

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

_____)	Docket Nos. 50-275, 50-323
In the Matter of)	
PACIFIC GAS & ELECTRIC COMPANY)	ASLBP No. 15-941-05-LA-BD01
)	
(Diablo Canyon Power Plant, Units 1 and 2))	June 19, 2015

PETITIONER FRIENDS OF THE EARTH'S SUPPLEMENTAL BRIEF

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INTRODUCTION

Pursuant to the June 12, 2015 Order of the Atomic Safety and Licensing Board (Board), Petitioner Friends of the Earth (FoE) submits this Supplemental Brief to aid the Board in its determination whether the Nuclear Regulatory Commission Staff (Staff) has *de facto* amended the licenses for Diablo Canyon Power Plant (Diablo Canyon) and in support of its Petition to Intervene and Request for Hearing.¹

Since FoE filed its Petition, several events have occurred that bear on the question whether the Staff has *de facto* amended licenses for Diablo Canyon. These events are: (1) public disclosure that the licensee, Pacific Gas & Electric (PG&E), at the Staff's direction, had made changes to the seismic design basis through Revision 21 of the Final Safety Analysis Report (FSARU), which were then endorsed by the Staff; (2) the release of the Central Coastal California Seismic Imaging Project report ("CCCSIP Report"), along with an Operability Determination and subsequent Staff Inspection Report showing that seismic hazard surrounding the plant exceeds the plant's seismic design basis; (3) the March 2015 Seismic Hazard and Screening Report ("March 2015 Report")² reaching a similar conclusion; and (4) a letter from the Staff to PG&E authorizing the licensee to continue operating while performing additional seismic analysis, even though the new seismic information "exceeds the design basis."

These events demonstrate that the Staff has taken action that grants greater operating authority by augmenting the plant's seismic design basis. Throughout this proceeding, both the Staff and the licensee have maintained that the 1977 Hosgri evaluation spectrum provides the

¹ Petition to Intervene and Request for Hearing by Friends of the Earth (Aug. 26, 2014).

² PG&E Letter DCL-15-035, 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, Encl. 1 (Mar. 11, 2015) (ML15070A607) ("March 2015 Report").

plant's outer limits for seismic hazard. Even if this were assumed to be true (which it is not)³, both the CCCSIP and March 2015 reports issued since the Petition was filed indicate that the reevaluated seismic hazard exceeds the Hosgri evaluation. Through (1) approving changes to the design basis made in FSARU Revision 21, (2) a Staff Inspection Report approving of the new methods of analysis used in the CCCSIP Report, and (3) a letter from Staff to PG&E,⁴ the Staff has expanded the authority granted to PG&E by its licenses. By directing PG&E to take actions that are not authorized by the plant's licenses, and then endorsing those actions, the Staff has *de facto* amended the licenses without the required amendment process.

By its actions the Staff has attempted to work around the public adjudicatory process required by section 189a of the Atomic Energy Act (AEA)⁵ and NRC implementing regulations⁶ for license amendments. In addition to violating the law, the failure to engage in the required process in this instance neuters the public participation demanded by the AEA.

ARGUMENT

I. By Augmenting the Seismic Design Basis to Include an Extra-Design Basis Ground Motion Response Spectrum, the NRC Staff Has Granted PG&E Additional Authority, Thereby *De Facto* Amending Diablo Canyon's Operating Licenses

The latest seismic report issued by PG&E, the March 2015 Report, concludes that the reevaluated ground motion response spectrum (GMRS) exceeds the design basis for the plant.

Thus PG&E is unable to comply with important conditions in the plant's operating licenses. Yet

³ The Double Design Earthquake continues to be the "safe shutdown earthquake" for purposes of satisfying General Design Criterion 2. FSARU, Revision 21, at 3.7-2. Nevertheless, FoE recognizes, of course, the Staff's position that the design basis for Diablo Canyon includes the Design Earthquake (DE), Double Design Earthquake (DDE), and, in addition, the Hosgri Evaluation (HE). The latest GMRS exceeds even the HE spectrum. March 2015 Report, Encl. 1 at 49 (ML15070A607).

⁴ NRC, Screening and Prioritization Results for the Western United States Sites 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) (ML15113B344) ("NRC Screen-In Letter").

⁵ 42 U.S.C. § 2239.

⁶ 10 C.F.R. § 50.91.

the Staff, purporting to act under its “oversight” authority, has endorsed augmenting the seismic design basis in the licenses to include this extra-design basis GMRS. By this action, the Staff grants additional authority to PG&E beyond that contained in the plant’s licenses, thus *de facto* amending the licenses in violation of the AEA.⁷

A. The Staff Has Granted PG&E Greater Operating Authority by Augmenting the Plant’s Seismic Design Basis

PG&E submitted the March 2015 Report in response to the Staff’s request for information issued pursuant to 10 C.F.R. § 50.54(f) as part of the Commission’s post-Fukushima review.⁸ As part of its response, PG&E was required to develop a new GMRS. This GMRS yielded surprising and significant results: the reevaluated GMRS not only far exceeded the DDE, the plant’s equivalent of the “safe shutdown earthquake” (SSE), but also exceeded the 1977 Hosgri evaluation—the GMRS that PG&E and the Staff have repeatedly maintained was the “bounding” seismic analysis for Diablo Canyon.^{9, 10}

PG&E’s admission that the reevaluated GMRS exceeded Diablo Canyon’s design basis—a determination later endorsed by the Staff (see below)—is remarkable because it marks a retreat from the very basis of the Staff’s and PG&E’s claim that no license amendment is necessary even though numerous analyses have shown that geological faults surrounding the plant are more capable than assumed in the 1977 Hosgri evaluation GMRS.¹¹ Following previous

⁷ See *Omaha Public Power District* (Fort Calhoun Station, Unit 1), CLI-15-5, slip op. at 8 (Mar. 9, 2015) (noting “two key factors to consider when determining whether agency action constitutes a *de facto* license amendment: whether the agency action (1) granted the licensee any greater authority or (2) otherwise altered the original terms of the license”).

