

LeeRAIsPEm Resource

From: Brian Hughes
Sent: Friday, October 03, 2008 12:38 PM
To: LeeRAIsPEm Resource
Subject: LEE-RAI-LTR-027.doc REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 027
RELATED TO SRP SECTION 2.5.2 FOR THE WILLIAM STATES LEE III UNITS 1 AND 2
COMBINED LICENSE APPLICATION
Attachments: LEE-RAI-LTR-027.doc

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Subject: LEE-RAI-LTR-027.doc REQUEST FOR ADDITIONAL INFORMATION LETTER
NO. 027 RELATED TO SRP SECTION 2.5.2 FOR THE WILLIAM STATES LEE III UNITS 1 AND 2
COMBINED LICENSE APPLICATION

Sent Date: 10/3/2008 12:38:25 PM

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From: Brian Hughes

Created By: Brian.Hughes@nrc.gov

Recipients:

"LeeRAIsPEm Resource" <LeeRAIsPEm.Resource@nrc.gov>

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Expiration Date:

Recipients Received:

P.Hastings

October 3, 2008

Mr. Peter S. Hastings, P.E.
Licensing Manager, Nuclear Plant Development
Duke Energy
526 South Church Street
Charlotte, NC 28201-1006

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 027 RELATED TO
SRP SECTION 2.5.2 FOR THE WILLIAM STATES LEE III UNITS 1 AND 2
COMBINED LICENSE APPLICATION

Dear Mr. Hastings:

By letter dated December 12, 2007, as supplemented by letters dated January 28, 2008, February 6, 2008 and February 8, 2008, Duke Energy submitted its application to the U. S. Nuclear Regulatory Commission (NRC) for a combined license (COL) for two AP1000 advance passive pressurized water reactors pursuant to 10 CFR Part 52. The NRC staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter.

To support the review schedule, you are requested to respond within 30 days of the date of this letter. If changes are needed to the final safety analysis report, the staff requests that the RAI response include the proposed wording changes.

P.Hastings

If you have any questions or comments concerning this matter, you may contact me at 301-415-6582.

Sincerely,

/RA/

Brian Hughes, Senior Project Manager
AP1000 Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 52-018
52-019

Enclosure:
Request for Additional Information

CC: see next page

P.Hastings

If you have any questions or comments concerning this matter, you may contact me at 301-415-6582.

Sincerely,

/RA/

Brian Hughes, Senior Project Manager
AP1000 Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 52-018
52-019

eRAI Tracking No. 1141

Enclosure:
Request for Additional Information

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NRO-002

OFFICE	RGS2/BC	RHEB	OGC	NWE1/L-PM
NAME	CMunson*	JStirewalt*	MSpencer*	BHughes*
DATE	8/18/08	9/18/08	08/29/08	10/03/08

*Approval captured electronically in the electronic RAI system.

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Request for Additional Information No. 1141 Revision 0
William States Lee III, Units 1 and 2
Duke Energy Carolinas, LLC
Docket No. 52-018 and 52-019
SRP Section: 02.05.02 - Vibratory Ground Motion
Application Section: 2.5.2

QUESTIONS for Geosciences and Geotechnical Engineering Branch 2 (RGS2)

02.05.02-1

RAI on the Dames & Moore issue – Lee Site

In Section 2.5.2.2.1.2 and Table 2.5.2-203 of the Lee FSAR, the Dames and Moore source characterization parameters derived for the EPRI/SOG assessment are presented for Zones 41 (the Southern Cratonic Margin) and 53 (the Southern Appalachian Mobile Belt). Relatively low probabilities of activity were assigned to these two zones by the Dames and Moore team.

Please justify the source characterization parameters used by the Dames and Moore team for Zones 41 and 53 to assess the seismic hazard of the region surrounding the Lee site. Considering the low probability values selected by the Dames and Moore team, please also justify the conclusion that the source characterization for Zones 41 and 53 still falls within the range of scientific peer community views for Central and Eastern U.S. (CEUS) seismic hazard interpretations.

02.05.02-2

RAI on the East Tennessee Seismic Zone – Lee Site

The Eastern Tennessee Seismic Zone (ETSZ), considered to be one of the most active seismic areas east of the Rocky Mountains, lies within the Lee COL site region (i.e., within 320 km (200 mi) of the site). Recent studies have indicated that this seismic zone may possess the potential to produce large-magnitude earthquakes. However, although new information on seismic hazard exists for the ETSZ, the Lee COL application does not present source models for the zone that are updated from the 1986 Electric Power Research Institute Seismic Owners Group (EPRI/SOG) report. The staff is concerned that the EPRI/SOG seismic source models for the region may not adequately characterize the potential for larger earthquakes in the ETSZ due to the low weighting for larger earthquakes and the low probabilities of activity for seismic sources assigned by some of the EPRI/SOG expert teams.

