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Subject: Re: Some Of The Many Reasons Why It's So Important To Close Diablo Down As Soon As Possible

Reply-To: Harvey Sherback <harveysherback@yahoo.com>

California Energy Commission
CEC Members
Robert B. Weisenmiller, Ph.D.
Chairman

July 15, 2016

Hello Chairman Weisenmiller, California Energy Commission Members & Staff,

Thanks for creating a better, safer world for us all. I just sent the letter below to President Michael Picker and the CPUC Commissioners. Thanks once again.

Harvey Sherback
Berkeley, California

California Public Utilities Commission
CPUC Commissioners
Michael Picker
President

July 15th, 2016

Hello President Picker, California Public Utilities Commission Members & Staff,

The Diablo Canyon nuclear power plant (DCNPP) is vulnerable and dangerous from within and without as well as from above and below. The environmental disasters that can be caused by Diablo are truly devastating. In this letter I list some of the many reasons why it's imperative that we close the DCNPP down as soon as possible.

The Danger From Within:

The Diablo Canyon nuclear generating station has two aging Westinghouse-designed 4-loop pressurized-water nuclear reactors that went online over 30 years ago. As nuclear plants age, neutron impingement hardens and embrittles these reactors. This loss of flexibility makes the plant's containment vessels susceptible to sudden shocks and aftershocks.

On May 4th, 2016 at the National Earthquake Conference in Long Beach a leading scientist, Dr. Tom H. Jordan, Chairman of the Southern California Earthquake Center, revealed that Southern California's section of the San Andreas Fault is "locked, loaded and ready to roll". The San Andreas Fault is one of California's most dangerous and longest fault systems. At the Conference, Dr. Jordan warned that the springs on the San Andreas Fault have been wound very, very tight. "It's been quiet since 1857 — too quiet". The idea that nuclear power plants are durable enough to withstand strong quakes like "The Big One" a mega-thrust magnitude 9 earthquake is a total myth.

Another of the many problems associated with the aging DCNPP is that critical parts like the feed-water pumps keep failing but are impossible to replace because of their location. It is no longer rational for us to live with the risks posed by the Diablo Canyon nuclear power plant. We need to adopt a new reality and begin the removal of this more than dangerous eyesore from our coastline.

The Danger From Without:

We now live in a world where much of our infrastructure is controlled by artificial intelligence (AI). Everything from traffic lights to our electric grid is run by these AI systems. The problem is that with the introduction of the worldwide web these systems can be breached by unscrupulous saboteurs who can be located anywhere on the planet. The truth is that we are under constant "Cyber Attack" by hackers both domestic and foreign. Last December, several Ukrainian power companies experienced a cyber-attack that resulted in unscheduled power outages that lasted up to six hours and impacted over 200,000 customers. Welcome to the world of Cyberwarfare.

On March 7, 2016, the Department of Homeland Security's Assistant Secretary Dr. Andy Ozment and Deputy Assistant Secretary Brigadier General Gregory J. Touhill wrote...."U.S. critical infrastructure entities have been affected by targeted intrusions in recent years, and it is imperative that critical infrastructure owners and operators across all sectors are aware and up-to-date on the cyber threat landscape and the measures they can take to protect their assets."

There is a real possibility that California's electric grid can be brought down by sophisticated cyber attacks at any time over the next nine years. Because the DCNPP is grid powered, these malicious digital assaults could trigger a devastating nuclear meltdown. Better safe than sorry, let's close Diablo down while we're still in control.

The Danger From Above:

The effects of a Electromagnetic Pulse (EMP) or geomagnetic storms created by Coronal Mass Ejections (CME) from the sun could also cause a catastrophic meltdown at the Diablo Canyon nuclear power plant. I believe that an EMP attack from a rogue nation or terrorist organization is perhaps one of the most serious security threats that our nation faces today.

Unfortunately, nuclear plants are tied to and dependent upon the electric grid to function. Without electricity the operator loses instrumentation and control power leading to an

inability to cool the reactor core. There's the very real possibility of a "Station Blackout," where all off-site power is lost. Every nuclear power plant has emergency diesel generators just for this purpose, assuming that the generators will start after an electromagnetic pulse. In the event of a station blackout, core damage is estimated to begin in approximately one hour if the auxiliary feedwater system and high pressure injection flow isn't restored in time. A CME or an EMP attack could cause the grid to go down and not come back up for months or years.

