Henry Jones

From: Eric L. Geist [egeist@usgs.gov]
Sent: Friday, October 03, 2008 7:49 PM
To: Henry Jones
Cc: Jason Chaytor; plynett@tamu.edu
Subject: Re: LEVY INFORMATION NEEDS
Attachments: %LEVY_Info_Needs-Hydro_Safety(USGSdraft).doc; %LEVY_Info_Needs-Hydro_Safety(USGSdraft).pdf; %Levy_InfoNeeds_tsunami(100308eg).pdf

Dear Henry,
Attached please find the information needs table revised to include our group's needs for Section 2.4.6 (additional needs from us indicated in blue). This file is in both MS Word and PDF formats. Also attached is our information needs in a memo, for your reference.
Please let us know if there are any questions regarding this information.
...Eric

I have attached the Information Needs generated so far minus Nebiyu Tiruneh's input for Sections 2.4.2-4 & 2.4.14 (in progress). Please add your Information Needs to the list and return as soon as possible so that I can forward the list to the Safety Program Manager. Thanks.

Henry

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B-17

JCN No. Q-4151
Task Order No. 10
Progress Energy
Levy County COL

Title: Hydrology Section 2.4.6 Information Needs
USGS Draft #: 100308eg

Provided below are draft information needs for the upcoming Levy County Site Safety Audit scheduled for the week of November 3, 2008, with regard to Section 2.4.6 "Probable Maximum Tsunami".

Section 2.4.6.1 (Probable Maximum Tsunami):

PMT Determination

- Provide an SME to discuss the inclusion of text related to the determination of the Probable Maximum Tsunami (according to RG 1.206), including the most reasonably severe geo-seismic event in determining the limiting tsunami-producing mechanism, as well as other discussion elements expected for this section.

Section 2.4.6.2 (Historical Tsunami Record):

Impact of Caribbean Tsunamis on the Gulf Coast

- Provide an SME to discuss the discrepancy between the statement that "...historically no Caribbean tsunami has impacted the United States Gulf Coast" (2.4.6.2.2, pg. 2.4-45) and the description of such events in the next section (2.4.6.2.3) and elsewhere in the report.

Maximum Water Height Measurements

- Provide an SME to discuss the location of Maximum Water Height measurements relative to the tsunami generator for the events listed in Table 2.4.6—202.

Tsunami deposits

- Provide an SME to discuss the potential for tsunami deposits at the Levy County site or nearby regions and how they would be distinguished from storm washover deposits. Are there geologically conducive locations for the deposition and preservation of tsunami deposits at the Levy County site or nearby regions?

Section 2.4.6.3 (Tsunami Source Generator Characteristics):

Central and Eastern Gulf of Mexico Submarine Landslides

- Provide an SME to discuss submarine landslides in the Gulf of Mexico, other than East Breaks, as potential tsunami generators, including the Mississippi Canyon landslide, and landslides along the Florida Escarpment and along the slope above the Florida Escarpment.

East Breaks Submarine Landslide (NW Gulf of Mexico)

- Provide an SME to discuss the justification for apparent exclusion of the East Breaks landslide as a potential tsunami source generator (cf., pg. 2.4-58).

Veracruz Earthquake Scenario

- Provide an SME to discuss evidence for historic seismicity in the region of the Veracruz, Mexico earthquake scenario as stated in the report (pg 2.4-57).

Section 2.4.6.4 (Tsunami Analysis):

Tsunami Attenuation Function

- Provide an SME to discuss the theoretical basis, assumptions (e.g., source parameterization), and applicability to the Levy County site for the tsunami attenuation function discussed on pg. 2.4-53 (Equation 2.4.6-1). Also provide details of the Monte Carlo analysis used to estimate the maximum wave height and where the maximum wave height estimate is geographically located.

Gulf of Mexico Earthquake

- Provide an SME to discuss the inconsistency of the statement that the Gulf of Mexico contains no sources of reverse faults (1st sentence, section 2.4.6.4.1.2, pg. 2.4-52) given the mechanism of the September 10, 2006 Mw=5.8 in the NE Gulf of Mexico (third sentence).

Section 2.4.6.5 (Tsunami Water Levels):

Site-Specific Tsunami Runup

- Provide an SME to discuss the procedure for calculating tsunami propagation, runup, and inundation (i.e., tsunami water levels) at the Levy County site from offshore tsunami amplitude.

PMT Source

- Provide an SME to clarify the source of the PMT for the Levy County site. Is it the East Breaks landslide with an estimated 1.68 m maximum wave height (pg. 2.4-53), the Venezuela earthquake with an estimated 1.95 m maximum runup height (pg. 2.4-58)?

10% exceedance high tide

- Provide an SME to discuss the value for 10% exceedance high-tide coincident with maximum tsunami water levels at the Levy County site.

Sea-level rise

- Provide an SME to discuss long-term sea-level rise coincident with maximum tsunami water levels at the Levy County site.

