties to more accurately evaluate whether the rate of thrust faulting is the same, or greater, or smaller than estimated by Dr. Bird.

D. Require that the members of the PRB have not been involved in any previous NRC reviews in which the adequacy of PG&E’s seismic risk analyses was accepted.

NRC’s “Desktop Guide for implementing Management Directive 8.11 provides that: “to the extent practicable, the PRB should consider inclusion of members and support staff that are impartial to the issue and were not integral in formulating the staff’s position regarding the concerns raised in the petition.”¹⁴ Given that the NRC Staff has conducted multiple positive reviews of PG&E’s seismic analysis, it is essential that the PRB does not include individuals who may have an all-too-human propensity to defend their previous work. This independence is not just necessary for an adequate substantive outcome, but for the credibility of the entire review process. The PRB should address this issue in a communication to Petitioners.

E. Require that the membership of the PRB include individuals with adequate training and experience to evaluate the seismic risk analyses presented by PG&E and Dr. Bird.

¹² Petitioner San Luis Obispo Mothers for Peace has requested PG&E to produce these GPS studies in a separate proceeding before the California Public Utilities Commission (“CPUC”). If PG&E produces the information in that proceeding, this request will be moot, and Petitioners will so inform the PRB.

¹³ Bird, “Correcting 4 False Assumptions in PG&E’s Seismic Source Characterization [2015] and Update [2024] that Caused PG&E to Seriously Underestimate Seismic Hazard at Diablo Canyon Nuclear Power Plant,” slides 18, 20, 22 (July 17, 2024). *See also* Transcript of July 17, 2024 PRB Meeting at 32-25 and 52 (Bird).

¹⁴ Desktop Guide: Review Process for 10 CFR 2.206 Petitions, Change Notice at 9-10 (Nov. 8, 2021).

NRC's "Desktop Guide for implementing Management Directive 8.11 also provides that the PRB "may solicit the support of external contractors for complex issues when it determines that the staff expertise and diversity of experience is limited."¹⁵ Given the novelty and complexity of the issues involved, the PRB should take all necessary steps to ensure it has sufficient expertise to evaluate the issues. These additional members should be identified to Petitioners, with an opportunity to raise concerns about their qualifications.

F. Establish a peer review panel for the PRB's decision.

Finally, NRC's "Desktop Guide for implementing Management Directive 8.11 provides that the PRB may "incorporate peer reviews, as appropriate, to obtain potential alternative perspectives on technical analysis, particularly for those petitions requiring additional analysis."¹⁶ Petitioners respectfully submit that this 2.206 proceeding meets the standard for peer review, due to the divergence of positions between Dr. Bird and PG&E's experts on the nature and severity of seismic risk at DCP, and due to the complexity and novelty of the issues involved. Peer reviewers should be independent of the NRC and PG&E, should be familiar with the relevant literature, and have a degree of scientific expertise and rigor that is sufficient to enable them to credibly comment.

¹⁵ *Id.* at 10.

¹⁶ *Id.*

Thank you for considering these proposed measures, which are minimally necessary to ensure an adequately rigorous and thorough review of the concerns raised by the Petitioners.

Sincerely,

/signed electronically by/

Diane Curran

Harmon, Curran, Spielberg, & Eisenberg, L.L.P.

1725 DeSales Street N.W., Suite 500

Washington, D.C. 20036

240-393-9285

dcurran@harmoncurran.com

Counsel to San Luis Obispo Mothers for Peace

/signed electronically by/

Hallie Templeton

Friends of the Earth

1101 15th Street, 11th Floor

Washington, DC 20005

434-326-4647

htempleton@foe.org

Counsel to Friends of the Earth

/signed electronically by/

Caroline Leary

Environmental Working Group

1250 I St N.W.

Washington, DC 20005

202-667-6982

cleary@ewg.org

Counsel to Environmental Working Group