



North Anna Nuclear Power Plant Seismic Event

Presentation to the Commissioners
August 30 and September 1, 2011

North Anna Design Basis

- North Anna Nuclear Power Plant (NANPP) has two Design Basis Earthquake (DBE)* values
- Structures, systems, and components (SSCs) founded on top of rock anchored at 0.12 g and SSCs founded on top of soil anchored at 0.18 g
- NANPP has two corresponding Operating Basis Earthquake (OBE) values, anchored at 0.06 g for rock and 0.09 g for soil (OBE is 1/2 of the DBE)

* Design Basis Earthquake means the same as Safe Shutdown Earthquake

Sequence of Events

- On August 23, 2011, North Anna Power Station declared an Alert due to significant seismic activity onsite from an earthquake which had a measured magnitude of 5.8.
- The licensee conducted the 1st general walkdown of the plant as required by the North Anna Power Station abnormal procedure for seismic event.
- The licensee conducted the 2nd walkdown after the magnitude 4.5 aftershock.
- Seismic Response Spectrum Recorder (scratch plate) readings identified that the Design Basis Earthquake had been exceeded at certain frequencies.
- On August 26, the licensee declared all safety-related SSCs of Units 1 and 2 inoperable and issued a 10 CFR 72 Notification

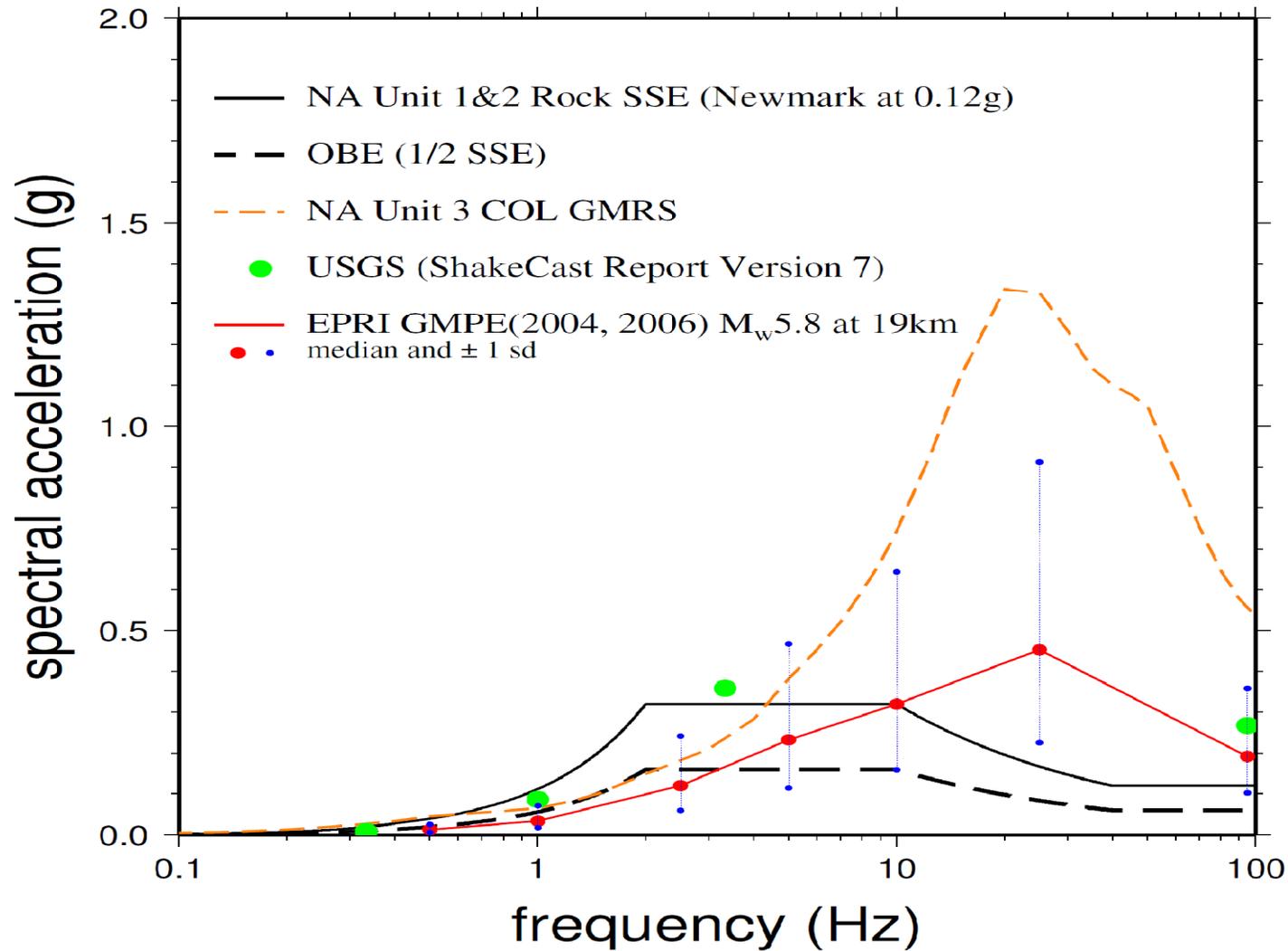
History Of Seismic Events

- Exceedance of the DBE is an unprecedented event at an operating unit
- While Perry Unit was under construction, an earthquake occurred that exceeded SSE at high frequency (15hz)
 - A special safety inspection was conducted by the NRC's Region III Staff on February 5–7, 1986. See Inspection Reports 50–440/86005 and 50–440/86006. This included a post-earthquake walkdown and visual inspection of an extensive list of safety-related systems and components.

Regulatory Requirements

- Appendix A to Part 100—Paragraph V(a)(2) states, *"If vibratory ground motion exceeding that of the Operating Basis Earthquake occurs, shutdown of the nuclear power plant will be required.*
 - *Prior to resuming operations, the licensee will be required to demonstrate to the Commission that no functional damage occurred to those features necessary for continued operation without undue risk to the health and safety of the public."*
- *10 CFR 50.54 (ff) contains similar language for Appendix S plants. (Appendix S applies to Part 52 applicants and operating reactor construction permits submitted on or after Jan. 10, 1997)*
- Director of NRR will authorize restart

Staff Initial Assessment



Licensee Initial Assessments

- Licensee's evaluation of seismic instruments indicate that the SSE was exceeded at some frequencies
- Information from NANPP's seismic recordings will be utilized by the staff to assist in the assessment of the licensee's operability determination

Augmented Inspection Team

- AIT was dispatched today, which will be conducted in accordance with MD 8.3, "NRC Incident Investigation Program."
- Objectives of the AIT include:
 - Collect, analyze and document factual information and evidence
 - Assess licensee's actions and plant equipment response during the earthquake and aftershocks
 - Conduct independent extent of condition review
 - Collect information to support final determination of risk significance of event
 - Identify generic issues associated with the event

Other Potentially Affected Plants

- The list below provides the plants and the associated distance from the Epicenter:
 - North Anna is 18 km from the Epicenter
 - Surry is 139 km from the Epicenter
 - Calvert Cliffs is 141 km from the Epicenter
- NRR will confirm that the OBE was not exceeded at Surry and Calvert Cliffs.