

May 18, 2015

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

In the matter of  
Pacific Gas and Electric Company  
Diablo Canyon Nuclear Power Plant  
Units 1 and 2

Docket Nos. 50-275-LR  
50-323-LR

**SAN LUIS OBISPO MOTHERS FOR PEACE’S REPLY TO  
APPLICANT’S AND NRC STAFF’S OPPOSITIONS TO  
MOTION TO FILE NEW CONTENTIONS REGARDING ADEQUACY OF  
SEVERE ACCIDENT MITIGATION ALTERNATIVES ANALYSIS  
FOR DIABLO CANYON LICENSE RENEWAL APPLICATION**

**I. INTRODUCTION**

Pursuant to 10 C.F.R. § 2.309(h), San Luis Obispo Mothers for Peace (“SLOMFP”) hereby replies to Pacific Gas and Electric Company’s Answer Opposing Proposed SAMA Contentions (May 11, 2015) (“PG&E Answer”) and NRC Staff Answer to San Luis Obispo Mothers for Peace’s Motion to File New Contention Regarding the Adequacy of the Severe Accident Mitigation Alternatives Analysis for Diablo Canyon (May 11, 2015) (“NRC Staff Answer”). Their arguments in opposition to San Luis Obispo Mothers for Peace’s Motion to File New Contention Regarding the Adequacy of the Severe Accident Mitigation Alternatives Analysis for Diablo Canyon License Renewal Application (April 15, 2015) (“SLOMFP Motion”) are without merit and therefore the contentions should be admitted.

**II. DISCUSSION**

**A. Contention C**

In Contention C (Inadequate Consideration of Seismic Risks in SAMA Analysis), SLOMFP asserts that PG&E’s SAMA Analysis is inadequate to satisfy NEPA because it proposes to rely on the “results” of PG&E’s recently-submitted and seriously deficient post-

Fukushima seismic risk analysis for its evaluation of the cost-effectiveness of measures to mitigate earthquake impacts. The contention states:

PG&E's SAMA Analysis (Appendix F of PG&E's Amended ER) is inadequate to satisfy the National Environmental Policy Act ("NEPA") or NRC implementing regulation 10 C.F.R. § 51.53(c)(ii)(L) because PG&E's evaluation of potential mitigation measures is not based on a sufficiently rigorous or up-to-date analysis of seismic risks. As a result, PG&E's evaluation of the comparative costs and benefits of measures to prevent or mitigate the effects of a severe earthquake does not sufficiently credit the cost-effectiveness of mitigation measures.

While PG&E claims that the "results and insights" of its 2014 "interim" probabilistic risk analysis ("PRA") (labeled "DCO3") are "reasonable for the purposes of a SAMA analysis" (Amended ER at F-34), by PG&E's own admission, DCO3 is only an "interim" PRA. *Id.* In addition, it is not sufficiently rigorous or updated to support the SAMA analysis.

Nor does PG&E's promise to "update" the DCO3 with the "results" of its 2015 seismic hazards analysis<sup>3</sup> cure the inadequacy of DCO3 to support PG&E's SAMA Analysis, because PG&E's 2015 seismic hazards analysis is also insufficiently rigorous and relies on outdated or unjustified methods and assumptions. Given the inadequacies of PG&E's seismic hazards analysis, to merely cite its "results" in a revised SAMA Analysis would not be sufficient to ensure the adequacy of the SAMA Analysis to evaluate potential mitigation measures for severe seismic accidents. Instead, PG&E must cure the significant defects in the underlying data and analyses.

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<sup>3</sup> PG&E's 2015 seismic hazards analysis consists of two documents: Pacific Gas and Electric Co., Seismic Hazard and Screening Report, Diablo Canyon Power Plant Units 1 and 2 ("SHS Report"), submitted by letter from Barry S. Allen, PG&E to NRC, re: Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding the Seismic Aspects of Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident: Seismic Hazard and Screening Report (Mar. 11, 2015); and PG&E's Seismic Source Characterization for the Diablo Canyon Power Plant, San Luis Obispo County, California; report on the results of a SSHAC level 3 study (Rev. A, March 2015) ("SSC Report").<sup>1</sup>

SLOMFP Motion at 2-3.