The loss of off-site power could also cause a failure of the spent-fuel-rod cooling systems. When the spent fuel cooling pumps stop working, the water in the pools start to boil off. Once Diablo's overcrowded spent fuel assemblies become uncovered, the fuel rods' cladding will start to melt. As bits of the melting fuel fall into what's left of the water, the water will flash to steam causing the pressure in the buildings to increase. Radioactive particles carried in the steam would then begin to exit the buildings through non-sealed portals and doors.

Exposing hot zirconium fuel rod cladding to the air causes an exothermic reaction and the cladding will actually catch fire at about 1,000 degrees centigrade causing toxic radioactive isotopes to be released into the atmosphere. Even the Nuclear Regulatory Commission (NRC) concedes that this type of fire cannot be extinguished. Why must we continue to live with this unnecessary danger?

Danger From Below:

Sadly, the entire California coastline lies along the Pacific Ring of Fire earthquake zone which has become much more active in recent years. As the earth's polar caps and glaciers melt at an ever-accelerating rate (2015 was the hottest year on record), the reduced weight on both the top and bottom of our planet is causing the earth's tectonic plates to shift. This increased movement is responsible for larger and more frequent earthquakes. Scientists assure us that it is only a matter of time before California experiences The Big One, a horrific natural geological disaster.

When Diablo was built some 30 years ago PG&E stated the there were no fault lines within thirty miles of the nuclear facility. The truth is that the plant sits on and is surrounded by a maze of faults. In his July 26, 2011 California Energy Commission's Integrated Energy Policy Report, Geologist Douglas H. Hamilton, Ph.D. stated that there are "two dangerous faults" that run directly underneath the Diablo Canyon nuclear power plant. The San Luis Range Thrust and the Diablo Cove Fault.

The San Luis Range Thrust:

The San Luis Range Thrust as thus defined, underlies the DCNPP at a depth as shallow as one km and is clearly seismically active. It has dimensions that suggest a deterministic earthquake generation capability in the range of magnitude $6.75 > M7.0$.

The Diablo Cove Fault:

The potential for future renewed surface movement along the Diablo Cove Fault in the

foundation beneath the Unit 1 turbine-generator power block, the Unit 1 reactor and probably the Unit 1 spent fuel-rod pool should be considered as part of any reevaluation of seismic margins at the Diablo Canyon nuclear power station.

The Diablo Cove Fault runs east to west and cuts across the seismically active Shoreline Fault. The Shoreline Fault is connected to the feared Hosgri Fault, a component of the San Andreas Fault System.

According to PG&E, the DCNPP can withstand earthquakes up to a magnitude of 7.5 and these faults don't pose significant threats to Diablo's integrity, but a USGS seismologist, Jeanne L. Hardebeck, believes that a joint seismic event of the Hosgri and Shoreline faults could exceed the plant's design capacity for safe operation, possibly reaching a magnitude 7.7.

In addition to these major faults there are undiscovered collaterals. Collaterals are faults that branch off of major fault lines. Because this location is so tectonically active, and the system of faults is so complex, no one can predict safety with confidence. The Diablo Cove Fault, the Shoreline Fault, the Hosgri Fault and the San Andreas Fault are all seismically linked, and the power stored within the combined network of fault systems could create an earthquake sufficient to exceed Diablo Canyon's safeguards.

Diablo's Spent Fuel Pool Water Storage Reservoirs, Seiche Hazard

Dr. Hamilton also stated in his July 26, 2011 "California Energy Commission's Integrated Energy Policy Report" that Diablo Canyon's two broad, relatively shallow 2.5 million gallon "Spent Fuel Pool Supplemental Water Source" reservoirs might not be there when needed as a backup source of emergency cooling water. This is due to the effect of earthquake-induced seiches which are waves in an enclosed or partially exposed body of water that have been observed on lakes, reservoirs and swimming pools.

Seiches caused by the 1989 magnitude 6.9 Loma Prieta earthquake in the San Francisco Bay area were widespread. Swimming pools and other open-water basins lost much of their water as it sloshed out of the basin. Seiches occurred in close proximity to the earthquakes' epicenter in the Santa Cruz Mountains as well as at places as far away as Walnut Creek, nearly 100 km from the epicenter.

