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Diablo comment

Additional submitted attachment is included below.

Docket #: 21-ESR-01 Project Title: Energy System Reliability

COMMENTS BY DANIEL HIRSCH[1] ON CALIFORNIA ENERGY COMMISSION UPCOMING REPORT TO SUPPORT PROPOSED BREACH OF DIABLO CANYON NUCLEAR PLANT PHASE-OUT AGREEMENT

Abstract

The California Energy Commission (CEC) is rushing to prepare a report, planned to be released in draft in the next couple of weeks and in final form shortly thereafter,[2] that may do more harm to the health and safety of the people of California and the state's crucial climate goals, as well as reputational damage to the CEC itself, than any other action taken in its history. The prior report[3] was heavily criticized because it appeared to have been directed to reach a pre-ordained desired conclusion supporting continued operation of the Diablo Canyon Power Plant, and then worked backwards from that point to justify that outcome. The first report would not withstand academic scrutiny. The presentation made to date about plans for the new report suggest that same kind of "reverse engineering" is at work–the CEC seems to have marching orders to justify breaching the Diablo phase-out agreement, and is massaging inputs for its new analysis to reach that conclusion.

Background

Inside each Diablo Canyon reactor, when operating, resides 15 billion curies of radioactivity. Each curie gives off 37 billion radioactive emissions per second. We measure permissible concentrations in the environment in pico-curies, millionths of a millionth of a curie. Put differently, each reactor contains a thousand times the long-lived radioactivity of the Hiroshima bomb, and the irradiated fuel storage about ten times more.

That radioactivity only stays inside the fuel if it is constantly cooled. An event that disrupts the cooling–for example via an earthquake, failure of an aged part that hasn't been maintained appropriately, or terrorist attack–can cause the fuel to melt, massive amounts of radioactivity to be released, and potentially a significant part of California to be contaminated. The longer Diablo operates, the higher the probability of an accident.

Diablo was designed and constructed based on PG&E's assertion that there were no active earthquake faults within 30 kilometers.[4] After construction was largely completed, PG&E

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[1] Daniel Hirsch is the retired Director of the Program on Environmental and Nuclear Policy at the University of California, Santa Cruz, and President of the Committee to Bridge the Gap, an energy and environmental NGO.

[2] The video recording of the CEC's July 7, 2023 Diablo Canyon workshop indicates at minute 37:51 that although the final report is required by the legislator by September 30th, the CEC is working to get a draft circulated by early August and the final completed by late August.

[3] California Energy Commission Report: Diablo Canyon Power Plant Extension Final Draft, March 2023

[4] For more detail on the seismic history, see the testimony of Daniel Hirsch before the U.S. Senate Environment and Public Works Committee, December 3, 2014 . See also the testimony of Sam Blakeslee before the same Senate Committee. Both are included herein by reference.

conceded the existence of the nearby Hosgri Fault, capable of a far larger quake than the plant was designed to withstand. PG&E requested an exemption from its license requirements to allow the plant to go forward nonetheless. Minimal earthquake upgrades were done to the plant, but it was then discovered that the wrong blueprints had been used (Unit 1 and Unit 2 were built to mirror-image blueprints) and the pipe snubbers and whip restraints had been put in the wrong places.

PG&E asserted no other faults were present, but then the San Luis and Los Osos Faults were discovered nearby, and thereafter the Shoreline, which comes within 600 meters of the plant, all capable of larger events than the plant was designed for. PG&E claimed the faults weren't connected, and then had to concede they were (longer faults are capable of larger earthquakes). The Nuclear Regulatory Commission's Senior Resident Inspector for Diablo, Dr. Michael Peck, found the plant to be operating in violation of its license because of these newly discovered faults. The NRC, however, overruled him, and he courageously filed a Differing Professional Opinion. The 2016 agreement to end Diablo's operation at the conclusion of its current license period (2024 for Unit 1, 2025 for Unit 2) was, to a large degree, entered into because of these troubling seismic findings – a compromise that PG&E would shut the plant down in exchange for not having to upgrade the plant.

Further operation of the reactors would also produce vast quantities of high level radioactive waste, dangerous for half a million years, potentially impacting ten thousand generations, for which there remains no permanent disposal facility. And continued operation of Diablo would result in enough plutonium produced each additional year for a hundred nuclear bombs. Because plutonium has a 24,000 year half-life, that proliferation risk would extend for immense periods of time.