Section 2.4.6.6 (Hydrography and Harbor or Breakwater Influences on Tsunami

- No information needs

Levy County Nuclear Plant

Information Needs for Hydrology Safety Audit - November 03-07, 2008

Serial #	FSAR Section	Discipline	Information Needs	Reviewer
1	General	Surface Water Hydrology	Provide a subject matter expert (SME) to discuss the availability of the input/output files associated with the HEC-HMS and HEC-RAS model simulations.	H. Jones
2	General	Surface Water Hydrology	Please provide an SME to discuss the vertical units and contour interval used on topographic maps (e.g. 2.4.1-203, -204, and -205).	M. McBride
3	2.4.5	Storm Surge and Seiche	Provide an SME to discuss the estimation of storm surge under probable maximum hurricane conditions.	H. Jones
4	2.4.5.2.6	Storm Surge and Seiche	Provide an SME to discuss seismically/atmospheric-induced seiches in Lake Rousseau.	H. Jones
5	2.4.5.3.1	Storm Surge and Seiche	Provide an SME to discuss the estimation of the limiting wave period.	H. Jones
6	2.4.5.4	Storm Surge and Seiche	Provide a SME to discuss the approach in determining the possibility of resonance in Lake Rousseau.	H. Jones
7	2.4.5	Storm Surge and Seiche	Provide a SME to discuss the availability of the input/output files used during simulation of the hurricane scenarios with the Hsu model.	H. Jones
8	2.4.5	Storm Surge and Seiche	Provide a SME to discuss the availability of the SLOSH input/output files used to compute the maximum storm surge heights.	H. Jones
9	2.4.5	Storm Surge and Seiche	Provide a SME to discuss any effort made to adjust PMH parameters in light of more recent hurricanes that have occurred since (30 years) the NOAA NWS charts were published.	H. Jones
10	2.4.5	Storm Surge and Seiche	Provide a SME to discuss any effort made to adjust long-term sea level rises due to climate change in addition to trends reported in gulf of Mexico based on recorded tidal levels at various NOAA tide gauges.	H. Jones
11	2.4.6	Tsunami Hazards	Provide a SME to discuss the availability of the geological maps, topographic maps, and Levy county site reconnaissance data used in the assessment of potential subaerial landslides near the site.	H. Jones
12	2.4.6	Tsunami Hazards	Provide an SME to discuss the findings regarding potential hill-slope failure and the findings in Section 2.5 of the FSAR.	H. Jones

	2.4.6.1	Tsunami Hazards	Provide an SME to discuss the inclusion of text related to the determination of the Probable Maximum Tsunami (according to RG 1.206), including the most reasonably severe geo-seismic event in determining the limiting tsunami-producing mechanism, as well as other discussion elements expected for this section.	E. Geist
	2.4.6.2	Tsunami Hazards	Provide an SME to discuss the discrepancy between the statement that "…historically no Caribbean tsunami has impacted the United States Gulf Coast" (2.4.6.2.2, pg. 2.4-45) and the description of such events in the next section (2.4.6.2.3) and elsewhere in the report.	E. Geist
	2.4.6.2	Tsunami Hazards	Provide an SME to discuss the location of Maximum Water Height measurements relative to the tsunami generator for the events listed in Table 2.4.6—202.	E. Geist
	2.4.6.2	Tsunami Hazards	Provide an SME to discuss the potential for tsunami deposits at the Levy County site or nearby regions and how they would be distinguished from storm washover deposits. Are there geologically conducive locations for the deposition and preservation of tsunami deposits at the Levy County site or nearby regions?	J. Chaytor
	2.4.6.3	Tsunami Hazards	Provide an SME to discuss submarine landslides in the Gulf of Mexico, other than East Breaks, as potential tsunami generators, including the Mississippi Canyon landslide, and landslides along the Florida Escarpment and along the slope above the Florida Escarpment.	J. Chaytor
	2.4.6.3	Tsunami Hazards	Provide an SME to discuss the justification for apparent exclusion of the East Breaks landslide as a potential tsunami source generator (cf., pg. 2.4-58).	J. Chaytor
	2.4.6.3	Tsunami Hazards	Provide an SME to discuss evidence for historic seismicity in the region of the Veracruz, Mexico earthquake scenario as stated in the report (pg 2.4-57).	E. Geist
	2.4.6.4	Tsunami Hazards	Provide an SME to discuss the theoretical basis, assumptions (e.g., source parameterization), and applicability to the Levy County site for the tsunami attenuation function discussed on pg. 2.4-53 (Equation 2.4.6-1). Also provide details of the Monte Carlo analysis used to estimate the maximum wave height and where the maximum wave height estimate is geographically located.	P. Lynett
	2.4.6.4	Tsunami Hazards	Provide an SME to discuss the inconsistency of the statement that the Gulf of Mexico contains no sources of reverse faults (1st sentence, section 2.4.6.4.1.2, pg. 2.4-52) given the mechanism of the September 10, 2006 Mw=5.8 in the NE Gulf of Mexico (third sentence).	E. Geist

