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From: Wilson, George
To: Wilson, George; 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; Brown, Frederick; Glitter, 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
Cc: Li, Yong; Karas, Rebecca; Khanna, Meena; Munson, Clifford; Kammerer, Annie; Manoly, Kamal
Subject: RE:
Date: Wednesday, August 24, 2011 1:53:29 PM
Attachments: shakecast_report_nrc.pdf

This email contains an update of the ground motion estimate of the North Anna site based on the latest USGS data. The current best estimate of the PGA for the rock is 0.2g, which contains significant uncertainty. The SSE of the North Anna NPP is 0.12g.

It should be noted that the initial estimate from Version 1 of the ShakeCast report was based on very preliminary information. The present Version 6 is attached. As information has become available, the ground motion estimate, particularly the location and magnitude of earthquake has become better constrained. This is due to aftershock information and intensity information from the USGS "Did You Feel It?" system, which provides a level of "ground truthing". We just spoke to the USGS and they think that the numbers have stabilized, however we will provide further updates as we receive them.

The underlying data comes from something called a ShakeMap, which is the information that the USGS puts out to the public. North Anna is on hard rock which may further amplify the incoming motions. It appears that there are many indications that the SSE was exceeded.

Currently, the licensee is retrieving their seismic recording instrumentation. However, we do not yet know the type and quality of the recording data that will be available to the NRC. Information from the NPP will be used to evaluate the USGS estimates of ground motion and to compare with FSAR design basis. The data will also inform the staff if additional analysis is needed.

-----Original Message-----

From: Wilson, George
Sent: Wednesday, August 24, 2011 10:35 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; Brown, Frederick; Glitter, 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
Cc: Li, Yong; Karas, Rebecca; Khanna, Meena; Munson, Clifford; Kammerer, Annie; Manoly, Kamal
Subject: FW:

The following attachment includes the following

The latest shake cast report from the USGS - this shows that the peak ground motion was .16g. The Design for North Anna is .12g. The North Anna Spectral curve from Numark/FSAR and spectral curve from earthquake. You can see where the data from the earthquake exceeds design curve above 10hz. The next picture shows the same curve outlay from the IPEEE submittal. Reg Guide 1.166 for the after earthquake guidance.

This info is still draft and preliminary.

-----Original Message-----

From: GEORGE.WILSON@NRC.GOV [<mailto:george.wilson@nrc.gov>]

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Sent: Wednesday, August 24, 2011 9:44 AM
To: Wilson, George
Subject:



U.S.NRC

ShakeCast Report



Magnitude 5.8 - VIRGINIA

Origin Time: 2011-08-23 17:51:04 GMT

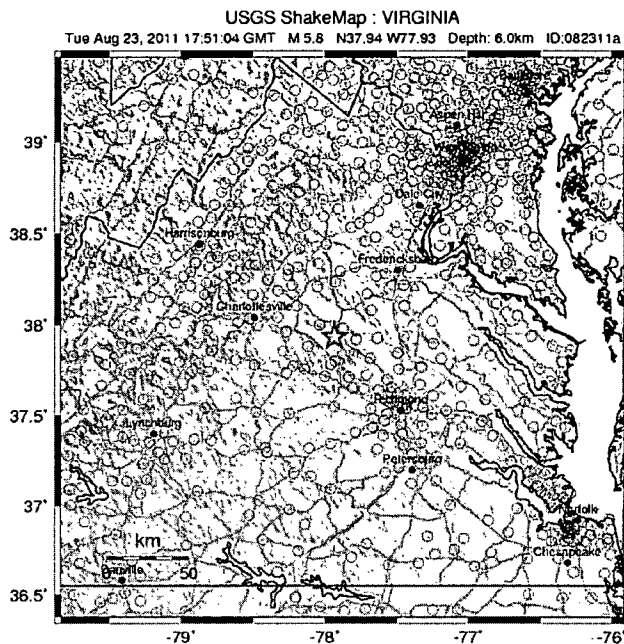
Latitude: 37.9360 Longitude: -77.9330

Version 6

Created: 2011-08-24 15:11:29 GMT

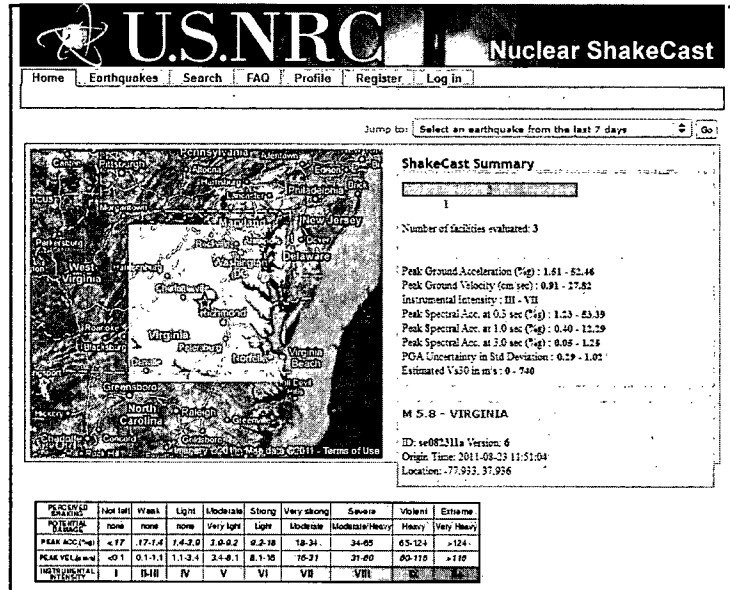
Depth: 6.0 km

These results are from an automated system and users should consider the preliminary nature of this information when making decisions relating to public safety. ShakeCast results are often updated as additional or more accurate earthquake information is reported or derived.



Map Version 6 Processed Wed Aug 24, 2011 08:50:09 AM MDT - NOT REVIEWED BY HUMAN

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate to heavy	Heavy	Very Heavy
PEAK ACC (%g)	< 0.17	0.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	> 124
PEAK VEL (cm/s)	< 0.1	0.1-1.1	1.1-3.4	3.4-9.1	9.1-16	16-31	31-60	60-116	> 116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X



Recent significant earthquakes in the region

M4.5 VIRGINIA at 12/9/2003 20:59

FACILITY TYPE	FACILITY ID	FACILITY NAME	DIST	LATITUDE	LONGITUDE	DAMAGE LEVEL	MMI	PGA	PGV	PSA03	PSA10	PSA30
NUCLEAR	USA37	North Anna	18.08	38.0573	-77.7956	YELLOW	VI	19.9918	12.2568	26.0078	5.9443	0.5989
NUCLEAR	USA8	Calvert Cliffs	141.73	38.4319	-76.4424	GREEN	V	6.8436	6.7083	3.5967	1.4285	0.1501
NUCLEAR	USA56	Surry	139.06	37.1633	-76.6942	GREEN	V	6.1296	6.5473	3.5591	1.4118	0.1482

* - MMI level may extend beyond map boundary; some facilities may not appear on the map due to space restriction