Additionally, the Diablo phase-out agreement was entered into because continued operation of Diablo would interfere with meeting California's renewable energy goals. Diablo is inflexible–it cannot do load-following. It is either on fully or off fully. Therefore, if not phased out as promised, solar and wind have to be turned off frequently because overall supply would exceed demand. PG&E acknowledged this as a factor in entering into the 2016 Agreement:

> After considering factors including, but not limited to, (i) the increase of the Renewable Portfolio Standard ("RPS") to 50% by 2030; (ii) doubling of energy efficiency goals under SB 350; (iii) the challenge of managing overgeneration and intermittency conditions under a resource portfolio increasingly influenced by solar and wind production; (iv) the growth rate of distributed energy resources; and (v) the potential increases in the departure of PG&E's retail load customers to Community Choice Aggregation ("CCA"), PG&E in consultation with the Parties has concluded that **the most effective and efficient path forward for achieving California's SB 350 policy goal for deep reductions of GHG emissions is to retire Diablo Canyon at the close of its current operating license period and replace it with a portfolio of GHG free resources.**

(emphasis added)

Finally, because nuclear power is not cost-competitive with increasingly cheaper renewables (solar, wind, and hydro) and storage, every dollar wasted on nuclear power is taken from genuine solutions to the climate crisis.

A Bill on Beer-Making Was Gutted, Amended, and Voted on at End of Session

The 2016 Agreement was entered into by PG&E, four environmental groups, and two labor organizations, and subsequently approved by the CPUC and then the State Legislature. Nonetheless, on Sunday night, August 28 of last year, the Governor arranged for a "gut and amend" of SB 846. SB 846, a bill dealing with alcoholic beverage licensing, had gone through almost the entire legislative process. A mere three days before close of session, the Governor stripped SB 846 of its alcoholic contents and inserted instead language to keep Diablo Canyon operating for years beyond its agreed-on closure date.

In so doing, the normal deliberative legislative process was bypassed. Normally, bills are introduced at the beginning of the year, are subject to extensive hearings in the policy and appropriations committee of the house of origin, debated on the floor of the originating chamber after opportunity for detailed analysis and letters of support or opposition from organizations and the citizenry, and then the process is repeated in the other chamber. Instead, that process was followed for much of a year on a bill regarding alcohol, and then three days before the close of session, it became a bill on keeping two dangerous nuclear reactors operating for years longer than planned–or safe.

There were two hearings before legislative committees, the Utilities Committees of the Assembly and Senate, but they occurred *before* the new nuclear language had been inserted into the bill, so there could be no serious consideration of a proposal not yet even published. And then, the bill was not voted on by either chamber until 1 a.m. on September 1, in the very last minutes of session.

It was widely reported that Members of the Legislature were deeply troubled by both the substance and the process but were pressured into voting for the bill because of threats by the Governor to veto Members' important legislation if they did not acquiesce on SB 846. A proposal that can withstand scrutiny does not need to bypass the very scrutiny longstanding governmental processes are designed to provide.

The CEC Conduct Follows the Same Disturbing Pattern

It should not need to be pointed out that the staff of the CEC work for the Commissioners, and the Commissioners have all been appointed or reappointed by Governor Newsom. Given the Governor's conduct in bypassing normal legislative review for the Diablo legislation, and the financial ties between the Governor and PG&E,

a cloud hangs over the CEC's subsequent conduct of the Diablo review. The CEC's actions to date raise serious credibility concerns.

One notes that the pattern of hiding-the-ball seen in the gut-and-amend legislation seems to be being repeated by the CEC in its role. Comments on what CEC vaguely says it is considering for the second report are due only a couple weeks before the expected release of the draft report, which in turn will be released only a couple of weeks before it is finalized. This raises questions whether review and meaningful input are intended.

The March CEC Report[5]

The CEC's first report, in March of this year, would not survive scrutiny in any serious scholarly setting. It seems clearly written to produce the answer the Governor wanted, to assert continued operation of Diablo beyond the agreed-to closure date was necessary for reliability. The outcome predetermined, fairly absurd assumptions were piled on, one after the other, to reach the desired conclusion. The profession's standard assumptions were thrown out or ignored. It gives the clear impression of having been back-calculated: if we need to reach a conclusion that Diablo is needed for reliability, what unlikely scenarios do we need to throw in to get there?

The report concedes that "The analysis shows that under the current resource adequacy planning standard, the CPUC's procurement orders, Decision (D) 19-11-016 and D.21-06-035, are sufficient to eliminate shortfalls through 2030." The current, and longstanding, planning standard, the report says, is a 1-in-10 standard: the probability of a shortfall in electricity being 1 day in 10 years.

Then the report goes ahead and violates that very standard, insisting on keeping Diablo open because the 2022 event (which did not result in outages) was a 1-in-14 event, which does not exceed the 1-in-10 standard.[6] This is a matter of moving the goalposts.

The report then superimposes the 2022 event (which is within the accepted standard) on top of a presumed fire that would occur at the same time and take out an additional 4000 MW. No estimate is given of the probability that these two events would occur simultaneously, but it is obviously much smaller than the 1-in-10 standard.