⁸ See March 2015 Report.

⁹ See, e.g., PG&E Answer to FoE Hearing Request (Oct. 6, 2014), at 10, 12, 18, 24, 25; Staff Answer to Petition to Intervene and Request for Hearing by Friends of the Earth (Oct. 6, 2014), at 9, 27, 31-32; see also March 2015 Report, Enclosure 1 at 49 (showing exceedance beyond 1977 Hosgri evaluation).

¹⁰ FoE disputes the assertion that the Hosgri evaluation is the seismic design basis bounding evaluation for the plant. See below section II.

¹¹ On February 11, 2015, this panel of the Board denied FoE’s Petition for Waiver and Petition to Intervene in the License Renewal proceeding for Diablo Canyon, on the basis that the arguments presented, relating in particular to

seismic evaluations, PG&E has asserted in each instance since at least 2011 that the new seismic information does not alter the design basis because the GMRS resulting from the seismic risk evaluation is “bounded” by the 1977 Hosgri evaluation or the 1991 LTSP spectrum.¹²

In a complete about-face, PG&E has now abandoned its attempt to maintain that either of these two spectra is the bounding seismic analysis. Instead, the licensee now appears to assert that another evaluation—not a ground motion response spectrum at all—is the “bounding” analysis for the plant. As the basis for concluding that the plant is safe, PG&E now says that the GMRS is bounded by the “LTSP Seismic Margin.”¹³ But this “seismic margin” is not a ground motion response spectrum; it simply adds a 35% design margin onto the Hosgri evaluation.¹⁴ In other words, PG&E now claims authority to respond to a demonstrated beyond-design basis risk, not by the license amendment process required under NRC regulations, but by simply reducing the safety margin that formed the basis for the Staff to grant PG&E the right to operate the plant.

By agreeing to allow PG&E to fold this extra-design basis evaluation into the existing design basis, thereby reducing the plant’s safety margin, the Staff has expanded the outer bounds of Diablo Canyon’s seismic design basis, effectively altering the terms of the plant’s licenses. Each nuclear power plant licensee, including PG&E, is required to comply with its current licensing basis at all times during plant operation.¹⁵ The seismic design basis contained in each

the CCCSIP Report, were outside the scope of a license renewal proceeding and could be considered in this *de facto* proceeding. Order at 16, No. 50-275-LR, 50-323-LR (Feb. 11, 2015) (ML15042A326).

¹² See, e.g., PG&E, Report on the Analysis of the Shoreline Fault Zone, Central Coastal California, at ES-2 (Jan. 7, 2011) (ML110140425). PG&E appears not to have evaluated the GMRS against the 1991 LTSP response spectrum in the March 2015 Report. Nonetheless, from visual inspections of PG&E’s GMRS Comparison graphs, it appears that the reevaluated GMRS exceeds the 1991 LTSP at least from approximately 1.0 to 2.0 hertz. PG&E Presentation to NRC Public Meeting, “Diablo Canyon Seismic Hazard Reevaluation,” at slides 55-57 (Apr. 28, 2015) (ML15117A069).

¹³ March 2015 Report at 6.

¹⁴ PG&E Fact Sheet, Diablo Canyon Power Plant, Seismic & Flooding Hazards Re-evaluation, http://www.pge.com/includes/docs/pdfs/safety/systemworks/dcpp/SeismicTsunami_fs.pdf.

¹⁵ 42 U.S.C. § 2131.

plant's FSARU, along with NRC regulations, is part of the plant's current licensing basis.¹⁶ Staff approval to operate outside of the seismic design basis therefore constitutes a revision of the terms of the plant's licenses and requires a license amendment.

Stated simply, PG&E and the Staff have recognized that the reevaluated GMRS exceeds the largest response spectrum developed for Diablo Canyon's design basis. Only by moving the goal posts—and in the process, changing the terms of the license by eroding the safety margin guaranteed by the license—can the Staff or PG&E maintain the illusion that the licenses for Diablo Canyon remain unaltered.

B. By Endorsing PG&E's Claim that No License Amendment is Necessary Based on the Licensee's Assertion that the "LTSP Seismic Margin" Bounds the Reevaluated GMRS, the Staff Has Altered the Terms of the Licenses and Granted PG&E Greater Authority than Contained in the Licenses

PG&E's March 2015 Report recognizes that the reevaluated GMRS is "beyond design basis."¹⁷ This would be so even if one assumed, *arguendo*, that the 1977 Hosgri evaluation were the bounding analysis for safe shutdown capability.¹⁸ On May 13, 2015, NRC determined, in a letter responding to the March 2015 Report, that the licensee had exceeded its design basis and, therefore, had "screened in" for additional evaluation under the post-Fukushima process (the "NRC Screen-in Letter").¹⁹ Rather than ordering a license amendment in response to this finding, the Staff gave PG&E an additional two years, until June 30, 2017, to conduct yet another seismic risk evaluation for Diablo Canyon; in the meantime, the plant is allowed to continue operating.²⁰ The Staff has endorsed PG&E's claim that no license amendment is needed even while admitting that the existing seismic hazard exceeds the plant's design basis. Since the plant is licensed to

¹⁶ NRC, "Inspection Manual, Part 9900: Technical Guidance," section 3.1 (ML081360529).

¹⁷ PG&E Presentation, at slide 60 (ML15117A069).

