From:	Hughes, John (Reg Rel
Sent:	8/29/2011 11:41:53 AM
To:	Dietz, Sidney (/O=PG&E/OU=Corporate/cn=Recipients/cn=SBD4); 'Kersten, Colette' (colette.kersten@cpuc.ca.gov)
Cc:	Cherry, Brian K (/O=PG&E/OU=CORPORATE/CN=RECIPIENTS/CN=BKC7); Jacobson, Erik B (RegRel) (/O=PG&E/OU=Corporate/cn=Recipients/cn=EBJ1); Sandoval, Catherine J.K. (catherine.sandoval@cpuc.ca.gov); Katague, Ditas (ditas.katague@cpuc.ca.gov)
Bcc:	
Subject:	RE: Follow Up to Diablo Canyon Tour/Thanks from Commissioner Sandoval and Energy Advisor Colette Kersten

Colette

Sorry for the delay. Various people responsible for the answers were out of the office recently. Please contact me with any follow up questions.

Nuclear Power Plant Licensing considers concurrent events and events resulting from the damage to or failure of plant equipment. Plant procedures are in place to address "station blackout" events where by the ability to feed power to the plant is lost due to either transformer or distribution grid issues. Diesel generators are the primary source for providing emergency power to plant safety systems if off site power is interrupted.

In addition, Diablo Canyon Power Plant's Main Transformers have been fitted with monitoring equipment that is used to track and predict equipment health. Plant operators perform periodic inspections of the transformers, reviewing the temperature of the windings and oil, review any electrical alarms, loss of cooling, loss of oil pumps and general cleanliness. In addition, modifications to the neutral ground were previously implemented. These modification are expected to reduce the risk of equipment damage resulting from solar activity.

Increased solar activity takes place on 11 year cycles. Solar activity has previously impacted the North American Power Transmission Grid. (Reference 1) Diablo Canyon has been through 3 of these solar cycles and has not experienced any problems.

Sandia National Lab, with the assistance of several companies, completed a study for the NRC that examined the interaction of the electromagnetic pulse (EMP) from a high altitude nuclear burst with a focus on the impact to commercial nuclear power plant systems. The EMP from a nuclear burst at the proper altitude is similar to a solar storm in that it could induce large currents and voltages in electrical equipment over the entire continental United States. The study concluded that it is unlikely that an EMP event would fail sufficient equipment so as to prevent safe plant shutdown. (Reference 2).

Although there is some risk associated with equipment damage during increase solar activity periods, the risk to plant operation is minimal.

References

"Solar Storms Effects on Nuclear and Electrical Installations", dated 05/02/2011

NUREG/CR-3069, "Interaction of Electromagnetic Pulse with Commercial Nuclear-Power-Plant Systems", Volume 2, Published February 1983

From: Kersten, Colette [mailto:colette.kersten@cpuc.ca.gov]
Sent: Thursday, August 18, 2011 3:04 PM
To: Dietz, Sidney; Hughes, John (Reg Rel)
Cc: Jacobson, Erik B (RegRel); Sandoval, Catherine J.K.; Katague, Ditas
Subject: Follow Up to Diablo Canyon Tour/Thanks from Commissioner Sandoval and Energy Advisor Colette Kersten

Hi Sid and John,

Thanks so much for facilitating an excellent tour of the Diablo Canyon Power Plant. Both Commissioner Sandoval and I appreciated learning more about what positive steps PG&E is taking to ensure safety that goes "beyond design" specifications! I personally was impressed with the simulation and extensive tour of the protected areas including turbine deck and control room and dry cask storage. Special thanks to the Diablo Canyon management and staff who took time out of their busy day to answer questions and provide some perspective about "lessons learned" you are applying post Fukushima Dai-Ichi Accident!

Following up some comments that Commissioner Sandoval made today at today's Commission meeting, I would like to know to what extent nuclear safety planning includes not only consideration of "concurrent events" (e.g. seismic/tsunami/flood/fire) but also "outside events" such as increasing incidence of solar flares that can set off electrical surges that damage transformers and other equipment in the electrical grid.

For more information about the threat of solar storms, see the attached August 13, 2011 SJ Mercury News article on this issue that has been coined "Space Weather Katrina":

http://www.mercurynews.com/science/ci_18678275?nclick_check=1

As the "Recommendations for Enhancing Reactor Safety in the 21st Century" (USNRC, July 12, 2011) states, "A catastrophic natural disaster would create additional challenges beyond those routinely experienced by state and local emergency planners." (page 58).

Look forward to hearing from you and staying touch with you as reactor safety and emergency preparedness plans progress.

Best Regards,

Colette

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