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**Draft IEPR's Discussion of Diablo Canyon and San Onofre**

*Additional submitted attachment is included below.*

**STATE OF CALIFORNIA  
ENERGY RESOURCES CONSERVATION  
AND DEVELOPMENT COMMISSION**

In the matter of )  
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Preparation of the ) Dockets No. 15-IEPR-01 and 15-IEPR-12  
*2015 Integrated Energy Policy Report* )  
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**ALLIANCE FOR NUCLEAR RESPONSIBILITY'S COMMENTS ON  
DRAFT 2015 INTEGRATED ENERGY POLICY REPORT**

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## COMMENTS

Pursuant to the October 19, 2015 docketed specification of the deadline for written comments, and as a follow-up to the verbal comments it made at the October 20, 2015 Lead Commissioner workshop, the Alliance for Nuclear Responsibility (“A4NR”) respectfully submits its written comments on the 2015 Draft Integrated Energy Policy Report (“IEPR”). These comments focus on ten important observations in the Draft IEPR Report which deserve fuller explanation.

- 1) **page 221: “... however, SCE plans to complete the full decommissioning process within 20 years. California further requires the decommissioned plant site be restored to its original condition; this requirement involves additional activities beyond what the NRC may require.”**

**A4NR Comment:** The 20-year estimate appears to focus on only a subset of the various decommissioning tasks, overlooking the immutable reality that decommissioning will only be complete when all of the Spent Nuclear Fuel (“SNF”) is removed, the site restored, and the license terminated. SCE’s current estimate is that this status will not be achieved until 2052 (37 years from now), but that optimism is premised on the federal government beginning to take delivery of SNF nationally in 2024 and removing all SNF from the SONGS site by 2049. The Decommissioning Cost Estimate that SCE filed with the CPUC openly acknowledges “this schedule is likely to be extended in future updates to the SONGS 2 and 3 decommissioning cost estimate.”<sup>1</sup> SCE estimates that a ten-year delay in its SNF removal schedule would increase its dry storage costs by \$149 million (2014 dollars), and that a 100-year delay would add \$1.49 billion (2014 dollars).<sup>2</sup>

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<sup>1</sup> A.14-12-007, Exhibit-01, p. 25, lns, 7 – 9.

<sup>2</sup> A.14-12-007, Transcript, SCE-Bledsoe, p. 281, ln. 24 – p. 283, ln. 26.

- 2) **page 222: “Pursuant to the site lease agreement between the U.S. Navy and SCE, the San Onofre site must be restored and remediated to the original condition of the land before the San Onofre plant was built.”**

**A4NR Comment:** Under the nearly five-decades-old agreement, the Navy can require SCE to remove all subsurface structures from the site and there is every indication that the Navy intends to do so. SCE calculates that past customer contributions to the decommissioning trusts have now fully funded the costs of such removal, but nevertheless is attempting to remove the requirement from a renegotiated agreement with the Navy. About 42% of the \$346 million cost of compliance is due to the requirement that all clean concrete and demolition debris be disposed of at an out-of-state Class III landfill pursuant to State of California Executive Order D-62-02.18.68.<sup>3</sup> The Final IEPR Report should condemn any notion of abandoning subsurface debris, ineligible even for deposit in a California landfill, on what may one day become a heavily visited public beach.

- 3) **page 228: “Several factors related to the plant in particular and the electricity market in general have come together to create a degree of uncertainty as to whether Diablo Canyon will continue to generate power in the long-term.”**

**A4NR Comment:** Framing this “uncertainty” as an issue in “the long-term” is a planning myopia which ignores the unanticipated abruptness in the demise of each of California’s other nuclear reactors. The Draft Report does an admirable job of explaining why the sudden disappearance of Diablo Canyon from the CAISO supply stack would be inconsequential compared to the SONGS 2&3 closures. But there is nothing in the Humboldt Bay, Rancho Seco, SONGS 1, or SONGS 2&3 shutdowns that suggests Diablo Canyon’s eventual retirement will be a

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<sup>3</sup> A.14-12-007, Exhibit-20, p. 6, Ins. 14 – 16.