¹⁸ See 10 C.F.R. Part 50, App. A, General Design Criterion 2 (providing that structures, systems, and components "shall" be designed to withstand the "most severe of natural phenomena" and to take into account other criteria).

¹⁹ NRC Screen-In Letter (ML15113B344).

²⁰ *Id.* at 4.

operate only within the terms of its license, the Staff’s decision to allow continued operation can only be read as an alteration of the license, expanding PG&E’s authority to allow operation beyond the design basis of the license as it has existed previously.

Under the Commission’s case law, such a grant of additional authority is a *de facto* license amendment. The Commission has set forth “two key factors to consider when determining whether agency action constitutes a *de facto* license amendment: whether the agency action (1) granted the licensee any greater authority or (2) otherwise altered the original terms of the license.”²¹ The NRC Screen-in Letter enlarged the terms of Diablo Canyon’s licenses by augmenting the design basis to include new seismic data—a ground motion response spectrum that otherwise exceeded the design basis.

The Commission’s recent decisions in *Fort Calhoun* and *St. Lucie*²² are entirely consistent with FoE’s assertion that the Staff actions granting PG&E additional authority *de facto* amended Diablo Canyon’s licenses. In *Fort Calhoun*, the petitioner sought a hearing on license amendments “that it claims will be required” for the plant.²³ The Commission denied the petitioner’s request on two grounds. First, the Commission determined the request to be premature, finding that “the prospect of a possible future license amendment does not trigger hearing rights now.”²⁴ Second, the Commission rejected the petitioner’s argument that “unilateral licensee actions, unapproved by the NRC, [could] constitute *de facto* amendments,” finding instead that Staff action is necessary to *de facto* amend a license.²⁵

PG&E’s March 2015 Report and the Staff’s Screen-in Letter distinguish both of the deficiencies that caused the Commission to deny the petition in *Fort Calhoun*. The Screen-in

²¹ *Fort Calhoun*, CLI-15-5 at 8.

²² *Fla. Power & Light Co.* (St. Lucie Plant, Unit 2), CLI-14-11, slip op. (Dec. 19, 2014).

²³ *Fort Calhoun*, CLI-15-5 at 1 (emphasis supplied).

²⁴ *Id.* at 10.

²⁵ *Id.* at 8.

Letter to PG&E had the effect of augmenting the plain terms of the licenses' seismic design basis to include an extra-design basis response spectrum. The Screen-in Letter endorsed this approach, approving the augmentation of the seismic design basis, even though purportedly issued under the Staff's oversight authority. These events are real and based on Staff direction as opposed to the speculative and unilateral nature of the petitioner's contentions in *Fort Calhoun*.

The facts in *St. Lucie* are similarly distinguishable. In that case, the Commission denied the hearing request as untimely.²⁶ In doing so, the Commission relied in part on its well-established factors to determine whether a license has been *de facto* amended and found that the petitioner had failed to cite an agency action that triggered a hearing right because the Staff was simply reviewing the condition of the plant's steam generators.²⁷

Here, unlike in *St. Lucie*, the Staff directed the company to request a *de facto* amendment, and then approved the amendment without the opportunity for public involvement as required in the regulations. The Staff affirmatively directed PG&E to update its FSARU to incorporate new seismic data.²⁸ PG&E then did so, citing the Staff's directive as its authority to do so without a license amendment.²⁹ The Staff then issued an order determining that the new FSARU revision satisfied Commission regulations.³⁰ Meanwhile, in the post-Fukushima section 50.54(f) process, the Staff similarly directed PG&E to conduct a seismic hazard evaluation, which the licensee submitted in the March 2015 Report, the results of which showed that the plant could not comply

²⁶ *St. Lucie*, CLI-14-11 at 6, 11.

²⁷ *Id.* at 8-11.

²⁸ NRC letter, Diablo Canyon Power Plant – NRC Review of Shoreline Fault, at 2 (Oct. 12, 2012) (ML120730106) (“Therefore, the staff has concluded that the Shoreline scenario should be considered as a lesser included case under the Hosgri evaluation and the licensee should update the [FSAR], as necessary, to include the Shoreline scenario in accordance with the requirements of 10 CFR 50.71(e).”).

²⁹ UFSAR Change Request, DCCP Form 69-20108 (Response to FOIA Request 2015-0068), at 102 (Feb. 19, 2015) (attached as Exhibit 1) (“The proposed activity involves changes to the UFSAR that explicitly identify the licensing basis design requirements and their bases submitted to, and approved by, the NRC in docketed correspondence. . . . The changes are excluded from the requirement to perform a 10 CFR 50.59/72.48 review [because] the changes are . . . incorporation of information approved by the NRC as a result of a licensing amendment or other docketed correspondence.” (emphases supplied)).

³⁰ NRC, Memorandum from Peter J. Bamford to Michael T. Markley (June 23, 2014) (ML14022A120).

with its seismic design basis. The Staff then approved the plant's continued operation for *two years* notwithstanding these results, while the licensee worked on an additional evaluation. In short, the Staff (1) directed the licensee to alter the terms of the licenses, and then (2) approved those actions through a series of documents designated incorrectly as oversight documents. Thus, unlike in *Fort Calhoun* and *St. Lucie*, here the Staff has taken affirmative actions that alter the terms of Diablo Canyon's licenses.

C. The Post-Fukushima Process Under 10 C.F.R. § 50.54(f) is Not a Substitute for the Statutory Requirement to Comply With License Terms and Follow Statutorily Mandated Procedures In Order to Amend a License

The ongoing post-Fukushima section 50.54(f) process does not exempt the changes made to the licenses from the public participation requirements of the AEA. Preparing an additional seismic analysis does not authorize the licensee to operate outside of the design basis. Nothing in the Commission's orders issued pursuant to the section 50.54(f) process, nor anything in the Commission's regulations, permits a licensee to exceed its design basis and continue operation absent a license amendment. The effect of the licenses' terms continues unabated.