PG&E first argues that SLOMFP does not provide any reasons to dispute PG&E's assertion in the Amended Environmental Report that the "results and insights" of the

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<sup>1</sup> Contention C is supported by the Declaration of Dr. David D. Jackson, Professor of Geophysics Emeritus at the University of California at Los Angeles.

probabilistic risk assessment (“PRA”) model used by PG&E are “reasonable for the purposes of a SAMA analysis.” PG&E Answer at 7. While conceding that the PRA is an “interim” document, PG&E argues that it was based on the “latest” information available at the time, and therefore was sufficient for NEPA purposes. *Id.* Accordingly, PG&E claims that NEPA allows it to “draw the line and move forward with decisionmaking” based on available information. PG&E Answer at 7-8 (citing *Town of Winthrop v. Federal Aviation Administration*, 535 F.3d 1, 12-13 (1st Cir. 2008); *The Lands Council v. McNair*, 537 F.3d 981, 1003 (9th Cir. 2008)).<sup>2</sup> But the information in the seismic hazards analysis is available now, at least ten years before PG&E’s operating license is due to expire.<sup>3</sup> And unlike the circumstances of *Town of Winthrop* and *The Lands Council*, the NRC considers PG&E’s seismic hazards analysis to be extremely significant with respect to the safety of operating Diablo Canyon: in a recent letter to western reactor licensees, the NRC identified Diablo Canyon as one of the U.S. reactors with “the highest re-evaluated hazard relative to the original plant seismic design-basis” and gave it maximum priority for further seismic studies. Letter from NRC to Power Reactor Licensees on the Enclosed List re: Screening and Prioritization Results for the Western United States Regarding Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Seismic Hazard Re-Evaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights From the Fukushima Dai-ichi Accident (May 13, 2015) (ADAMS Accession No.

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<sup>2</sup> In this context, PG&E mischaracterizes Contention C, claiming it asserts that PG&E should update its PRA with PG&E’s “2014 Seismic Imaging Project Report,” a deterministic study that “does not directly correlate to the PRA.” PG&E Answer at 8. In fact, SLOMFP’s contention asserts that: “[w]hile PG&E claims to have relied on the ‘latest hazard spectral information’ for its 2013 update to the Turbine Building Shear Wall fragility, that information does not include *the 2015 SHS Report or the 2015 SSC Report*; and therefore the spectral information is not, in fact, the ‘latest.’” SLOMFP Motion at 5. The contention makes no assertions about the role of the Seismic Imaging Project Report in PG&E’s SAMA analysis.

<sup>3</sup> The operating license for Unit 1 will expire in 2024 and the operating license for Unit 2 will expire in 2025.

ML15113B344). The clearly established significance of the seismic hazards evaluation, coupled with PG&E's characterization of its existing PRA as "interim" and its statement that it intends to update the PRA with the results of the seismic hazards evaluation, raises a genuine and material dispute as to whether PG&E must follow through on its expressed intention in order to satisfy NEPA. It is not appropriate, at the contention admissibility stage, to judge the merits of the dispute. *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-11-11, 74 NRC 427, 443 (2011); *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-02-17, 56 NRC 1, 9-10 (2002).<sup>4</sup>

PG&E and the NRC Staff also argue that it is premature for SLOMFP to challenge the adequacy of PG&E's seismic hazards evaluation to support the SAMA analysis because PG&E intends to submit an evaluation of whether the seismic hazards evaluation warrants changes to the SAMA analysis in June. PG&E Answer at 9, NRC Staff Answer at 12. PG&E asserts that at that point, "SLOMFP would have the opportunity to substantively challenge that updated analysis based on any new information presented at the time." PG&E Answer at 9 n.35. PG&E has stated only that it will apply the "results" of the seismic hazards evaluation to the SAMA analysis (Amended Environmental Report at F-34), however, leaving unanswered the question of whether the adequacy of the underlying data and analyses will be considered appropriate subjects for a timely contention at that point.

Thus, in abundance of caution, Contention C raises a dispute regarding the reasonableness of PG&E's intention to limit its updated SAMA analysis to the "results" of the Seismic Hazards Analysis in light of serious deficiencies in the underlying data and analyses.

