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DE_FOIA Resource

From:	Wilson, George (NRC)
Sent:	Thursday, August 25, 2011 5:46 AM
To:	Grobe, Jack; Boger, Bruce; Leeds, Eric; Ruland, William; McGinty, Tim; Lund, Louise; Pruett, Troy; Lubinski, John; Wiggins, Jim; Dapas, Marc; McCree, Victor; Croteau, Rick; Jones, William; Giitter, Joseph; Howe, Allen; Evans, Michele; Holian, Brian; Skeen, David; Galloway, Melanie; Cheok, Michael; Nelson, Robert; Bahadur, Sher; Andersen, James; Dean, Bill; Virgilio, Martin; Borchardt, Bill; Weber, Michael; Johnson, Michael; Holahan, Gary; Merzke, Daniel; Sanfilippo, Nathan; Hayden, Elizabeth; Chokshi, Nilesh; Wert, Leonard; Hiland, Patrick; Skeen, David
Cc:	Li, Yong; Karas, Rebecca; Khanna, Meena; Munson, Clifford; Kammerer, Annie; Manoly, Kamal; Wertz, Trent; Martin, Robert; Thomas, George; Taylor, Robert
Subject:	one pager for chairman on North Anna
Attachments:	1 Pager for Chairman Jaczko on North Anna Earthquake Issue.docx

The attached is the requested one page write up on North Anna from the Chairman's office

George Wilson
USNRC
EICB Branch Chief, Division of Engineering
Mail Stop O12H2
301-415-1711

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Summary of Earthquake Information for the North Anna NPP as of August 24, 2011

The North Anna Nuclear Power Plant (NANPP) has two Safe Shutdown Earthquake (SSE) ground motions, one for structures, systems, and components (SSCs) located on top of rock, which is anchored at 0.12 g, and the other is for SSCs located on top of soil, which is anchored at 0.18 g. The NANPP has two corresponding Operating Basis Earthquake (OBE) ground motion spectra, anchored at 0.09 g for soil and 0.06 g for rock. The figure below shows a comparison between the Safe Shutdown Earthquake (SSE) and OBE for Units 1 and 2, the Unit 3 Combined License (COL) application Ground Motion Response Spectrum (GMRS), the current best estimate of the August 24, 2011 earthquake ground motions from the USGS (ShakeCast version 6), and predicted median and standard deviation earthquake motions using the EPRI ground motion prediction equations. The IPEEE review ground motion (not shown) was anchored at 0.16 g with a similar spectrum as the SSE.

The recent earthquake occurred at a close distance to the plant with a magnitude of 5.8 at a relatively shallow depth. USGS estimates of the maximum ground motion at the plant evolved as new data become available. The current best estimate of the Peak Ground Acceleration (PGA) for the NANPP site is 0.2g, which contains uncertainty and may be updated later. This estimate indicates that the ground motion likely exceeded the SSE response spectra for NANPP Units 1 and 2 (0.12g) over a considerable frequency range, as shown by the green and red points in the figure. The estimated ground motion from the earthquake was not a surprise based on the combined operating license application (COLA) ground motion response spectrum for NANPP Unit 3. This preliminary estimate appears to validate the NRC's current seismic hazard assessment approaches and models for new reactors, as well as the basis for GI-199 reviews.

The USGS ground motion estimate values for the plant site are developed based on two types of input. The principal input are theoretical predicted ground motions that come from analyses in which recorded motions at seismograph stations are extended to the NPP sites using ground motion prediction equations (also called attenuation relationships). This theoretical prediction is then modified based on intensity information that comes from the USGS "Did You Feel It?" (DYFI) system. The DYFI system is a method for using large numbers of inputs from affected persons to develop intensity maps that are used as a "ground truth." Currently, the USGS has received nearly 123,000 submitted reports.

NRC staff performed an independent analysis using the best estimate of the earthquake location and magnitude together with the EPRI ground motion prediction equations. The median and ±1 standard deviation curves are shown. It can be seen that the 84th percentile ground motions calculated by the staff are close to the USGS predictions. This makes sense because the USGS theoretical values were increased due to the intensity information that came out of the DYFI system.

Currently, the licensee is retrieving its seismic instrumentation recordings. However, we do not yet know the type and quality of the recording data that will be available to the NRC. Information from the NANPP will be used to evaluate the USGS estimates of ground motion and will be compared against the FSAR design basis. The data will be used to inform the staff whether additional analysis is needed.

The licensee is expected to perform plant walk downs in accordance with RG 1.167, "Restart of a Nuclear Power Plant Shutdown by a Seismic Event," which endorses EPRI's "Guidelines for Nuclear Plant Response to an Earthquake" with conditions. If the SSE is exceeded at certain

frequencies, the staff will assess the licensee's evaluation of SSCs that are most sensitive to ground motion in that frequency band.