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**Docket:** NRC-2016-0201
Nuclear Power Plant Instrumentation for Earthquakes

**Comment On:** NRC-2016-0201-0001
Nuclear Power Plant Instrumentation for Earthquakes; Draft Regulatory Guide for Comment

**Document:** NRC-2016-0201-DRAFT-0006
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(6)

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## General Comment

RE: ID: NRC-2016-0201-0002
Any attempt to gloss over the facts listed below, should not be accepted in this new DRG.
Even using the limited data Dominion was able to obtain after the VA 2011 5.8 earthquake, shows many exceedances in the proposed new 3rd reactor ESBWR's DCD at North Anna.

North Anna NPP did not have a free field sensor and had other issues when the Aug 23, 2011 VA 5.8 earthquake hit.

*At NAPS, portions of the seismic instrumentation panel inside the main control room were not connected to an uninterruptible power supply and therefore were not functioning during the momentary power outage (approximately 8 seconds) of the emergency busses while the emergency diesel generators started and loaded following the loss of offsite power. This resulted in an inability of the plant operators to promptly determine if the ground motion levels exceeded the OBE or Safe Shutdown Earthquake (SSE, also referred to as Design Basis Earthquake) levels, since the 3.1 seconds of strong ground motion portions of the earthquake in each of the three orientations occurred during the 8 second power outage. Although the seismic event resulted in an automatic shutdown (initiated by a power range nuclear instrument high negative flux rate) of both operating units at NAPS, the licensee could not immediately confirm conclusively that the plant had its OBE or SSE levels exceeded until the Kinemetrics triaxial seismic time history accelerograph recording was analyzed. The

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Template = AOM-013
E-RIDS = AOM-03
Add = S. Tabatabai (SHE1)
E. O'Donnell (EXO)

Kinemetrics tri-axial seismic time history accelerograph recorder had been powered via a battery-backed power supply.

*An additional consequence of the momentary loss of power to the seismic instrumentation panel in the control room was that the site could not use the seismic response entry criteria to enter the Emergency Action Level (EAL) matrix for a seismic event. The entry criteria for the Seismic Response EAL required that the Engdahl strong motion accelerograph peak shock annunciator illuminate, which would indicate a seismic event greater than OBE. Since there was a momentary loss of power, this annunciator did not illuminate. It is important to note that the lack of control panel alarm from the seismic monitoring panel did not delay an Alert declaration. The Shift Manager used a different EAL matrix entry criteria, (i.e., Shift Manager judgement), and appropriately declared an Alert.
*NAPS, which had instrumentation conforming to RG 1.12, Revision 1, had no seismic monitoring instrumentation located on the free surface in the free field. Free field instrumentation data can generally be compared more accurately to the original design input motion to validate the seismic engineering design for the structures, systems and components at the site. The recordings from instrumentation located at the containment basemat, because of influence of the structure itself as well as interaction with the surrounding materials and structures, are typically not as accurate for determining input ground motion data from the earthquake.
*The data recorded by the Engdahl (scratch-plate) style seismometers was not as complete as the data recorded by the Kinemetrics (accelerometer-based) equipment for the instruments located on the basemat of Unit 1. The recorded data indicated significant differences in the amplitude of the motion recorded at various frequencies between the scratch-plate style IN 2012-25 Page 4 of 5
seismometers and the accelerometer based seismic instrumentation.
* Further, no data was recorded for two frequencies of interest on the scratch-plate instruments, while the accelerometer based instruments indicated seismic motion was occurring and recorded data for those frequencies.
* the Kinemetrics SMA-3 seismic monitors at the site did not trigger during the event, leading the licensee to declare the seismic monitors inoperable.
http://www.nrc.gov/docs/ML1215/ML121590444.pdf

This was put out in the 70's: Review of Current Standards and Practice for Earthquake Instrumentation at Nuclear Plants:
http://www.iitk.ac.in/nicee/wcee/article/6_vol3_2962.pdf

Why has the NRC failed to demand implementation of modern day seismic instrumentation at all of our nuclear power plants and one has to wonder why The Channel Check, which is/was a qualitative verification of the functional status of the instrument, sensor and system was ignored, deleted, dismissed or simply forgotten regarding seismic standards and practice?

Again, ignoring the facts will and can cause harm!
Free field instrumentation data can generally be compared more accurately to the original design input motion to validate the seismic engineering design for the structures, systems and components at the site.