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<sup>4</sup> While the NRC Staff asserts that "the issue raised by the intervenor will be cured shortly" by PG&E's anticipated June 2015 submittal of an updated SAMA analysis (NRC Staff Answer at 12), the contention will only be mooted if and when PG&E makes the submittal.

SLOMFP may amend Contention C when PG&E files its final SAMA analysis in June. In the meantime, however, Contention C is timely and admissible.

PG&E and the Staff also contend that Contention C is outside the scope of the license renewal proceeding because it relates to a different regulatory process, the NRC's review of post-Fukushima safety issues under 10 C.F.R. § 50.54(f) for purposes of updating the current licensing basis ("CLB"). PG&E Answer at 10-11, NRC Staff Answer at 16. As the Commission has recognized however, the Atomic Energy Act "does not limit NEPA." *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-01-17, 54 NRC 3, 13 (2001).<sup>5</sup> NEPA requires that information that is relevant to the environmental analysis for a proposed licensing decision must be considered unless the NRC is excused by another statute. *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016, 1034-35 (9th Cir. 2006).<sup>6</sup>

Both PG&E and the NRC Staff raise a number of objections to the portion of Contention C that challenges the adequacy of the data and analyses underlying the seismic hazards evaluation. First, they argue that SLOMFP has not provided enough information about the specific relationship between the problems with the seismic hazards evaluation and the SAMA

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<sup>5</sup> PG&E cites two NRC decisions for the proposition that "[t]he license renewal evaluation of alternatives under NEPA is not a regulatory 'worm hole' that allows litigation of a current CLB issue already being addressed in a Part 50 process." PG&E Answer at 11 n.44 (citing *Florida Power and Light Co.*, CLI-01-17; *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), LBP-15-6, \_\_ NRC \_\_ (slip op. at 8-9)). But both of these decisions concern the NRC's interpretation of the Atomic Energy Act, not NEPA. Therefore they don't apply to this NEPA proceeding.

<sup>6</sup> For instance, in *Duke Energy Corp.*, the Commission affirmed the admission of a contention that a SAMA analysis for renewal of a reactor should have considered the results of a study prepared by Sandia National Laboratories for completely different purposes. CLI-02-17, 56 NRC at 9-10.

analysis. PG&E Answer at 11, NRC Staff Answer at 15-16.<sup>7</sup> But they miss the point of the contention, which is to challenge PG&E’s implied assertion that it will be sufficient to apply the “results” of the seismic hazards evaluation to the SAMA analysis, without addressing defects in the underlying data and analyses. As the Staff recognizes, NEPA requires that mitigation must be “discussed in ‘sufficient detail to ensure that environmental consequences [of the proposed project] have been fairly evaluated.’” NRC Staff Answer at 9 (citing *Duke Energy Corp.*, CLI-02-17, 58 NRC at 431 (quoting *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 353 (1989) (alteration in original))). To discuss only the results of the seismic hazards evaluation in the SAMA analysis, without addressing the significance of available relevant data and without using more accurate current analytical methods, would distort and underestimate the earthquake-related environmental consequences of renewing the operating license for Diablo Canyon.

Next, PG&E contends that Contention C does not raise a genuine and material dispute with PG&E because “Dr. Jackson’s views were considered” by the Senior Seismic Hazard Analysis Committee (“SSHAC”), a panel of consultants hired by PG&E to review the seismic hazards analysis. PG&E Answer at 11. The Staff also argues that consideration of Dr. Jackson’s views by the SSHAC is sufficient to satisfy NEPA. NRC Staff Answer at 16. The fact that PG&E’s own consultants rejected Dr. Jackson’s views does not demonstrate that the contention is inadmissible, however. To the contrary, it shows the existence of a dispute between PG&E and SLOMFP pursuant to 10 C.F.R. § 2.309(f)(2). Dr. Jackson has demonstrated that the

