

## PMTurkeyCOLPEm Resource

---

**From:** Comar, Manny  
**Sent:** Thursday, November 01, 2012 5:06 PM  
**To:** TurkeyCOL Resource  
**Subject:** FW: DRAFT RAI Responses FPL Turkey Point 6 & 7 for eRAI 5896 Vibratory Ground Motion - Part 3 of 4  
**Attachments:** Draft Revised Response for NRC RAI Letter No. 037 (eRAI 5896) 2.5.2-13.pdf

---

**From:** Franzone, Steve [<mailto:Steve.Franzone@fpl.com>]  
**Sent:** Monday, September 17, 2012 8:46 PM  
**To:** Comar, Manny  
**Cc:** Maher, William; Burski, Raymond  
**Subject:** DRAFT RAI Responses FPL Turkey Point 6 & 7 for eRAI 5896 Vibratory Ground Motion - Part 3 of 4

Manny,  
To support a future public meeting, FPL is providing draft revised responses for eRAI 5896 (RAI question 02.05.02-13) in the attached file.

DRAFT RAI Responses FPL Turkey Point 6 & 7 for eRAI 5896 Vibratory Ground Motion - email 3 of 4 dated 20120917 and in the following 1 e-mail transmittals.

If you have any questions, please contact me.

Thanks

Steve Franzone

NNP Licensing Manager - COLA

" Words may show a man's wit, but actions his meaning" ~ Benjamin Franklin

561.694.3209 (office)

754.204.5996 (cell)

"This transmission is intended to be delivered only to the named addressee(s) and may contain information that is confidential and /or legally privileged. If this information is received by anyone other than the named addressee(s), the recipient should immediately notify the sender by E-MAIL and by telephone (561.694.3209) and permanently delete the original and any copy, including printout of the information. In no event shall this material be read, used, copied, reproduced, stored or retained by anyone other than the named addressee(s), except with the express consent of the sender or the named addressee(s).

**Hearing Identifier:** TurkeyPoint\_COL\_Public  
**Email Number:** 689

**Mail Envelope Properties** (377CB97DD54F0F4FAAC7E9FD88BCA6D0B1656EF961)

**Subject:** FW: DRAFT RAI Responses FPL Turkey Point 6 & 7 for eRAI 5896 Vibratory  
Ground Motion - Part 3 of 4  
**Sent Date:** 11/1/2012 5:06:02 PM  
**Received Date:** 11/1/2012 5:06:05 PM  
**From:** Comar, Manny

**Created By:** Manny.Comar@nrc.gov

**Recipients:**  
"TurkeyCOL Resource" <TurkeyCOL.Resource@nrc.gov>  
Tracking Status: None

**Post Office:** HQCLSTR01.nrc.gov

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>	
MESSAGE	1464	11/1/2012 5:06:05 PM	
Draft Revised Response for NRC RAI Letter No. 037 (eRAI 5896) 2.5.2-13.pdf			492322

**Options**  
**Priority:** Standard  
**Return Notification:** No  
**Reply Requested:** No  
**Sensitivity:** Normal  
**Expiration Date:**  
**Recipients Received:**

**NRC RAI Letter No. PTN-RAI-LTR-037**

**SRP Section: 02.05.02 - Vibratory Ground Motion**

Question for Geosciences and Geotechnical Engineering Branch 1 (RGS1)