product of “long-term” discretionary choices. A4NR does not dispute the preferability of a more orderly approach, and California’s evolving contemplation of flexible capacity needs may illuminate a path forward. As the CAISO staff’s recent presentation of flexible resource adequacy criteria described: “Question to date: How much flexible capacity is needed? The paradigm is shifting. It is time to change the question: Is there a need to limit the quantity of inflexible capacity?”<sup>4</sup> (emphasis in original)

**4) pages 230 – 231: “According to PG&E, the new research confirms that Diablo Canyon is designed to withstand a major earthquake on any of the faults surrounding Diablo Canyon.”**

**A4NR Comment:** This statement is materially misleading without explaining that PG&E, without informing the IPRP, consciously omitted from the CCCSIP report the joint rupture analyses it had been planning to include as late as December 2013. These were deterministic assessments linking the Hosgri to faults running up to the Mendocino Triple Junction offshore Northern California, and then separately linking the Hosgri to the Los Osos, to the San Luis Bay, and to the Shoreline faults. PG&E assigned a M8 to each joint rupture, and also evaluated a M8.4 in a Hosgri-Mendocino scenario with an assumed annual recurrence rate of  $10^{-6}$ . The ramifications of excluding these large magnitude analyses is apparent from the short shrift which IPRP Report No. 9 made of the one joint rupture “sensitivity” which PG&E chose to include in CCCSIP, a M7.3 joint rupture of the Hosgri (extended only to San Simeon) and the Shoreline faults: PG&E’s sanguine conclusion is driven by its data-sparse ground motion methodology. As shown in Figure 6 of IPRP Report No. 9, when the conventional ergodic

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<sup>4</sup> “Flexible Resource Adequacy Criteria and Must-Offer Obligation – Phase 2,” August 18, 2015, p. 10. Accessible at <http://www.caiso.com/Documents/PresentationProposal-FlexibleRACriteriaMustOfferObligation.pdf>

methodology is applied, the M7.3 “sensitivity” exceeds the 1977 Hosgri and 1991 LTSP spectra as well as the plant’s licensed design basis.<sup>5</sup> The exceedances would likely be even greater in the missing joint rupture cases.

The 2015 IEPR should also squarely confront PG&E’s multi-year refusal to produce a “deterministic”<sup>6</sup> assessment of a San Simeon-type blind thrust earthquake “directly beneath the plant,”<sup>7</sup> as originally recommended in the Energy Commission’s 2008 AB 1632 Report. PG&E’s various responses over the years have never explained why these specific directions in the AB 1632 Report are consistently ignored in the evasive substitutes it has put forward.

**5) page 231: “But the IPRP did not support the CCCSIP’s interpretations of the modeled faults in the Irish Hills, finding the interpretations to be inconsistent.”**

**A4NR Comment:** This statement tells only part of the story. In response to the IPRP criticisms, PG&E agreed that the forthcoming SSHAC Report would equally weight each of the three competing tectonic models of the Irish Hills. As PG&E’s Geosciences Department explained to the company’s Chief Nuclear Officer, “There is no preferred model based on available data.”<sup>8</sup> But when the SSHAC Report was published, the weighting was inexplicably 40-40-20, with PG&E having under-weighted the model showing the greatest impact on seismic hazard. No slave to consistency, PG&E has recently insisted that there is in fact a preferred model<sup>9</sup> but has made no move to alter the SSHAC Report or confer with the IPRP on this new assertion.

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<sup>5</sup> IPRP Report No. 9, pp. 12, 14, Figure 6.

<sup>6</sup> CEC, An Assessment of California’s Nuclear Power Plants: AB 1632 Report, November 2008, p. 7, footnote 6.

<sup>7</sup> *Id.*, p. 5.

<sup>8</sup> A.15-02-023, A4NR-1, p. 37.

<sup>9</sup> A.15-02-023, PG&E Opening Brief, p. 23.

