

9/1/2011  
76 FR 54507

# PUBLIC SUBMISSION

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<b>As of:</b> November 16, 2011
<b>Received:</b> November 14, 2011
<b>Status:</b> Pending_Post
<b>Tracking No.</b> 80f6c32e
<b>Comments Due:</b> November 15, 2011
<b>Submission Type:</b> Web

**Docket:** NRC-2011-0204

Proposed Generic Communication - Draft Generic Letter on Seismic Risk Evaluations for Operating Reactors

**Comment On:** NRC-2011-0204-0002

Proposed Generic Communication; Draft NRC Generic Letter 2011-XX: Seismic Risk Evaluations for Operating Reactors

**Document:** NRC-2011-0204-DRAFT-0015

Comment on FR Doc # 2011-23706

## Submitter Information

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RULES AND REGULATIONS

## General Comment

Peter Melzer  
109 Woodstock Dr.  
Charlottesville, VA 22901  
Nov. 14, 2011

To: The U.S. Nuclear Regulatory Commission  
Re: Docket ID NRC-2011-0204; Title: NRC SEEKS PUBLIC INPUT ON DRAFT GENERIC LETTER REGARDING UPDATED SEISMIC ANALYSES FOR U.S. NUCLEAR REACTORS (No. 11-164: Proposed Generic Communication; Draft NRC Generic Letter 2011-XX: Seismic Risk Evaluations for Operating Reactors).

Dear Sir/Madame:

I am writing in response to your call for suggestions to the draft of a generic letter (Docket ID NRC-2011-0204) that the U.S. Nuclear Regulatory Commission (NRC) is planning to send to nuclear power station (NPS) operators with the request to re-evaluate their stations' seismic safety/risk and provide that information to the NRC.

I wish to use this opportunity to propose that the NRC kindly requests from the NPS operators to include in this re-evaluation three concerns of fundamental importance to seismic safety/risk:

SUNSI Review Complete  
Template - ADM-013

E-R105 = ADM-03  
Add: K. Manoly (KAM)

- 1) seismic risk reduction through automatic seismic scram,
- 2) seismic risk re-evaluation of ultimate heat sinks, and
- 3) seismic risk re-evaluation of all structures, systems and components of the emergency core cooling system.

My concerns are discussed in detail in the full letter attached.

Thank you very much for your consideration.

Faithfully yours,

Peter Melzer

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## Attachments

letter\_nrc

<http://www.regulations.gov/#!documentDetail;D=NRC-2011-0204-0002>

NRC-2011-0204

Peter Melzer  
109 Woodstock Dr.  
Charlottesville, VA 22901

The U.S. Nuclear Regulatory Commission

Re: Docket ID NRC-2011-0204; Title: NRC SEEKS PUBLIC INPUT ON DRAFT GENERIC LETTER REGARDING UPDATED SEISMIC ANALYSES FOR U.S. NUCLEAR REACTORS (No. 11-164: Proposed Generic Communication; Draft NRC Generic Letter 2011-XX: Seismic Risk Evaluations for Operating Reactors).

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I wish to use this opportunity to propose that the NRC kindly requests from the NPS operators to include in this reevaluation three concerns of fundamental importance to seismic safety/risk:

**1) seismic risk reduction through automatic seismic scram**

Only few commercial nuclear power stations in the U.S. are outfitted with the equipment needed to automatically scram the reactors when they are subjected to ground motion above a preset point. Events at North Anna NPS near the epicenter of the magnitude 5.8 Virginia earthquake on Aug. 23, 2011, however, showed that automatic seismic scrams may have benefitted the operators in expediently shutting down the station's two reactors. Therefore, NPS operators should be asked to evaluate whether **state-of-the-art automated seismic scram systems** would improve NPS safety in the assessment that the NRC will require in the upcoming generic letter.

**2) seismic risk re-evaluation of ultimate heat sinks**

The reactor core decay heat persisting after a scram must be transferred to the ultimate heat sink. For example, North Anna NPS uses an artificial reservoir separated from Lake Anna by an earthen dam as ultimate heat sink. The heat transfer to the ultimate sink is crucial to cooling the reactors, preventing fuel core meltdowns with disastrous consequences as the reactor accidents at Fukushima 1 NPS last March strikingly demonstrate. The **preservation of the ultimate heat sink** and its use via residual heat removal systems are of existential importance to reactor safety. In the planned generic letter, the NRC should, therefore, encourage NPS operators to re-evaluate the seismic risk to the ultimate heat sink as part of structures, systems, and components (SSC) important to safety at nuclear power reactors that must be designed to withstand the

effects of natural phenomena, including earthquakes, without losing the capability to perform their intended safety functions.

### **3) seismic risk re-evaluation of all structures, systems and components of the emergency core cooling system**

All SSC of the **emergency core cooling system**, including all piping, valves and condensate storage tanks, are important to safety and should be re-evaluated for their contribution to seismic risk. Depending on reactor type, the SSC may comprise the components of the reactor core isolation system, the high pressure coolant injection system and core sprayers. Particular attention must be paid to SSC built on soil and their connections with SSC built on rock. Differences in ground motion may result in damage to the connections between SSC built on rock and soil.