**NRC RAI Number: 02.05.02-13 (eRAI 5896)**

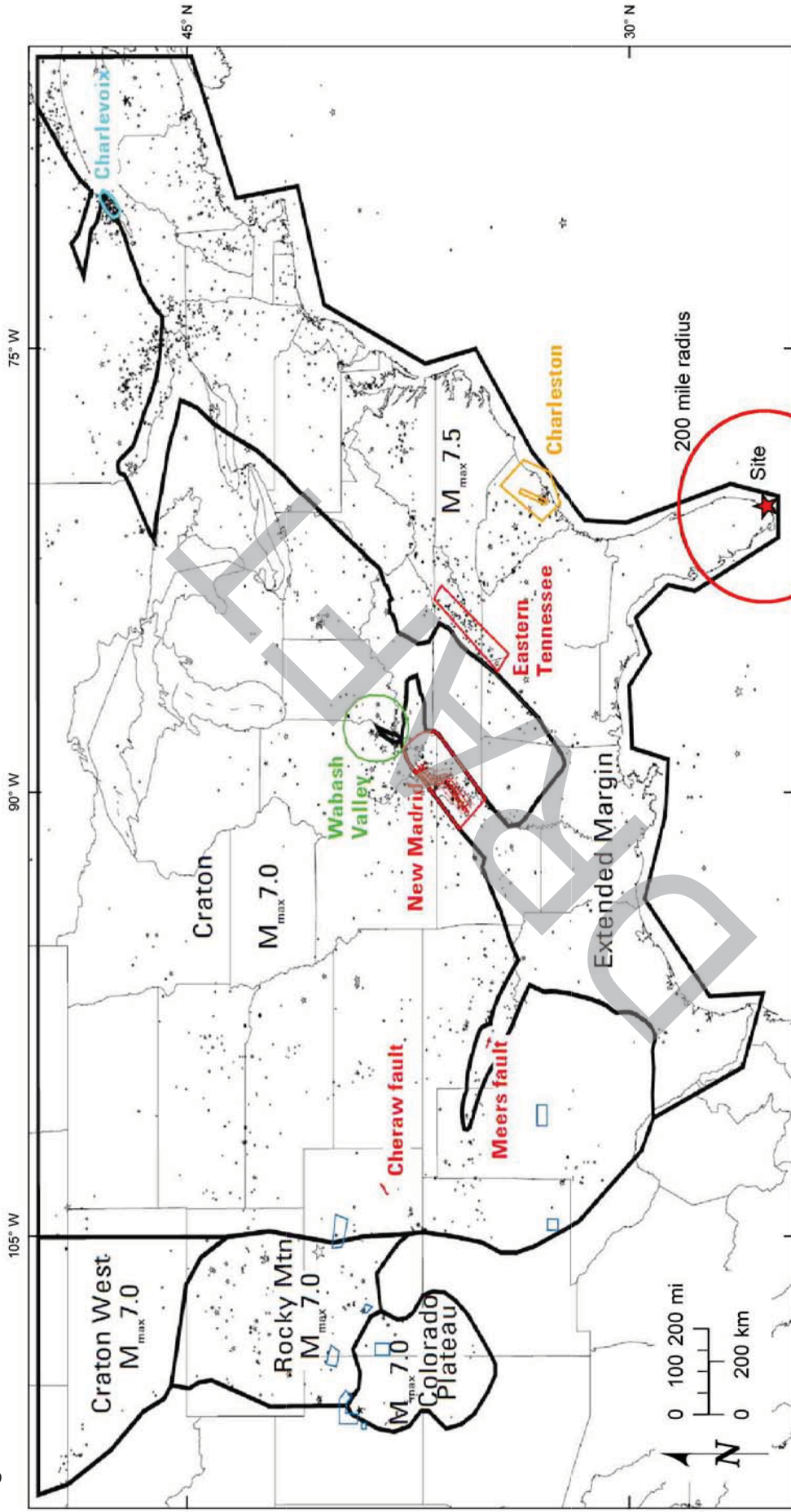
The FSAR does not list the USGS national seismic hazard map project as a potential source for EPRI seismic source model updates. The USGS regularly updates its own national seismic hazard maps using the most recent data and information. Within the last decade, the USGS published two comprehensive national seismic hazard reports in 2002 and 2008. RG 1.208 indicates that existing seismic source models should be evaluated in light of more recent data and evolving knowledge. Please discuss why the USGS national seismic hazard maps and model parameters are not discussed as potential studies to be considered in updating the existing EPRI seismic source geometries and/or model parameters.