Section 2.5.2.2.2.5 of the Lee COL application discusses adequacy of the EPRI/SOG source models based only on the maximum magnitude parameter. In addition to maximum magnitude, however, there are several other variables (e.g., probability of activity, source location, and recurrence) that contribute to overall seismic hazard for the site. The application does not adequately address the effects of these other parameters derived from the newer information sources for the Lee probabilistic seismic hazard analysis (PSHA).

There are more recent seismic hazard studies (e.g., the Geomatrix TVA dam safety study and the Lawrence Livermore National Laboratory Trial Implementation Project (TIP) study) which provide new information on the seismic hazard of the area. Regulatory Guide 1.208 states that new information should be considered when evaluating the applicability of the EPRI/SOG hazard curves for a site. If the

effect on the hazard is significant, the Lee PSHA should be updated to include the newer information. The application does not currently include detailed numerical comparisons of the EPRI/SOG hazard and the newer studies.

In regard to assessment of seismic hazard in the ETSZ, please provide the following additional information sets:

- a) PSHA mean hazard curves for the Lee COL site using Geomatrix TVA dam safety study and TIP study seismic source models, together with the EPRI 2004 ground motion models, and compare these hazard curves with the six EPRI/SOG PSHA hazard curves for the site.
- b) Separate mean hazard curves for the Charleston and New Madrid seismic source zones to enable staff to directly assess their impact relative to the newer source models and the EPRI/SOG source models.
- c) A discussion and basis for including, or not including, the newer source models in the overall final PSHA. If the determination is that the newer source models need to be included in the overall final PSHA, include that final PSHA in the response.
- d) Mean 1 Hz and 10 Hz hazard curves for each EPRI team for each of their sources in a spreadsheet table as well as a figure.

02.05.03-6

In FSAR Section 2.5.3.1.6 (page 2.5-146), a northeast-trending, linear topographic ridge that is 7.2 km (4.5 mi) long is described as resulting from erosion of resistant quartzite layers by London Creek based on information derived from aerial reconnaissance and field studies. This linear feature is located approximately 3.2 km (2 mi) northwest of the site and parallels the predominant northeastern trend of regional tectonic structures.

Please summarize the information gleaned from aerial reconnaissance and field investigations which led to the conclusion that this feature is non-tectonic in origin and the result of erosion although it parallels the northeastern trend of tectonic structures in the region.

02.05.03-7

In FSAR Section 2.5.3.1.6 (pages 2.5-145 and 2.5-146), two bullets state that 1:20,000-scale black and white and 1:40,000-scale color infrared aerial photographs (dated 1959 and 1994, respectively) cover the "majority" of the site area.

Please qualify what part, if any, of the site area was not covered by the aerial imagery to ensure that a careful assessment of potential geomorphic features indicative of tectonic deformation was undertaken.

02.05.03-8

FSAR Section 2.5.3.2 (pages 2.5-146 through 2.5-147) discusses five bedrock faults of proposed Paleozoic age which are mapped within the site vicinity. The Brindle Creek fault is not included, even though a segment of this structure appears to occur in the site vicinity (Figure 2.5.1-210). There is no concise summary of information in the FSAR from the references cited that documents a Paleozoic age for these structures in either FSAR Section 2.5.3.2 or FSAR Section 2.5.3.4 ("Ages of Most Recent Deformation"). Also, it is not obvious from the text or cited figures how these structures relate to

regional boundaries of lithotectonic terranes, including the Charlotte terrane of the Carolina Zone in which the site lies.

Please provide a summary of published evidence for the proposed Paleozoic age of the faults discussed, including the Brindle Creek fault. Please prepare a figure to illustrate how these structures relate to regional boundaries of lithotectonic terranes, including the Charlotte terrane of the Carolina Zone in which the Lee site is located.

02.05.03-9

FSAR Section 2.5.3.6 (page 2.5-149) states that data are presented throughout Section 2.5.1 documenting that there is no evidence for capable tectonic sources within the Lee site vicinity. However, these important data are not adequately summarized in FSAR Section 2.5.3.6.

Please summarize the pertinent data from FSAR Section 2.5.1 which documents the conclusion that no capable tectonic sources exist in the site vicinity.