Furthermore, the report assumes the loss of 3,700 MW from once-through cooling plants other than Diablo, even though the report admits that the Water Board had passed a draft measure extending the operations. The report simply ignores the Water Board action in its calculation.

[5] The report has a March date on the title page, but it was approved by the Commissioners on Feb. 28.
[6] The report admits it was a 1-in-27 event, but then changes the method of calculation to be based on 20 rather than 30 years, resulting in a presumed 1-in-14 event, still within the 1-in-10 standard.

Similarly, the report (p. 25) admits that in 2023 the CPUC issued an additional procurement order, for 4000 more megawatts, but then the report leaves that amount out of the calculation.

It becomes very hard to avoid the conclusion that CEC staff put a very heavy thumb on the scale to produce a result desired by the Governor, piling on one low-probability event on top of another, even when the probabilities are far lower than the 1-in-10 standard, while keeping admitted resources out of the equation. The report would not pass review in an academic setting.

The Upcoming 2nd CEC Report

The handful of slides presented by staff at the July 7 workshop about the follow-on report contain very little information, but what little is provided is unsettling. Slides 6 and 16 describe Diablo Canyon as "clean energy," ignoring the high level radioactive waste produced, the trail of contamination at uranium mining and milling operations, the risk of radioactive releases in accidents etc. Slides 15 and 16 indicate Diablo is "zero-carbon," which also is not true; mining, milling, and enrichment activities all result in significant carbon emissions.

But what is most troubling about the little presented about the upcoming report is how heavily skewed it is. Slide 16 indicates CEC will only consider alternatives that can be deployed by 2025, despite SB 846 direction [§25233.2. (a)]: "By September 30, 2023, the commission shall present a cost comparison of whether extended operations at the Diablo Canyon powerplant compared to a portfolio of other feasible resources available for calendar years 2024 to 2035, inclusive, is consistent with the greenhouse gases emissions reduction goals of Section 454.53 of the Public Utilities Code." (emphasis added)

The staff presentation seems to prohibit consideration of one of the seemingly most sensible approaches to dealing with the purported concern of an extreme event where for a few hours demand exceeds supply: keeping one or more gas plants in reserve solely for the purpose of providing a few hours of extra electricity in case of such an emergency. Gas plants, unlike Diablo, can ramp up quickly and do load-following.

The staff slides (see 18 and 19) appear to block or heavily oppose consideration of putting the money that would be needed to extend Diablo instead into more renewables and storage. This seems incomprehensible–that is exactly the issue at hand, that dumping more money down the rats' hole of those reactors steals resources that could go towards more solar, wind, batteries, etc.

Additionally, the staff seem to exclude consideration of pumped hydro storage, such as Helms Hydro. This is deeply perplexing. Perhaps this is due to lack of knowledge by CEC staff; in our meeting May 19 with the CEC staffer who was supposedly the most

knowledgeable about pumped hydro, he admitted he knew very little about it and specifically about Helms.

Diablo Canyon, because it can't do load-following, produces as much energy at 3 in the morning as at 3 in the afternoon. It thus uses Helms Hydro Pumped Storage at times to pump water up from a lower reservoir to an upper reservoir and release the water when needed to generate extra electricity. Were Diablo to close as promised, Helms Hydro would be freed up for storage by renewables.

Additionally, although Helms has a 1212 MW capacity, it is our understanding it is underused because of limits on capacity of the transmission line. That could be readily addressed, by increasing the capacity of the lines, a matter that would not require new rights of way or transmission towers.

Freeing up Helms Hydro storage for renewables, by Diablo shutting down as promised, and optimizing its capabilities for providing extra power to the system during those few hours of supposed special concern during rare events, is an alternative that should be considered.

Conclusion

The CEC faces a major test: will it do a credible and defensible analysis? If so, it would indicate that the system meets the longstanding reliability standard. It wouldn't try to ignore its own standard and heap low probability event on low probability event to get a desired outcome.

And to the extent low probability events of a few hours of rolling blackouts are of concern–and they should be, within limits–one must weigh them against the risk of an earthquake, a terrorist event, or failure of an embrittled reactor vessel resulting in a massive radioactivity release should Diablo Canyon be allowed to keep running. And one must consider how reversing the Diablo closure decision would be a dagger at the heart of our climate goal–clogging power lines so that renewables have to shut down, stealing money from investing in more renewables, blocking offshore wind development in San Luis Obispo because no one would consider building them if Diablo goes forward with a 20-year license renewal request and the transmission lines planned to be freed up for offshore wind are not going to be available for the new wind projects.

We all understand that there is a conflict between what one's conscience requires and orders from above. We all also understand the consequences of violating one's conscience in a way that could be devastating for large numbers of people.