Moreover, describing the NRC Screen-in Letter and other Staff actions as "oversight" has no legal bearing on whether the actions amend *de facto* the plant's licenses. PG&E's and the Staff's arguments that oversight actions can never *de facto* amend a license is tautological and has been rejected by the Commission and federal courts. In *Citizens Awareness Network, Inc. v. U.S. Nuclear Regulatory Commission*, the U.S. Court of Appeals for the First Circuit noted that it was "manifestly arbitrary and capricious" for the Commission to "skirt" a statutory command and "then simply label[] its decision 'mere oversight.'"³¹ The First Circuit cited prior case law noting that "it is the *substance* of the NRC action that determines entitlement to a section 189a

³¹ *Citizens Awareness Network, Inc. v. NRC*, 59 F.3d 284, 293 (1st Cir. 1995); see *Fort Calhoun*, CLI-15-5 at 8 (noting that "agency actions not formally labelled [sic] as license amendments nevertheless can constitute *de facto* license amendments and accordingly trigger hearing rights for the public under Section 189a. of the AEA").

hearing, *not* the particular label the NRC chooses to assign to its action.”³² As repeatedly recognized by the courts, a *de facto* amendment is by definition an action taken with the effect of amending the license but characterized by the agency as taken pursuant to some non-licensing authority (such as oversight).³³

II. NRC Staff’s Direction to PG&E to Modify the FSARU to Include Shoreline as a Lesser Included Scenario Under the Hosgri Evaluation, and the Staff’s Subsequent Approval of the Modifications, *De Facto* Amends the Licenses

In October 2012, the Staff directed PG&E to insert the Shoreline Earthquake as a lesser included scenario under the Hosgri evaluation.³⁴ Following this direction, PG&E made this change, observable in Revision 21 to the FSARU.³⁵ The significant changes include (1) the insertion of the Hosgri Earthquake and the LTSP Earthquake analyses into section 2.5 of the FSARU, thereby effectively altering the SSE and seismic design basis for Diablo Canyon, and (2) the insertion of the Shoreline Fault Zone as a “lesser included scenario under Hosgri.”³⁶ Notably, PG&E cited the Staff’s directive to modify its FSARU as the basis for its conclusion that no license amendment request was necessary.³⁷ These seismic-related changes to the FSARU *de facto* amend the licenses because the Staff enlarged PG&E’s operating authority by directing the licensee to make the changes and then approving them.³⁸

³² *Id.* at 295 (citing *Mass. v. NRC*, 878 F.2d 1516, 1521 (1st Cir. 1989)) (emphases in original). Moreover, the court rejected the Commission’s argument that no “proceeding” had occurred under 42 U.S.C. § 2239(a)(1)(A) because the Commission had merely refused to prevent the licensee from exceeding the terms of its license. *Id.* at 294 n.10.

³³ *Sholly v. NRC*, 651 F.2d 780, 790-91 (D.C. Cir. 1980), *vacated on other grounds*, 459 U.S. 1194 (1983) (rejecting Commission’s argument that order permitting venting of radioactive gas was not a *de facto* license amendment).

³⁴ NRC Review of Shoreline Fault (Oct. 12, 2012) (ML120730106).

³⁵ These changes were first made public on September 10, 2014. *See* NRC, DPO Case File for DPO-2013-002 (Sep. 10, 2014) (ML14252A743). The “UFSAR Change Request” for section 2.5 of the FSAR describes the changes to that section as reflecting “the results of the Licensing Basis Verification Project review of the Seismology and Geology section and proposed enhancements.” Exhibit 1 at 3.

³⁶ FSARU, Rev. 21 at 2.5.3.10.3, p. 2.5-67.

³⁷ Exhibit 1, UFSAR Change Request at 102; *id.* at 106-112 (noting repeatedly that “[t]hese enhancements are derived from correspondence with the NRC, NRC regulatory documentation, and specific UFSAR text; therefore, a 10 CFR 50.59 Screen is not required”). As noted above, FoE obtained the UFSAR Change Request as part of a response to a FOIA request. As provided to FoE, the text on p. 106-112 is extremely small and difficult to decipher.

³⁸ NRC, Memorandum from Peter J. Bamford to Michael T. Markley (June 23, 2014) (ML14022A120).

The NRC’s Screen-In Letter prevents PG&E and the Staff from contending that the seismic risk to Diablo Canyon is “bounded” by the DDE and the Hosgri evaluation analyses, as described in the pre-Revision 21 FSARU. NRC statutory authority³⁹ and regulations⁴⁰ require public due process provided by a license amendment proceeding for changes in the seismic design basis of the plant. Thus the seismic-related changes to the FSARU directed by the Staff, and subsequently approved by the Staff, must be seen as a *de facto* amendment to the licenses, changing the terms of the license and enlarging PG&E’s operating authority.

A. Revision 21 to the FSARU Contains Changes to Diablo Canyon’s Seismic Design Basis to Include Hosgri and the LTSP Earthquakes as “Maximum Possible Earthquakes” and Thus De Facto Amends the Licenses

At the Staff’s direction and with its approval, changes made to the FSARU via Revision 21 changed the design basis of the plant by modifying the description of the maximum earthquake possible from (1) the DDE to (2) the DDE, Hosgri evaluation, or the LTSP spectrum for the purposes of establishing the parameters for meeting General Design Criteria 2 (GDC 2). This change to the disjunctive rather than the additive form alters the terms of the licenses and thus amounts to a *de facto* license amendment.