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<sup>7</sup> PG&E also argues that SLOMFP was required to propose “alternative inputs that . . . PG&E should have used in the updated SAMA analysis.” PG&E Answer at 8. But criticisms of the details of a SAMA analysis are not required where a contention asserts that significant information has been omitted from the analysis as a whole. *Pacific Gas and Electric Co.*, CLI-11-11, 74 NRC at 442-43. SLOMFP contends that PG&E omitted the seismic hazards analysis from the SAMA analysis; and by asserting that in the future it will address only the “results” of the seismic hazards analysis in the SAMA analysis, PG&E effectively promises to omit consideration of relevant data and methodologies.

environmental consequences of renewing the Diablo Canyon operating license – in the form of earthquake risks – have not been “fairly evaluated.” *Duke Energy Corp.*, CLI-02-17, 58 NRC at 431.<sup>8</sup>

Finally, both PG&E and the Staff contend that Dr. Jackson presents one view among many possible and equally acceptable views regarding the appropriate method for evaluating earthquake risks at Diablo Canyon; and therefore his differences with PG&E do not rise to the level of a valid NEPA claim. PG&E Answer at 11 n.43, NRC Answer at 17 and n.86 (citing *Entergy Nuclear Generation Co. and Entergy Nuclear Operations, Inc.* (Pilgrim Nuclear Power Station), CLI-12-15, 75 NRC 704, 714 (2012)). But Dr. Jackson expresses more than a mere preference for one method over another. Instead, he specifically identifies a number of aspects in which PG&E’s seismic hazards evaluation overlooks or mischaracterizes relevant data regarding earthquake risks and is inconsistent with current methodology used in the field. PG&E’s seismic analysis thus fails to meet NEPA’s requirement for the “best available information.” *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), LBP-13-13, 78 NRC 246, 473 (2013).<sup>9</sup> In particular, the contention provides a detailed demonstration of the

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<sup>8</sup> PG&E’s attorneys – without the support of an expert declaration -- make a number of technical arguments to the effect that “the concerns raised in Contention C have minimal consequences for the overall site-specific probabilistic seismic hazard analysis for Diablo Canyon.” PG&E Answer at 11 n.43. In addition to lacking qualified expert support, these arguments impermissibly go to the merits of Contention C, not its admissibility. Therefore they are not appropriate at this stage of the proceeding. *Pacific Gas and Electric Co.*, CLI-11-11, 74 NRC at 443; *Duke Energy Corp.*, CLI-02-17, 56 NRC at 9-10.

<sup>9</sup> Nor does PG&E satisfy the NRC’s standard for the seismic hazards evaluation that: “Any new or updated seismic hazard assessment *should consider all relevant data, models, and methods* in the evaluation of seismic sources and ground motion models.” Request for Information Pursuant to Title 10 of the Code of Federal Regulations, 50.54(f) Regarding Recommendations 21.1, 2.3, and 9.3 of the Near-Term Task Force Review of Insights From the Fukushima Dai-ichi Accident, Attachment 1 to Seismic Enclosure 1 (March 12, 2012) (ML12053A340) (emphasis added).

ways in which PG&E has failed to account for nearby earthquakes and potential large earthquakes. SLOMFP Motion at 6-12. For instance, the contention states that PG&E:

wrongly assumes that major earthquakes are located exactly on simplified versions of mapped fault traces. While PG&E considers alternative versions of fault geometry models (FGMs) for some faults (see SSC Report, section 6.3.1), PG&E makes no provision for large off-fault earthquakes. Smaller earthquakes are accounted for in the Areal Source Zones, but their magnitudes are limited to 6.8 or 6.9 in the Local Areal Zone (see SSC Report, Figure 14-1), most relevant to seismic hazard. *PG&E disregards that fact that earthquakes larger than those limits could occur within the Local Areal Zone, causing strong ground motion not yet accounted for.*

SLOMFP Motion at 6 (emphasis added). The contention further asserts that:

As a result of PG&E's outdated and non-conservative assumptions about the location of earthquakes, the hazard curves in the SSC Report underestimate the shaking that may be caused by nearby earthquakes. The amount of PG&E's underestimate is potentially significant, and therefore must be evaluated by further study before PG&E may reasonably rely on the SSC Report's results in its SAMA Analysis.