The Tsunami Danger:

Regrettably, the Diablo Canyon nuclear power plant is also vulnerable to tsunami. It sits perched on a bluff that's 85 feet above sea level and, according to Pacific Gas & Electric, its tsunami wall is robust, with the plant expected to survive a wave of up to 25 feet in height. Japanese authorities made similar claims before the wall that protected the Fukushima plant fell. Like the earthquake hazard, the tsunami threat is underestimated. In 1812, the Santa Barbara Channel earthquake produced five tsunami waves in front of the Santa Barbara Presidio. The USGS estimated the largest wave was about 50 feet high.

In 1878, a tsunami at Morro Bay destroyed both Avila and Point Sal piers, and in 1913, a tsunami wrecked the Monterey area. Nearby, at Seaside, immense domes of water appeared to

observers to be higher than the highest sand hills along the shore. (The current quad sheet shows elevations as high as 120 feet.)

The epicenter of the magnitude 9 earthquake and tsunami that struck the Fukushima Daiichi nuclear power plant lay 110 miles offshore, whereas the Shoreline Fault is located within 650 yards of Diablo Canyon. After more than 11 years, the Nuclear Regulatory Commission released a tsunami assessment of the Diablo Canyon nuclear power plant that identified eleven scenarios in which quakes or underwater landslides could produce a tsunami tall enough to damage Diablo. Dr. Robert Sewell's report, "A Preliminary Numerical Study of the Hazard from Local Landslide Tsunami Scenarios at the Diablo Canyon Site in Central California" was released in response to a Freedom of Information Act request by San Luis Obispo Mothers for Peace attorney Diane Curran. The NRC considered Dr. Sewell's devastating report as pre-decisional and exempt from public disclosure.

Diablo's Danger To The Environment:

High temperatures inside the malfunctioning reactors at the Fukushima plant melted and broke down the concrete and metal in the buildings. Silica, zinc, iron, oxygen and cesium-137 fused into millimeter-wide glass micro-particles, each about the size of a pin's head. Lifted into the atmosphere by the fires raging at the plant, they then blew about 150 miles southeast to Tokyo. Radioactive cesium, specifically cesium-137, is one of the waste products of nuclear power. It's also one of the most dangerous substances in a nuclear disaster like Chernobyl or Fukushima. As much as 89% of all of the cesium in Tokyo was in fact in these particles.

To the east of the Diablo Canyon nuclear power plant is the San Joaquin Valley, California's agricultural breadbasket. A large percentage of the food that passes across America's dinner tables comes from the Central Valley. If, somehow, whether caused by nature or accident, Diablo were to lose containment, we would be rendered helpless as immense radioactive clouds rose into the sky where sea-breezes would carry these toxic plumes inland. Nobody is going to buy vegetables and fruit that have been contaminated with radioactive cesium, strontium, and iodine. Can we really afford to lose California's agricultural jewel to a nuclear accident?

Additionally, the drinking water for millions of men, women and children flows from the Sierra Mountains through the Central Valley and into cities that stretch from the Bay Area to Southern California. No one is going to knowingly drink water that's been laced with poisonous radioactive isotopes.

North-South Coastal Traffic Disruption:

A major release of radioactive materials from the Diablo Canyon power plant could disrupt all north-south traffic along California's Central Coast due to prevailing winds which have a tendency to blow inland. There's a strong possibility that people using emergency evacuation routes to escape a nuclear meltdown at Diablo would suffer excessive radioactive exposure.

Killing California's Marine Life:

Every day, Diablo's cooling system sucks in 2.5 billion gallons of seawater. An estimated 1.5 billion fish eggs and marine larvae a year get swept along for the ride, churned, cooked and killed. Over Diablo's 30 year operational lifetime approximately 45 billion fish eggs and marine larvae have died. Another nine years will increase the number to over 58 billion deaths. Simply put, over time the Diablo Canyon nuclear power plant has seriously diminished California's marine populations as well as reduced our oceanic food supply.

The Danger Of Radioactive Saltwater Intrusion Into California's Coastal Fresh-Water Aquifers:

A meltdown at the DCNPP could lead to radioactive saltwater intrusion into California's fresh-water aquifers. Saltwater intrusion, the movement of saline water into fresh-water aquifers can lead to the radioactive contamination of California's agricultural and drinking-water supplies. Human activities, especially groundwater pumping for both crop irrigation and freshwater wells, has increased saltwater intrusion in many of our state's coastal areas. Tsunamis, large storm surges, and rising sea levels can push saltwater even further inland. Brackish water has crept more than 12 miles inland close to Salinas. Watsonville's Pajaro Basin and Orange County are also confronting seawater intrusion. Other coastal regions at risk include Los Osos near San Luis Obispo.