To understand how this change grants greater authority to PG&E, it may be helpful to outline the function of an FSARU and the seismic design basis. The initial FSAR, which supports an application for an operating license, specifies methods of analysis to be used to determine whether the plant can be safely operated. The seismic design basis, which is part of the plant’s current licensing basis, implements GDC 2, “Design Bases for Protection against Natural

³⁹ 42 U.S.C. § 2239; *see Citizens Awareness Network*, 59 F.3d at 294 (“[B]y its nature a license is presumptively an exclusive—not an inclusive—regulatory device. . . . Regulated conduct which is neither delineated, nor reasonably encompassed within delineated categories of authorized conduct, presumptively remains unlicensed.”).

⁴⁰ 10 C.F.R. § 50.91.

Phenomena.”⁴¹ The designation and analysis of the SSE satisfies GDC 2’s requirement that the plant can be safely shutdown in the event of the “maximum earthquake potential” on a capable earthquake fault within 75 miles of the facility.⁴²

Section 2.5 of the FSARU describes the seismology and geology of the plant site, which “guide[s] the regulatory staff in its evaluation of the acceptability of the sites and seismic design bases.”⁴³ Revision 21 not only added the Shoreline fault as a lesser included scenario under the Hosgri evaluation,⁴⁴ but it also added the Hosgri and LTSP evaluations to section 2.5, thus altering the foundation for the seismic design basis.

Prior to Revision 21, the Hosgri fault was only briefly mentioned in section 2.5.⁴⁵ Section 2.5.2.9 of Revision 20, titled “Maximum Earthquake,” did not include a description of the Hosgri fault as it did for other faults surrounding the plant. For other faults, but not for the Hosgri, Revision 20 described the distance from Diablo Canyon and magnitude of possible earthquakes for which certain plant structures, systems and components (SSCs) were certified to implement GDC 2 design basis requirements.

The changes made to the FSARU in Revision 21 include designating the DDE, and the Hosgri evaluation and LTSP earthquakes as the “maximum earthquakes” for the plant. Prior to this change, the DDE (0.4 g) had been the only “maximum earthquake” in the FSARU.⁴⁶ Revision 21 modifies the basis for seismic qualification of the plant by adding the Hosgri and LTSP earthquakes to the description of the site geology, thereby allowing PG&E to effectively

⁴¹ 10 C.F.R. Part 50, App. A.

⁴² 10 C.F.R. Part 100, App. A.

⁴³ Regulatory Guide 1.7, Revision 1 at 2.5-1, available at <http://pbadupws.nrc.gov/docs/ML1335/ML13350A352.pdf>.

⁴⁴ FSARU, Rev. 21 at 2.5-61, 2.5-66.

⁴⁵ It stated: “PG&E was requested by the NRC to evaluate the plant’s capability to withstand a postulated Richter Magnitude 7.5 earthquake centered along an offshore zone of geologic faulting, generally referred to as the ‘Hosgri fault.’ The detailed methods, results, and plant modifications performed based on this evaluation are dealt with in Section 3.7.” FSARU, Rev. 20 at 2.5-58.

⁴⁶ See FSARU, Rev. 20 at 2.5-57 to 2.5-59.

choose which earthquake provides the bounding scenario for seismic hazard.⁴⁷ By the Staff's October 12, 2012 letter and the subsequent June 23, 2014 Staff memo, the Staff directed and approved this change to the design basis. The Staff cannot approve such changes to the design basis without amending the license through a public notice and the opportunity for an adjudicatory hearing.⁴⁸

B. Changing the Maximum Earthquakes Identified for Diablo Canyon, as the Staff Has Directed, Alters the Terms of the Licenses and Grants Greater Operating Authority by Excusing PG&E from Demonstrating that the Licenses Meet the Terms of GDC 2

As acknowledged in the FSARU,⁴⁹ PG&E demonstrated that it met the GDC 2 design basis requirements with an SSE analysis based on the DDE spectrum. Nevertheless, each of PG&E's analyses of the new seismic information has treated the Hosgri or LTSP response spectra as the measure of whether the reanalyzed faults (Shoreline, Los Osos, and San Luis Bay) created unanalyzed risk. Based on this measure, PG&E asserts that the Shoreline fault should be treated as a lesser included scenario under the Hosgri evaluation. But this ignores the fact that the SSE scenario for Diablo Canyon remains the DDE (as Revision 21 states).⁵⁰ In order to satisfy GDC 2, the Shoreline evaluations⁵¹ must therefore be compared against the seismic qualification of critical SSCs calculated for the DDE scenario, not against the Hosgri. For the Staff to allow the licensee to use the Hosgri evaluation as the sole benchmark against which to measure new seismic risk, as Revision 21 does, alters the terms of the license and grants PG&E greater operating authority by eliminating some of the safety margin built into the licensing basis,

⁴⁷ See FSARU, Rev. 21 at 2.5-82 ("The determination of the appropriate earthquake parameters for design of the plant SSCs is addressed throughout Section 2.5, and the maximum earthquakes for the plant site are presented in Sections 2.5.3.9.1 [(DE/DDE)], 2.5.3.9.2 [(Hosgri)], and 2.5.3.9.3 [(LTSP)].").

⁴⁸ 42 U.S.C. § 2239(a)(1)(A); 10 C.F.R. § 50.91.

⁴⁹ FSARU, Rev. 21 at 3.2-1, 3.7-2, 3.7-39.

⁵⁰ See, e.g., FSARU, Rev. 21 at 3.2-1.

⁵¹ The FSARU change in Revision 21 designates only that the Shoreline Fault Zone is a lesser-included scenario under the Hosgri evaluation. Other information from reanalyzed faults, such as the San Luis Bay fault, must also be shown not to exceed the loads calculated for the DDE.

thereby *de facto* amending the licenses.