In respect to the first concern raised above, I have followed with great interest the public meetings convened by the NRC in Rockville, MD, on Sep. 8, and Oct. 21, 2011, discussing preliminary findings by the operator of North Anna NPS Virginia Electric and Power Company (VEPCO) on the effects of the Aug. 23, 2011, earthquake. Both reactors of the NPS scrambled. On Sep. 28, VEPCO informed the NRC that negative power flux rates at the station precipitated the scrams. The precise cause of the negative flux rates remains to be resolved. Analyses of seismic recordings from the site suggest that quake ground shaking exceeded the design basis of some structures, systems, and components. The September 8 meeting revealed that the control room operators lacked information on containment baseman motion when they needed it most. At the time of the quake seismic instruments had lost power. The alarms failed that would have informed the operators that the ground motion warranted a shutdown.

I suggest this shortcoming could have been avoided, had an automatic seismic scram system been in place. In that case, issues related to seismic design and safe shutdown earthquake would have been resolved at an early planning stage of the power station, a trip point would have been set. The instrumentation to detect and record ground motion would have been equipped with independent power backup to maintain automatic seismic scram capability. In fact, it seems prudent to independently retrofit **all seismically important instrumentation with 24 hour-lived batteries** to reduce the seismic vulnerability of structures, systems and components. Solar powered sources may further extend battery life.

In support of the second concern raised above, WTVR CBS 6 Richmond, VA, reported in a news broadcast on Aug. 25, 2011, with the title "Mineral residents concerned about Nuclear power plant" (link: <http://www.wtvr.com/videobeta/1a0ae718-372c-4986-84e1-d940ddfd1470/News/Mineral-residents-concerned-about-Nuclear-power-plant>) that the water level of Lake Anna had fallen roughly two feet after the quake. Lake Anna is a dammed body of water. At the September 8 meeting in Rockville, VEPCO stated that an inspection of their dam provided no evidence of quake damage. At the Oct. 21 meeting, VEPCO clarified that Lake Anna and its main dam do not represent the ultimate heat sink for the decay heat of the reactor fuel cores during shutdown. This function is served by a smaller body of

water separated from the lake by another dam, which VEPCO maintains and inspected after the quake. Regardless of this barrier, VEPCO's reservoir is not independent from Lake Anna, and the question remains to be answered what precisely precipitated the reported rapid diminution of water levels in the lake. Uncovering its cause and whether such diminution could potentially affect VEPCO's reservoir might be important to the seismic safety of North Anna's ultimate heat sink.

In support of the third concern raised above, I refer to the accident report on Fukushima 1 (Dai-ichi) NPS with the title "Report of Japanese Government to the IAEA Ministerial Conference on Nuclear Safety - The Accident at TEPCO's Fukushima Nuclear Power Stations - " submitted by the Government of Japan to the International Atomic Energy Agency in June, 2011 (<http://www.iaea.org/newscenter/focus/fukushima/japan-report/>). The report shows that efforts of the operators of Fukushima Dai-ichi NPS to prevent the meltdowns of three fuel cores were hampered profoundly by the failure of emergency core cooling systems, particularly the reactor core isolation cooling system, the high pressure coolant injection system and failed isolation condensers. Therefore, it must be ensured that all components of the emergency core cooling system, including all valves, piping and condensate storage tanks, conform to the highest seismic safety standards and can withstand the ground motion a particular NPS is anticipated to incur by substantial margin.

In conclusion, I commend VEPCO and the NRC for their forthright and transparent effort of keeping the public abreast of the on-going investigation into the effects of the Virginia earthquake on North Anna NPS. The unanticipated reactor shutdowns at the station must be of concern to those who live in its proximity. The September 8 and October 21 meetings represent excellent examples of the striving of all stakeholders to learn from the events surrounding the shutdowns and improve defense-in-depth at North Anna NPS. I hope that the will for collaboration and transparency that the stakeholders demonstrated at both meetings will continue during the restart of the reactors to the benefit of the station's safety and will serve as a role model for stakeholder interaction that will ensue from the NRC's planned generic letter.

Moreover, I wish to emphasize that the three concerns raised in the present letter pertain not only to North Anna NPS, but also to any other NPS at seismic risk. Therefore, I request that the NRC kindly considers the inclusion of my concerns in the planned generic letter concerning the improvement of seismic nuclear power station safety.

Thank you very much for your consideration.  
Faithfully yours,  
Peter Melzer

seismically-vulnerable structures, systems, and components (SCCs)  
exceeding safe-shutdown earthquake (SSE)

Sep., 2011, update of the report of the Government of Japan to the International Atomic

Energy Agency on the reactor accidents at Fukushima I Nuclear Power Station in the wake of the Tohoku earthquake and tsunami on Mar. 11, 2011, chapter I.  
<http://www.iaea.org/newscenter/focus/fukushima/japan-report2/japanreport120911.pdf>