- 6) **page 232: “Yet, the IPRP had criticized the Shoreline Fault study for using only two earthquakes (the San Simeon and Parkfield earthquakes) to characterize site amplification ...”**

**A4NR Comment:** PG&E’s data dependence on only two not-quite-local earthquakes (San Simeon, 35 km away, and Parkfield, 85 km away<sup>10</sup>) drew criticism in 2012 from the NRC,<sup>11</sup> even before the IPRP’s Report No. 6 in 2013. A 2014 PG&E “*Calculation Document*” -- never discussed or shared with the IPRP – indicates that a more accurate count of the earthquakes PG&E relied upon would be “1 + a synthesized proxy.” Of the two free-field recording sites at Diablo Canyon, ESTA27 (with two profiles) and ESTA28 (with one profile), only ESTA27 was installed at the time of both earthquakes. Consequently, there was no San Simeon data actually recorded at ESTA28. Despite ESTA27’s longer history and the availability of two profiles rather than one, PG&E selected ESTA28 as the reference free-field station for analytic purposes -- ostensibly because “(t)he deeper part of the velocity profile at Station ESTA28 is more consistent with deeper parts of the velocity profile for the power block and turbine building than station ESTA27.” Consequently, in order to simulate San Simeon data for ESTA 28, an “amplification factor” had to be applied to data actually recorded at ESTA27.<sup>12</sup>

As Dr. Sam Blakeslee, the former Exxon research geophysicist and legislative author of AB 1632 (2006), recently testified to the CPUC:

... in the very range where the data is least available, and where Diablo is most vulnerable, the functional form of the models results in shaking predictions that minimize the effect of increasing proximity and earthquake magnitude. The importance of this assumption, which is built into the model predictions, is difficult to overstate. Are

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<sup>10</sup> PG&E has previously acknowledged the Shoreline Fault is 0.6 km from the Diablo Canyon power block and 0.3 km from the intake structures, while the CCCSIP Report places the San Luis Bay Fault 1.9 km, the Hosgri Fault 4.7 km, and the Los Osos Fault 8.1 km away from the power block.

<sup>11</sup> The NRC’s assessment of PG&E’s single-station-sigma adjustment at Diablo Canyon: “*Generally a larger number of earthquakes would be needed to develop confidence in the correction factor.*” RIL 12-01, p. 59.

<sup>12</sup> A.15-02-023, A4NR-1, p. 25.



these good assumptions? It is impossible to know given the paucity of strong motion data in the ranges and magnitudes relevant to Diablo.<sup>13</sup>

- 7) **page 231: “As shown in Figure 58 below, of the different types of seismic hazard categories to understand for Diablo Canyon, site amplification remains one of the most uncertain, in the view of the IPRP.”**

**A4NR Comment:** Some contextual explanation is necessary to fully appreciate the significance of Figure 58. Its graphic ranking of seismic hazard categories is a direct reproduction of the chart PG&E handed out at the IPRP’s January 8, 2015 public meeting. This was four months after submittal of the “final” CCCSIP Report to the NRC without review by the IPRP. After the most expensive seismic re-evaluation of a nuclear plant site in North American history (\$64.25 million in ratepayer funds authorized by the CPUC), how is it possible that the six top-ranked contributors to hazard uncertainty were never addressed by PG&E or even discussed with the IPRP? As Figure 58 makes visually indisputable, none of the CCCSIP subjects begins to approach the significance of what was neglected. Since this major deficiency was communicated in a widely circulated January 14, 2015 letter from A4NR to Chair Weisenmiller and CPUC President Picker,<sup>14</sup> the 2015 IEPR would be remiss if it avoided discussion of the necessity of completion (or the inadequacy of PG&E’s 2025 timetable for doing so).

- 8) **page 233: “However, the graph also shows that results of the 2015 PSHA analysis are above the double design earthquake standard, which is the original design basis for the plant.”**

**A4NR Comment:** While Figure 59 graphically documents the design basis issue that A4NR brought to the CEC’s attention in the 2013 IEPR process, it should be supplemented by the even more troubling graphs included in IPRP Report No. 9 (Figures 5 and 6) showing large

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<sup>13</sup> A.15-02-023, A4NR-2, p. 13.

<sup>14</sup> Accessible at <https://docs.google.com/file/d/0BxF9Aruagb7mZGNpenF4S3N6aUE/edit?pli=1>

exceedances of the 1977 Hosgri and 1991 LTSP spectra when PG&E's data-sparse ground modeling is replaced by the conventional ergodic methodology. The 2015 IEPR should properly utilize the factual context which the state agencies represented on the IPRP have established.