The Staff asserts that the Hosgri evaluation provides the “bounding” ground motion scenario. However, the Hosgri evaluation cannot provide the sole basis for seismic qualification of equipment at the plant under GDC 2, because the plant’s equipment was qualified for seismic-induced stress under the DDE analysis, not the Hosgri evaluation, based on different methods, assumptions, analytical inputs, load combinations, and acceptance criteria from those used in Hosgri evaluation.⁵² The DDE stress load predictions were based in part on analyses not performed for the Hosgri evaluation, such as:

- A coincidental accident or fire;
- Combined accident loads in ASME code calculations; and
- A 10 C.F.R. § 50.34 safety evaluation (FSARU Section 2.5 site description).⁵³

These differences resulted in more stress on certain SSCs in a DDE scenario than a Hosgri earthquake scenario, despite the greater shaking predicted for a Hosgri event.

One example is of the control rod drive mechanisms located at the top of the reactor, which are welded extensions of the reactor coolant pressure boundary. PG&E’s DDE/SSE (0.4g) analysis predicted about 80,000 pounds per inch of stress on the mechanisms, while PG&E’s Hosgri evaluation (0.75g) predicted only 40,000 pounds per inch of stress in the same location.⁵⁴

New section 2.5.8.1, “General Design Criterion 2, 1967 Performance Standards,” in Revision 21 asserts that the Hosgri evaluation establishes compliance with the GDC 2 design basis requirements for safe shutdown.⁵⁵ However, the Hosgri evaluation lacks critical inputs used

⁵² Letter from Dr. Michael Peck to Sen. Barbara Boxer, at 4 (Jan. 22, 2015) (attached as Exhibit 2).

⁵³ DPO Case File for DPO-2013-002, Document 5 – DPO Appeal Submission at 9 (ML14252A743).

⁵⁴ Exhibit 2, Letter from Dr. Michael Peck to Sen. Barbara Boxer, at 4 n.15.

⁵⁵ FSARU, Rev. 21 at 2.5-85.

for the DDE/SSE analysis, as described above.⁵⁶ The Staff’s assent to PG&E’s assertion that the Hosgri evaluation satisfies GDC 2 is therefore based on a less conservative test that enlarges PG&E operating authority. Thus the Staff’s approval of the Hosgri evaluation as a maximum earthquake *de facto* amends the licenses without the process required by the AEA.

C. NRC’s Approval of the Use of Different Methods for Calculating Ground Accelerations and Response Spectra from Those Used in the Design Basis Accomplishes a De Facto License Amendment

Revision 21 to the FSARU states that “the seismic qualification basis for Diablo Canyon will continue to be the original design basis plus the Hosgri evaluation, along with the associated analytical methods, initial conditions, etc.”⁵⁷ Accordingly, the methodologies used to calculate any new response spectra must be those in the licenses; changing them requires a license amendment.

Acting under NRC’s direction, PG&E has failed to qualify seismically critical SSCs for a Shoreline earthquake as required under the seismic design basis in its licenses. Instead, the Staff has allowed PG&E to develop new ground motion response spectra as the basis for concluding that a license amendment is not necessary in light of the new earthquake findings. But these spectra are derived with calculations that are different and less conservative than those approved for use in the licenses. Altering the formulas that determine how much of an earthquake’s energy will be delivered to the structure of the plant is a change in the methodology used to understand the risk to the public health and safety. Such a change of methodology triggers the obligation to amend the operating license.⁵⁸

Section 2.5.3.10 of Revision 21 (and section 2.5.2.10 of Revision 20) describes the

⁵⁶ See, e.g. FSARU, Rev. 21 at table 5.2-6.

⁵⁷ FSARU, Rev. 21 at 2.5-67 (emphasis supplied). The quoted language appeared in Revision 20, but was relocated and repeated in Revision 21.

⁵⁸ 10 C.F.R. 50.59(e)(2)(viii).

ground motion response spectra developed for the Hosgri evaluation, which produced a 0.75g estimation of ground motion at the plant likely to be produced from a magnitude 7.5 earthquake on the Hosgri fault. The FSARU includes free-field horizontal ground motion response spectra and vertical ground response spectra for the potential shaking at the plant.⁵⁹

Revision 21 described the development of a new GMRS to project the ground motion at Diablo Canyon resulting from an earthquake on the Shoreline fault, which is different from the GMRS described in the FSARU.⁶⁰ On the basis of this new spectrum, PG&E and the Staff claim that the ground motion estimated is “bounded” by that estimated in the Hosgri evaluation.

Changing the inputs makes it appear as though the seismic risk to the plant declines even as the number and severity of possible earthquakes increase due to the discovery of new faults and increased fault length. But the actual effect of manipulating the ground motion inputs is a decrease in the seismic safety margin of the plant. The ground motion potential reported in the CCCSIP Report and the March 2015 Report reevaluating seismic risk to the plant use these changed inputs, resulting in incorrect conclusions about the relationship of the risk to the design basis of the plant.

Allowing the licensee, in developing a response spectrum for the Shoreline fault, to use a different methodology from the methodology used to calculate the response spectrum used for comparison, enlarges the licensee’s operating authority and thus *de facto* amends the licenses. Since the Staff approved PG&E’s substitution of different methodologies to develop new response spectra from those methodologies used to develop the Hosgri evaluation spectrum, the Staff has altered the “methods of evaluation described in the FSAR (as updated) used in

⁵⁹ See, e.g., FSARU, Rev. 21 at Figure 2.5-34 and 2.5-35 (unchanged from Rev. 20).

⁶⁰ FSARU, Rev. 21 at 2.5-84 to 2.5-85.

establishing the design basis or in the safety analyses”⁶¹ and thus *de facto* amended the licenses.

