From: "Maher, William D." <william.maher@exeloncorp.com>
To: "Bob Palla (E-mail)" <rlp3@nrc.gov>, "Duke Wheeler (E-mail)" <dxw@nrc.gov>
Date: 7/11/03 1:17PM
Subject: Draft Quad 6c RAI Response

Attached you will find our draft response to 6c of the RAI's for Quad Cities ER.

If you should have any questions, please feel free to contact me at any time.

Bill

<<AlternateResponse6c.doc>>

****
This e-mail and any of its attachments may contain Exelon Corporation proprietary information, which is privileged, confidential, or subject to copyright belonging to the Exelon Corporation family of Companies. This e-mail is intended solely for the use of the individual or entity to which it is addressed. If you are not the intended recipient of this e-mail, you are hereby notified that any dissemination, distribution, copying, or action taken in relation to the contents of and attachments to this e-mail is strictly prohibited and may be unlawful. If you have received this e-mail in error, please notify the sender immediately and permanently delete the original and any copy of this e-mail and any printout. Thank You.
****

CC: "Fulvio, Albert A." <albert.fulvio@exeloncorp.com>, "Polaski, Fred W." <fred.polaski@exeloncorp.com>, "Nosko, John M." <john.nosko@exeloncorp.com>, "Tzomes, Chancellor" <ca.tzomes@exeloncorp.com>

Response 6(c):

"In the IPEEE submittal, Exelon estimated that after the resolution of the seismic outliers, the plant high confidence in low probability of failure (HCLPF) would be at least 0.24g which is less than the 0.3g review level earthquake used in the IPEEE. During the EPU evaluation, the staff noted that if the HCLPF capacity was increased to 0.3g, the resulting CDF would be about an order of magnitude reduction in risk from the IPEEE plant condition. Please identify the systems, structures, and components (SSCs) that limit the plant HCLPF. For those SSCs below 0.3g, justify why modifications to increase seismic capacity would not be cost beneficial when evaluated consistent with the regulatory analysis guidelines."

Upon completion of the USI A-46 outliers in February, 2003 as noted in Response 6(b), the current HCLPF for Quad Cities is at least 0.24g. The order of magnitude reduction in CDF noted above from the IPEEE plant condition is a conservative estimate based on a plant with a HCLPF of 0.15g. This estimate was made using a bounding method first introduced by Exelon in the RAI responses for the Dresden Extended Power Uprate submittal. Using the same conservative approximations with a plant HCLPF of 0.24g would yield approximately a 2E-6/yr reduction in seismic CDF (i.e., much less than an order of magnitude). However, this should not be compared to a similar reduction in the internal events CDF due to the over-simplification and conservative bias involved in the calculation. Additionally, this 2E-6/yr reduction would be representative of a plant with all SSCs at exactly 0.24g, whose equipment was **all** modified to handle 0.3g. In fact, the majority of SSCs at Quad Cities already have HCLPF values of at least 0.3g.

Thirty-four SSCs or categories of cable trays remain with a HCLPF value of 0.24g or higher, but that have not been verified to 0.3g. These remaining SSCs include the following:

- 4 categories of cable trays where improvements have been made to meet 0.24g, but where walkdowns and re-analysis have not been performed to determine how to qualify them to 0.3g. Significant modifications could be required to further increase the seismic capacity.

- 1 is the 2A 125V battery charger, which is good to 0.27g. Additional anchorage improvements would be required to extend the HCLPF to 0.3g.

- 3 RHRSW pump room coolers. Any modification would involve some complicated scaffolding design and construction, as well as some kind of analysis of the coolers and design of the modifications.

- The balance consists of 4 Switchgear and 22 MCCs. They consist of both essential AC and some 250VDC components. They all are currently considered to have 0.24g HCLPF values. The limit is related to the concrete pad itself and/or bonding of the embedded strap to the concrete.

Some of these components are near walls, but generally they are in the middle of rooms where bracing would involve installing some kind of "legs" to brace them from the floor, and these potential enhancements could hinder access for maintenance or other activities. Further improvements are not practical.

EPRI has estimated that the SQUG modifications resulted in expenses of $1.4M per plant, but it is estimated that Quad Cities had more SQUG outliers than the average plant. To address the items listed above, it is estimated that this would require a similar effort to the SQUG modifications, or more than $2.0M.

Limited benefit would be obtained by improving the plant HCLPF to 0.3g for all SSCs. As noted above, the maximum benefit is conservatively estimated at about 2E-6/yr, but practically the actual maximum benefit is quite less. The cost estimate of more than $2.0M precludes this as being cost-beneficial. Cost benefits from individual improvements can also not be easily made at this time without extensive analysis efforts. As such, it is judged that further modifications to increase seismic capacity are not warranted. The best use of available capabilities is to determine the estimated averted costs and benefits by using the internal events CDF as a measure (with extra margin considered to account for potential benefits from external events as described in Response 7(c)).