- 9) **page 235: "This four-to-one ratio is the lower limit constraint that is in compliance with NRC's regulations for spent fuel stored in pools. PG&E plans to complete the construction of eight dry casks in 2015 and 12 casks in 2016, allowing PG&E to approach this ratio."**

**A4NR Comment:** This statement inaccurately conflates the technical specifications in PG&E's current license – which are eminently changeable – with the less malleable NRC "regulations" applied to all plants. The NRC determined in 2013 that the benefits of expedited SNF transfer were insufficient to justify generic regulations applied to all plants, based on NRC cost/benefit standards for fleet-wide mandatory backfits. The analysis was based on a seismic assessment of plant sites in the central and eastern U.S. utilizing a 2008 model from the U.S. Geological Survey ("USGS"), and contained the explicit disclaimer: "Although the USGS model considers sites in the western United States (including Columbia, Diablo Canyon, Palo Verde, and San Onofre), the staff has not performed the necessary analyses for these sites to include them in this analysis."<sup>15</sup> The NRC indicated that western sites will be considered on a site-specific basis after conclusion of the 10 CFR 50.54(f) seismic reviews,<sup>16</sup> now scheduled for late 2017 at Diablo Canyon. Depending upon the discount rate used, the NRC's generic assessment placed the cost of a low-density storage scenario at \$51.4 – 53.8 million for each of two pools,<sup>17</sup> but did not disaggregate these costs between fabrication/loading of additional casks and

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<sup>15</sup> "Staff Evaluation and Recommendation for Japan Lessons-Learned Tier 3 Issue on Expedited Transfer of Spent Fuel," COMSECY-13-0030, November 12, 2013, p. v.

<sup>16</sup> *Id.*, p. 80.

<sup>17</sup> *Id.*, p. 41.

construction of sufficient ISFSI capacity. Full build-out of the ISFSI is already a sunk cost at Diablo Canyon.

Significantly, the NRC's 2013 generic analysis – published two years prior to the PG&E General Rate Case filing referenced in the Draft 2015 IEPR – defined “low-density” much more rigorously than PG&E has (i.e., 312 assemblies per pool vs. 772):

The NRC assumes the reactor core contains 193 assemblies and the SFP has a capacity of approximately 1,220 assemblies in a high-density 1X4 loading configuration. This number is based on a pool capacity of 1,414 assemblies, reduced by 193 assemblies to accommodate a full core offload capability using the existing high-density racking. **In a low-density 1X4 with empties configuration, the SFP stores 312 assemblies.** The unit operates on 18-month cycles, discharging approximately 78-84 assemblies per cycle.<sup>18</sup> (emphasis added)

The 2015 IEPR should apply this NRC baseline for “low-density” in evaluating whether PG&E's proclaimed commitment to SNF transfer to dry casks “as soon as operationally achievable”<sup>19</sup> is sufficient. The Energy Commission's original recommendation on this subject was in the 2008 AB 1632 Report, compliance with which is specifically required by Ordering Paragraph 29(b) of CPUC Decision 14-08-032.

**10) page 236: “The Energy Commission offered comments and recommendations as part of a subcommittee of the Review Committee for Nuclear Fueled Power Plants.”**

**A4NR Comment:** The discussion following this statement skips over the first (and most significant) sentence of the subcommittee's conclusions: “The Subcommittee finds that there is no basis for an exemption for Diablo Canyon from the OTC Policy.”<sup>20</sup> Eschewing direct recognition of such a statement from the staffs of both the CEC and the CPUC is redolent of

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<sup>18</sup> *Id.*, p. 72.

<sup>19</sup> A.15-09-001, PG&E-5, WP 3-291.

<sup>20</sup> Subcommittee Comments on Bechtel's Assessment of Alternatives to Once-Through-Cooling for Diablo Canyon Power Plant, November 18, 2014, p. 12.

King Belshazzar's earlier, unsuccessful attempt at similar avoidance as he stared at that wall in  
Babylon.

Respectfully submitted,

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