The significance of the Staff’s willingness to allow PG&E free rein to substitute revised methods of analysis was described by Dr. Sam Blakeslee, a geophysicist and former California State Senator, in testimony presented to the United States Senate Committee on Environment and Public Works.⁶² Dr. Blakeslee stated that, “PG&E’s changes to its [ground motion prediction] methodologies have dramatically reduced estimated shaking at the plant from all hypothetical earthquakes.”⁶³ Dr. Blakeslee continued: “The predicted ground motion generated by [the faults surrounding Diablo Canyon as reanalyzed in the CCCSIP Report] are all greater than the current ground motion estimates for a M7.3 Hosgri Fault earthquake located 4.7 kilometers from the facility.”⁶⁴ His testimony explains how changing the assumptions and inputs of the ground motion prediction equations (GMPEs) will make it appear that longer, more capable faults produce less ground shaking than shorter, less capable faults. The new PG&E methodology, says Dr. Blakeslee, “essentially de-amplifies” the shaking estimated from any given earthquake related to the prior methodology used during the licensing process.⁶⁵

Dr. Blakeslee’s testimony provides an overview of the history of PG&E’s NRC-sanctioned modification of the GMPEs used to predict shaking at Diablo Canyon.⁶⁶ As Dr. Blakeslee testified, there are vast differences⁶⁷ between the GMPEs used to calculate the Hosgri spectrum in 1977 and GMPEs used to develop the spectra approved by the Staff for PG&E use in

⁶¹ 10 C.F.R. § 50.59(c)(2)(viii).

⁶² Testimony of Dr. Sam Blakeslee to U.S. Senate Committee on Environment and Public Works (Dec. 3, 2014) (attached as Exhibit 3). Dr. Blakeslee was also the author of California’s AB 1632, which required PG&E to conduct seismic hazard research of the faults near Diablo Canyon.

⁶³ *Id.* at 2.

⁶⁴ *Id.* at 5 (emphasis in original).

⁶⁵ *Id.* at 5.

⁶⁶ *Id.* at 9-13.

⁶⁷ For example, some of the de-amplification factors that Dr. Blakeslee points to are the reliance on a database of 3,600 recordings of ground motion, which occur in rock of a different type than the rock underlying Diablo Canyon and contain fewer than two dozen recordings within less than 2 km of the plant (where the San Luis Bay and Shoreline faults are located). *Id.* at Appendix.

the CCCSIP Report and the March 2015 Report⁶⁸—the reports PG&E and the Staff rely upon to conclude that the new seismic risk is bounded by the Hosgri evaluation spectrum. Dr. Blakeslee describes the net effect of the changed methodologies as reducing the peak ground acceleration from the Hosgri evaluation from 0.75 g to 0.46 g, even though the calculation producing 0.46 g assumes a joint rupture along 171 km of fault line (joint Hosgri-San Simeon rupture scenario) as compared with the 90 km in length assumed for the Hosgri fault in 1977.⁶⁹ With NRC’s approval, PG&E has relied on these new calculations to conclude that the Shoreline earthquake scenario is “bounded” by the Hosgri evaluation spectrum.

A change in the GMPEs that produces such a drastic revision of the projected risks to the plant in effect grants PG&E greater authority to operate by effectively reducing the safety margin required by the licenses. Such a change amounts to a *de facto* license amendment.

D. The Changes to Revision 21 of the FSARU Ordered by the Staff, Made by PG&E, and Approved by the Staff, De Facto Amend the Licenses

The Staff’s affirmative actions to approve the above-cited changes distinguish this case from *St. Lucie* and *Fort Calhoun*, in which the asserted *de facto* license amendment was achieved by the licensee’s actions alone.⁷⁰ Here, the Staff first directed PG&E to modify the FSARU to include the Shoreline scenario as a “lesser included case under the Hosgri evaluation.”⁷¹ Next, PG&E modified the FSARU accordingly, noting that the proposed changes had been “submitted to, and approved by, the NRC.”⁷² Relying on the Staff’s direction, PG&E determined that a license amendment request was not necessary in order to make the changes. Indeed, PG&E determined that it need not prepare even a section 50.59 “screen”—a preliminary

⁶⁸ Though Dr. Blakeslee’s testimony predates the March 2015 Report, that Report utilizes the revised GMPEs described in the September 2014 Report.

⁶⁹ *In re Pacific Gas & Electric Company* (Diablo Canyon Units 1 and 2), 13 N.R.C. 903, 922 (1981).

⁷⁰ See *supra*, section II.B.

⁷¹ NRC letter, Diablo Canyon Power Plant – NRC Review of Shoreline Fault, at 2 (Oct. 12, 2012) (ML120730106).

⁷² Exhibit 1, UFSAR Change Request at 102.

step to determining whether a license amendment request was necessary—because the changes to the FSARU were made at the Staff’s direction.⁷³ Finally, the Staff approved the substance of the changes and found that the changes were made in accordance with Commission regulations.⁷⁴

PG&E and the Staff maintain that the Staff does not “approve” updates to a FSARU and, therefore, an internal Staff memo finding that Revision 21 satisfies Commission regulatory requirements, cannot form the basis of a *de facto* license amendment claim.⁷⁵ But this argument is belied by PG&E’s request to change the FSARU, which explicitly noted that the changes proposed had already been “submitted to, and approved by, the NRC in docketed correspondence.”⁷⁶ This document indicates that the Staff approved the substance of the changes made to the FSARU, even assuming *arguendo* that the Staff did not approve the Update itself (which FoE maintains it did).⁷⁷ This language, along with the Staff’s directive to modify the FSARU and PG&E’s reliance on that directive, are sufficient to constitute Staff action granting the licensee additional authority. Thus, unlike in *Fort Calhoun* and *St. Lucie*, here the Staff has taken affirmative action under the Commission’s authority constituting amendments to Diablo Canyon’s licenses without the public hearing opportunity required by section 189a of the AEA.