The March 11, 2011 magnitude 9.0 earthquake and tsunami that erupted off of Japan's Tōhoku Pacific coastline lead to a meltdown of four nuclear reactor at the Fukushima Daiichi power plant. Because melt-through reactor cores cannot be allowed to spew radioactive materials into the atmosphere they must be covered with water. This highly radioactive water has been leaking from the molten cores and mixing with groundwater. It has been estimated that about 300 to 400 tons of this extremely radioactive water has entered the Pacific Ocean every day since 2011.

"All radiation is unsafe," said Arnie Gundersen, former nuclear industry executive. "There is no non-harmful level. The faucet is still on. This is not a one time wave that washes the shore and goes away. Fukushima is continuing to pollute the ocean."

If the Diablo Canyon power plant were to experience a Fukushima-like mega-thrust magnitude 9 earthquake and/or tsunami, one or both of Diablo's embrittled reactors could go critical and suffer a Fukushima-like catastrophic nuclear meltdown. At that point we too would be forced to cover the melt-through radioactive cores with copious amounts of water. Because the DCNPP sits right on the coastline, this highly contaminated radioactive water would enter the Pacific Ocean and pollute our coastal fresh water aquifers.

Charged with the awesome responsibility of protecting the State of California and it's people from a devastating nuclear disaster it's important that you take the time to review this crucial information before making a decision to approve Diablo's nine year operational extension, our very lives depend on it. Why bet the whole farm (California) on a over-the-hill nuclear plant? The fact that PG&E made a deal to close the DCNPP in 2025 contingent upon the fact that there would be no Environmental Impact Report (EIR) required for the new tidelands lease should raise a red flag as to the plant's fragility. Please keep us out of Harm's way by closing Diablo down as soon as possible so as to insure that our economy and way of life will continue to prosper.

Harvey Sherback
Berkeley, California

Additional Information:

May 4th, 2016 - Headline: San Andreas Fault 'Locked, Loaded And Ready To Roll' With Big Earthquake, Expert Says

<http://www.latimes.com/local/lanow/la-me-ln-san-andreas-fault-earthquake-20160504-story.html>

June 22, 2016 - Headline: California's San Andreas Fault Is Definitely Moving. Could An Earthquake Be Next?

"The state of California lies at the intersection of two tectonic plates, which puts it at a higher risk of earthquake activity. There are dozens of fault lines separating the two plates throughout the state and the San Andreas Fault is one of the most significant."

<https://www.yahoo.com/news/could-san-andreas-fault-strike-000000008.html>

Department Of Homeland Security Works With Critical Infrastructure Owners And Operators To Raise Awareness Of Cyber Threats

<https://www.dhs.gov/blog/2016/03/07/dhs-works-critical-infrastructure-owners-and-operators-raise-awareness-cyber-threats>

Headline: The Solar Storm Of 2012 That Almost Sent Us Back To A Post-Apocalyptic Stone Age

<http://www.extremetech.com/extreme/186805-the-solar-storm-of-2012-that-almost-sent-us-back-to-a-post-apocalyptic-stone-age>

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http://www.energy.ca.gov/2011_energypolicy/documents/2011-07-

[26_workshop/comments/Douglas_Hamilton_Consultant%20 Geologist Comments TN-61772.pdf](http://26_workshop/comments/Douglas_Hamilton_Consultant%20Geologist_Comments_TN-61772.pdf)

The Diablo Cove Fault Line

From the first establishment of Pacific Gas & Electric's Geoscience Department in 1985 through its presentation at its Senior Seismic Hazard Analysis Committee workshop in the late 2011, the previously well-documented zone of faulting extended through the foundation of the Diablo Canyon nuclear power plant's Unit One's turbine generator and reactor containment was never mentioned.

<http://a4nr.org/wp-content/uploads/2012/02/021012-Hamilton-testimony-014-Full.pdf>

Note: Maps and pictures of Diablo Cove Fault Line:

Page 56 - Figure 1
Page 57 - Figure 2
Page 58 - Figure 3
Page 64 - Figure 9
Page 68 - Figure 13
Page 72 - Figure 17

Headline: Geometry And Earthquake Potential Of The Shoreline Fault, Central California

The Optimal Anisotropic Dynamic Clustering results show that the Shoreline Fault is a single continuous structure that "connects" to the Hosgri Fault.