**FPL RESPONSE:**

A new discussion of the USGS National Seismic Hazard Mapping Project (NSHMP) will be added to the FSAR. The USGS NSHMP (FSAR Reference 300) characterizes seismic sources throughout the continental United States using multiple classes of earthquake source models. The general approach used by the USGS for modeling distributed seismicity in the Central and Eastern United States (CEUS) is based on gridded, spatially smoothed seismicity in large background zones. Seismic sources within the CEUS most relevant to the Turkey Point Units 6 & 7 site are modeled with: (1) a regional uniform background source model dividing the Extended Margin of the CEUS from the Craton; (2) special zones accounting for variability in catalog completeness, seismicity, maximum magnitude, and b-value, such as the uniform source zones for the Eastern Tennessee and New Madrid seismic zones; and (3) finite fault sources, such as those included for the New Madrid and Charleston seismic sources.

The 2008 NSHMP earthquake sources are depicted in Figure 1. Significant changes from the 2002 NSHMP (FSAR Reference 251) model of seismic hazard in the CEUS include: (1) uncertainty in the maximum magnitude ( $M_{max}$ ) assigned to  $M_{max}$  zones (e.g., Extended Margin); (2) revised geometry of the Charleston seismic source zones; and (3) revised magnitudes, rates, and geometry for the New Madrid seismic source. As a result of these updates, the 2008 NSHMP characterizes  $M_{max}$  for the Extended Margin and Craton as weighted distributions ranging between  $M7.1 - 7.7$  and  $M6.6 - 7.2$ , respectively. The two areal zones defining the Charleston source are both assigned  $M_{max}$  distributions of  $M6.8 - 7.5$  with a recurrence interval of 550 years, unchanged from the 2002 NSHMP (FSAR Reference 251). The Charleston seismic source updates from the NSHMP (FSAR Reference 300) are discussed in Subsections 2.5.2.4.4.2.2 and 2.5.2.4.4.2.3.

The NSHMP model only covers a small portion of the site region (Figure 1) and does not include seismically active areas in the southern part of the site region and beyond, such as Cuba and the North America-Caribbean plate boundary that contribute to the seismic hazard in southern Florida. Therefore, a direct comparison between the NSHMP SSC model and the FSAR SSC model is not presented in the FSAR.



Projection: North American Datum 1983

**Figure 1. Seismic Sources from the U.S. Geological Survey's 2008 National Seismic Hazard Mapping Project**  
(Petersen et al. 2008 FSAR Reference 300)

This response is PLANT SPECIFIC.

**References:**

None

**ASSOCIATED COLA REVISIONS:**

FSAR Subsection 2.5.2.4.4 will be revised in a future COLA revision as follows:

**2.5.2.4.4 New Seismic Source Characterizations**

To complement the updated EPRI seismic source model described above, three new seismic source characterizations are included for analysis. These three new source characterizations are:

- Supplemental seismic source zones that fill the area of the site region beyond the area covered by the original EPRI source model (Subsection 2.5.2.4.4.1).
- New, post-EPRI characterization of the Charleston seismic source (Subsection 2.5.2.4.4.2).
- New, post-EPRI characterization of seismic sources located in the Cuba area and the North America-Caribbean plate boundary region (Subsection 2.5.2.4.4.3).

**An additional post-EPRI model is the USGS National Seismic Hazard Mapping Project (NSHMP) (Reference 300), which characterizes seismic sources throughout the continental United States using multiple classes of earthquake source models. While the NSHMP source model is described below, source parameters from this model are not included in the updated PSHA for the Turkey Point Units 6 & 7 site. The general approach used by the USGS for modeling distributed seismicity in the CEUS is based on gridded, spatially smoothed seismicity in large background zones. Seismic sources within the Central and Eastern United States (CEUS) most relevant to the FPL Turkey Point site are modeled with: (1) a regional uniform background source model dividing the Extended Margin of the CEUS from the Craton; (2) special zones accounting for variability in catalog completeness, seismicity, maximum magnitude, and b-value, such as the uniform source zones for the Eastern Tennessee and New Madrid seismic zones; and (3) finite fault sources, such as those included for the New Madrid and Charleston seismic sources.**