III. Inspection Report 2014-008 De Facto Alters Terms of the Licenses

A. *The Staff Approved PG&E’s Determination that Diablo Canyon’s SSCs Remain Operable Following Discovery of Increased Seismic Risk in September 2014*

In September 2014, PG&E issued the CCCSIP Report, finding that seismic hazards surrounding the plant are much greater than shown by previous studies. To accompany the report, PG&E issued an Operability Determination, titled “Preliminary New Seismic

⁷³ *Id.*

⁷⁴ NRC, Memorandum from Peter J. Bamford to Michael T. Markley (June 23, 2014) (ML14022A120).

⁷⁵ *See id.*

⁷⁶ Exhibit 1, UFSAR Change Request at 102 (emphasis supplied).

⁷⁷ *See* NRC, Memorandum from Peter J. Bamford to Michael T. Markley (June 23, 2014) (ML14022A120).

Information,” concluding that the plant’s SSCs remained operable despite the new seismic information.⁷⁸

To determine the operability of the applicable SSCs, PG&E used two methods to develop two deterministic response spectra for several faults, including the Shoreline and Hosgri faults, and then compared these spectra with the 1977 Hosgri evaluation spectrum.⁷⁹ The spectrum resulting from the first method was bounded by the 1977 Hosgri evaluation spectrum.⁸⁰ But this method was based on only two earthquake recordings and therefore may not be adequate to ensure operability.⁸¹ PG&E then completed a second analysis using a different method, which resulted in a spectrum that exceeded the Hosgri spectrum.⁸² Thus, the second spectrum exceeded the spectrum previously held up as Diablo Canyon’s “bounding” spectrum (Hosgri spectrum).

PG&E arbitrarily chose to disregard the spectrum resulting from the second method, instead relying on the first spectrum. PG&E therefore concluded that the reevaluated seismic data was bounded by the Hosgri spectrum and, therefore, that the plant remained operable.⁸³

The Staff then issued Inspection Report 2014-008, approving PG&E’s determination of operability. As part of its review of the Operability Determination, the Staff evaluated and accepted the licensee’s assumptions, methodologies, and conclusions used in the CCCSIP Report, thereby allowing PG&E to continue to operate the plant based on analytical methods different from those in the FSARU (“the original design basis plus the 1977 Hosgri Evaluation,

⁷⁸ The PG&E Operability Determination appears to be non-public.

⁷⁹ Diablo Canyon Power Plant – NRC Focused Baseline Inspection Report 05000275/2014008 and 05000323/2014008, at 4 (Dec. 15, 2014) (ML14349A485) (“Inspection Report 2014-008”).

⁸⁰ *Id.* at 4.

⁸¹ *Id.* at 5.

⁸² *Id.* at 4; *see also* California Independent Peer Review Panel, Report No. 9, Comments on PG&E’s [CCCSIP] Report part 3, at 13, 15 (Mar. 6, 2015) (attached as Exhibit 4) (noting the Panel’s “concern regarding the adequacy of using only two earthquakes in estimating the site-specific term”).

⁸³ Inspection Report 2014-008 at 3.

along with the associated analytical methods, initial conditions, etc.”).⁸⁴

B. *The Staff's Inspection Report 2014-008 Granted PG&E Additional Authority Than Authorized by the Plant's Licenses*

The Staff's Inspection Report 2014-008 alters the terms of Diablo Canyon's licenses by (1) endorsing PG&E's deviation from previously approved analytical methods, and (2) excusing PG&E from complying with terms in its licenses requiring it to analyze the seismic hazard against the DDE (the plant's SSE) and the Hosgri evaluation. Even though one of PG&E's own analyses showed that the reevaluated spectrum exceeded the Hosgri spectrum, the Staff approved the licensee's operability finding. The Staff's approval of the licensee's Operability Determination, which allows the plant to continue operating, constitutes agency action that *de facto* amends the licenses.⁸⁵

CONCLUSION

For the foregoing reasons, the Staff has *de facto* amended the terms of Diablo Canyon's licenses without providing an opportunity for a public hearing as required by section 189a of the AEA. Because FoE has satisfied the criteria for standing, timeliness, and admissibility of contentions, the Board should grant FoE's Petition to Intervene and Request for Hearing.

Respectfully submitted,

/s/ signed electronically by

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Dated: June 19, 2015

⁸⁴ *Id.* at 4.

⁸⁵ FoE expects PG&E and the Staff to respond to this assertion, as they have in the past, by maintaining that Inspection Report 2014-008 was issued under the Staff's oversight duties and therefore cannot constitute a *de facto* license amendment. But as recognized *supra*, it is the effect and not the label of a Staff's action that is relevant to the inquiry of whether a *de facto* license amendment has occurred. *Citizens Awareness Network*, 59 F.3d at 293.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

<u>In the Matter of</u>)	Docket Nos. 50-275, 50-323
)	
PACIFIC GAS & ELECTRIC COMPANY)	ASLBP No. 15-941-05-LA-BD01
)	
<u>(Diablo Canyon Power Plant, Units 1 and 2)</u>)	June 19, 2015

CERTIFICATE OF SERVICE

I hereby certify in accord with 10 C.F.R. § 2.305 that copies of the foregoing “Petitioner Friends of the Earth’s Supplemental Brief” and accompanying exhibits have been served upon all registered counsel through the Electronic Information Exchange e-filing system this 19th day of June, 2015.

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