SLOMFP Motion at 7. SLOMFP also demonstrates that PG&E's analysis of the potential size of earthquakes is based on discredited methodology and ignores the lessons of major earthquakes that have occurred in the past 25 years. *Id.* at 11. While Dr. Jackson has an extremely high level of expertise that would qualify him to draw reliable conclusions without reference to other experts, in this case his point is that PG&E is ignoring commonly available information and commonly accepted methods relied on by other authorities, including the Uniform California Earthquake Rupture Forecast (“UCERF3”) and the SHARE project in Europe. His expert analysis also demonstrates that the information and methods ignored by PG&E constitute the “best available information,” and therefore should be considered in the SAMA analysis. *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), LBP-13-13, 78 NRC 246, 473 (2013). Under the circumstances, the unexamined “results” of PG&E’s seismic hazards evaluation would distort and underestimate the environmental impacts of operating Diablo Canyon in the proposed

renewal term, and thereby result in the underestimation of the cost-effectiveness of mitigation measures. Therefore the contention should be admitted.

**B. Contention D**

Contention D (Inadequate Discussion of Flooding Risk in SAMA Analysis) asserts that the SAMA Analysis wrongly fails to consider flooding risks to safety equipment posed by “local intense precipitation” or “LIP flooding events.” These LIP flooding risks were identified in PG&E’s own post-Fukushima flood hazard analysis. The contention asserts:

PG&E’s SAMA Analysis (Appendix F of PG&E’s Amended ER) is inadequate to satisfy NEPA or NRC implementing regulation 10 C.F.R. § 51.53(c)(3)(ii)(L) because PG&E’s evaluation of potential severe accident mitigation measures is not based on a sufficiently rigorous or up-to-date analysis of flooding risks. As a result, PG&E’s evaluation of the comparative costs and benefits of measures to prevent or mitigate the effects of a severe earthquake does not sufficiently credit the cost-effectiveness of mitigation measures. In particular, PG&E failed to consider information about the risk of flooding of DCNPP safety equipment caused by local intense precipitation (“LIP”) flooding events, as presented in PG&E’s post-Fukushima flooding analysis. Letter from Barry Allen, PG&E, to NRC, re: Final Response to Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 Flooding (March 11, 2015), Enclosure 1: Diablo Canyon Power Plant Units 1 and 2 Flood Hazard Reevaluation Report In Response to 50.54 Information Request Regarding Near-Term Task Force Recommendation 2.1 (“Flood Hazard Reevaluation Report”).

SLOMFP Motion at 16.

PG&E and the Staff argue that mitigation of flooding caused by local intense precipitation is already being addressed as a current operating issue. PG&E Answer at 12, NRC Staff Answer at 22. As discussed above, however, the Atomic Energy Act does not limit NEPA. *Florida Power and Light Co.*, CLI-01-17, 54 NRC at 13. The fact that PG&E has committed to mitigate local intense precipitation events contradicts other arguments by PG&E and NRC to the effect that the Section 50.54(f) analysis is deterministic and therefore not comparable to the probabilistic SAMA analysis, or that PG&E previously considered intense precipitation and found that it will not cause safety-related buildings to flood. Having recognized the need to

mitigate local intense flooding in the safety context, PG&E should also address it in the NEPA context of the SAMA analysis.

### **III. CONCLUSION**

For the foregoing reasons, the ASLB should admit SLOMFP's contentions C and D.

Respectfully submitted,

*[Electronically signed by]*

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**UNITED STATES OF AMERICA  
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**SAN LUIS OBISPO MOTHERS FOR PEACE  
CERTIFICATE OF SERVICE**

I certify that on May 18, 2015, I posted on the NRC's Electronic Information Exchange SAN LUIS OBISPO MOTHERS FOR PEACE'S REPLY TO APPLICANT'S AND NRC STAFF'S OPPOSITIONS TO MOTION TO FILE NEW CONTENTIONS REGARDING ADEQUACY OF SEVERE ACCIDENT MITIGATION ALTERNATIVES ANALYSIS FOR DIABLO CANYON LICENSE RENEWAL APPLICATION. It is my understanding that as a result, the NRC Commissioners, Atomic Safety and Licensing Board, and parties to this proceeding were served.

Respectfully submitted,

*Electronically signed by*

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