<http://www.bssaonline.org/content/103/1/447.short>

Jeanne L. Hardebeck "Geometry and Earthquake Potential of the Shoreline Fault, Central California."

Bulletin of the Seismological Society of America 103 (2013): 447, 458. Print.

Public Broadcasting Service. (2011, July 11). Diablo Canyon [Video file]. 8:40-9:19; 12:20-13:55. Retrieved from <http://www.pbs.org/video/2056655205/>

February 8, 2016 - Headline: Earthquakes On Thrust Faults Can Spread 10 Times Farther To A Second Nearby Thrust Fault Than Previously Thought

"The scientists found that an earthquake that initiates on one thrust fault can spread 10 times farther than previously thought to a second nearby thrust fault, vastly expanding the possible range of "earthquake doublets," or double earthquakes."

<http://phys.org/news/2016-02-dose-bad-earthquake-news.html>

Dr. Robert Sewell's report, "A Preliminary Numerical Study Of The Hazard From Local Landslide Tsunami Scenarios At The Diablo Canyon Site In Central California".

<http://www.newtimeslo.com/news/11696/the-nuclear-regulatory-commission-releases-a-tsunami-assessment-of-diablo-canyon-11-years-later/>

Dr. R.T. Sewell's November 22,2003 Summary Report (Draft)

<http://pbadupws.nrc.gov/docs/ML1429/ML14293A559.pdf>

June 30, 2016 - Headline: Scientists Find New Kind Of Fukushima Fallout

<http://www.forbes.com/sites/samlemonick/2016/06/30/scientists-find-new-kind-of-fukushima-fallout/#76e023194126>

July 22, 2015 - Headline: Cover-Up: Fukushima Nuclear Meltdown A Time Bomb Which Cannot Be Defused

Even more ominously, Seiichi Mizuno, a former member of Japan's House of Councillors (Upper House of Parliament, 1995-2001) in March 2015 said: "The biggest problem is the melt-through of reactor cores...we have groundwater contamination. The idea that the contaminated water is somehow blocked in the harbor is especially absurd. It is leaking directly into the ocean. There's evidence of more than 40 known hotspot areas where extremely contaminated water is flowing directly into the ocean. We face huge problems with no prospect of solution."

<https://duanetilden.com/2015/07/22/cover-up-fukushima-nuclear-meltdown-a-time-bomb-which-cannot-be-defused/>

September 23, 2015 - Headline: Here Comes the Sea: The Struggle To Keep The Ocean Out Of California's Coastal Aquifers

"The land is heavy with a harvest that will soon be trucked to grocery stores and fruit stands throughout the United States. The Pacific, in the late afternoon sun, dazzles like camera flashes. But the ocean also is stealthy. It creeps inland in less obvious, more destructive ways. Beneath the berry patch, a rising tide of salty water threatens one of the most lucrative and productive farm regions in the country. Coastal wells are slowly being poisoned with rising concentrations of chloride."

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<http://www.circleofblue.org/2015/world/here-comes-the-sea-the-struggle-to-keep-the-ocean-out-of-californias-coastal-aquifers/>

July 13, 2015 - Headline: Seawater Seeping Into Los Osos Water Basin Poses Threat

"Seawater continues to advance into the drinking water supply that serves Los Osos, a new monitoring report shows. And while the community is cutting back on its water use to counter the effects of the drought, a threat to the basin exists."

<http://www.sanluisobispo.com/news/local/article39056613.html>

March 24, 2015 - Headline: Doomsday Clock Moves Closer To Midnight As California's Last Active Nuke Plant Puts Millions At Risk

"The Diablo Canyon Power Plant near scenic San Luis Obispo on the Golden State's central coast sits in an area where several new fault lines have been discovered over the decades. Controversy flared in 2014 due to revelations about regulatory safety questions from the plant's former senior resident inspector Michael Peck, who served in that role from 2007-12. Peck became concerned that new seismic data suggested the plant was operating outside the safety margins of its license. He issued a non-concurrence in 2012, a Dissenting Professional Opinion in 2013 and a DPO Appeal in 2014."

<http://ecowatch.com/2015/03/24/doomsday-clock-diablo-canyon/>

2012 Title: Michael Peck Diablo Canyon Nuclear Power Plant Non-Concurrence NCP-2012-001.

<http://pbadupws.nrc.gov/docs/ML1215/ML12151A173.pdf>