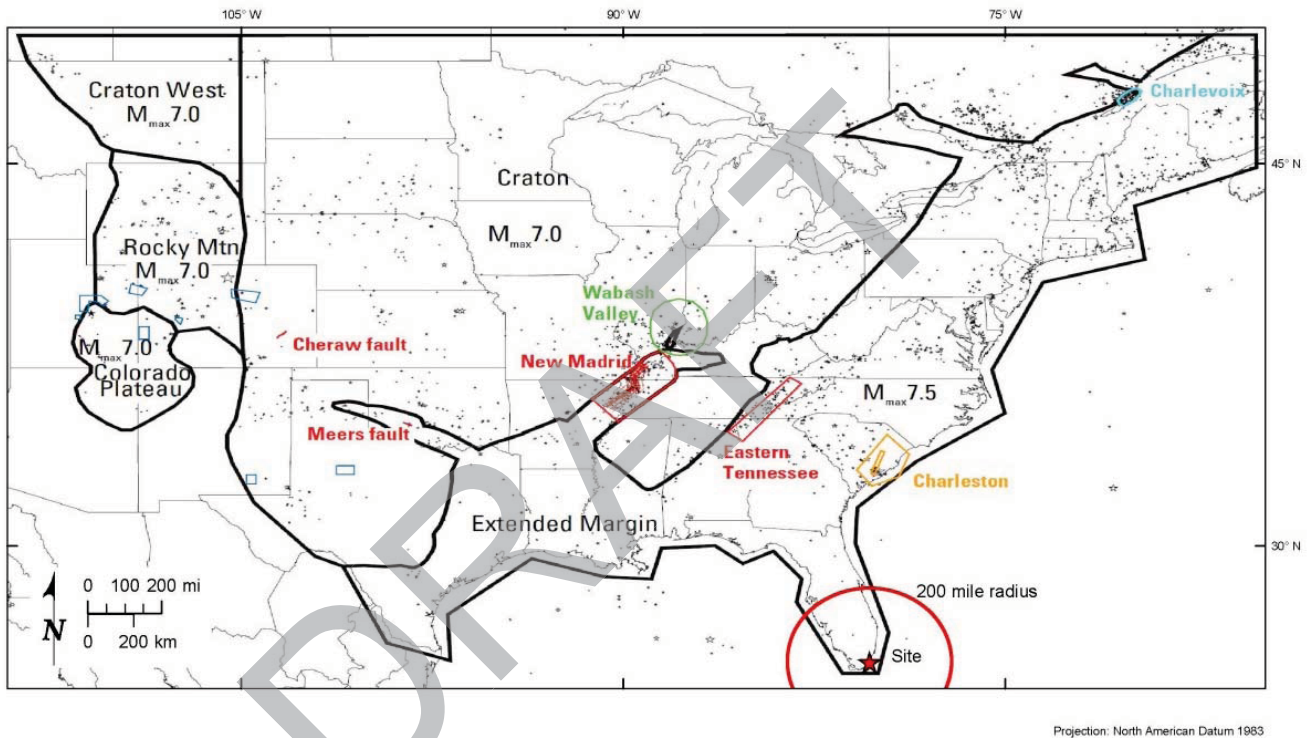
**The 2008 NSHMP earthquake sources are depicted in Figure 2.5.2-258. Significant changes from the 2002 NSHMP model of seismic hazard in the CEUS (Reference 251) include: (1) uncertainty in the maximum magnitude (Mmax) assigned to Mmax zones (e.g., Extended Margin); (2) revised geometry of the Charleston seismic source zones; and (3) revised magnitudes, rates, and geometry for the New Madrid seismic source. As a result of these updates, the 2008 NSHMP characterizes Mmax for the Extended Margin and Craton as weighted distributions ranging between M7.1 - 7.7 and M6.6 - 7.2, respectively. The two areal zones defining the Charleston source are both assigned Mmax distributions of M6.8 - 7.5 with a recurrence interval of 550**

**years, unchanged from the 2002 NSHMP. The USGS NSHMP Charleston seismic source update is discussed in FSAR Subsections 2.5.2.4.4.2.2 and 2.5.2.4.4.2.3.**

#### 2.5.2.4.4.1 Supplemental Source Zones

The following new figure will be included in a future COLA revision.

**Figure 2.5.2-258 USGS National Seismic Hazard Map Earthquake Sources**



**Source: Petersen et al. 2008 FSAR Reference 300**

#### **ASSOCIATED ENCLOSURES:**

None