	2.4.6.5	Tsunami Hazards	Provide an SME to discuss the procedure for calculating tsunami propagation, runup, and inundation (i.e., tsunami water levels) at the Levy County site from offshore tsunami amplitude.	P. Lynett
	2.4.6.5	Tsunami Hazards	Provide an SME to clarify the source of the PMT for the Levy County site. Is it the East Breaks landslide with an estimated 1.68 m maximum wave height (pg. 2.4-53), the Venezuela earthquake with an estimated 1.95 m maximum runup height (pg. 2.4-58)?	E. Geist
	2.4.6.5	Tsunami Hazards	Provide an SME to discuss the value for 10% exceedance high-tide coincident with maximum tsunami water levels at the Levy County site.	E. Geist
	2.4.6.5	Tsunami Hazards	Provide an SME to discuss long-term sea-level rise coincident with maximum tsunami water levels at the Levy County site.	E. Geist
13	2.4.12.1.2	Groundwater Hydrology	Please provide an SME to discuss groundwater chemistry at the site. (Water quality is described as "good" for potable water on p. 2.4-68.)	M. McBride
14	2.4.12.1.3	Groundwater Hydrology	Please provide an SME to discuss why water supply wells will be spaced at least 750 ft apart (p. 2.4-69, first paragraph).	M. McBride
15	2.4.12.2.1	Groundwater Hydrology	Well permit records were obtained from SRWMD covering a period of about 32 years (1976-2007) and from SWFWMD for about 38 years (1970-2007). However, Figures 2.4.12-206 to 2.4.12-210 show a much smaller density of wells in the area within the SRWMD. Please provide an SME to discuss the reasons for this difference in well density.	M. McBride
16	2.4.12.2.2	Groundwater Hydrology	Please provide an SME to discuss boring logs for the piezometers and monitoring wells listed in Table 2.4.12-207.	M. McBride
17	2.4.12.2.2	Groundwater Hydrology	Please provide an SME to discuss whether the topographic high of approximately 60 ft is located in the western portion of the LNP site as stated (p. 2.4-72, last paragraph, 6th line), or is east of the LNP site (and outside the site boundary) as suggested by Figure 2.4.1-203.	M. McBride
18	2.4.12.2.2	Groundwater Hydrology	Please provide an SME to discuss possible locations where groundwater flowing near the site may discharge, and how these discharges may, in part, control the direction of groundwater flow to the west-southwest. To judge from Figure 2.4.1-206, such locations could include Spring Run, northwest of the site; the marshes south of Spring Run; and the Withlacoochee River, to the south.	M. McBride

19	2.4.12.2.2	Groundwater Hydrology	Vertical gradients (Table 2.4.12-209) are calculated using five different combinations of the top, bottom, and midpoint of the pair of screens. Please provide an SME to discuss (1) which of these calculated gradients is most relevant to evaluating groundwater conditions at the site, and (2) whether presenting more than one calculated gradient is meaningful.	M. McBride
20	2.4.12.2.2	Groundwater Hydrology	Please provide an SME to discuss the interpretation of vertical groundwater gradients, with particular reference to (1) p. 2.4-73, which states that the LNP site is "in a transitional area between upward and downward vertical gradients" on account of the low magnitudes of the vertical gradients, and (2) Table 2.4.12-209, in which the gradients are without exception downward.	M. McBride
21	2.4.12.2.3	Groundwater Hydrology	Please provide an SME to discuss whether any spatial trend or regularities are evident in the hydraulic conductivities measured by the slug tests. Please have available a map showing the hydraulic conductivities plotted by slug test location to assist with this discussion.	M. McBride
22	2.4.12.2.3	Groundwater Hydrology	Please provide an SME to discuss the how the pumping test was conducted and analyzed, including discussion of plots of drawdown against time.	M. McBride
23	2.4.12.2.3	Groundwater Hydrology	Transmissivities were calculated from the pumping test based on the vertical distance from the bottom of the well screen to the water table, rather than on the full thickness of the aquifer. The pumping test was therefore partially penetrating. Please provide an SME to discuss corrections that were made for partial penetration in the analysis of the pumping test.	M. McBride
24	2.4.12.2.3	Groundwater Hydrology	The pumping test was conducted in the surficial aquifer, which immediately overlies the Avon Park formation. Therefore the usual assumption that the aquifer is bounded below by an impermeable layer is invalid. Please provide an SME to discuss how was this circumstance accounted for in the analysis of the pumping test.	M. McBride
25	2.4.12.2.3	Groundwater Hydrology	Please provide an SME to discuss the hydraulic conductivities that correspond to the transmissivities reported in Table 2.4.12-211.	M. McBride

26	2.4.12.2.4	Groundwater Hydrology	The SWFWMD estimated that, in 2005, a total of 7.677 mgd of water was used within its portion of Levy County. The LNP would use between 1.269 mgd and 5.848 mgd (from 17% to 76% of this total), and this pumping would be concentrated in a small area. Please provide an SME to discuss the potential effects of this pumping on groundwater levels, surface water, and other water users in the affected area.	M. McBride
27	2.4.12.2.4	Groundwater Hydrology	Please provide an SME to discuss why dewatering for excavation is expected to have minimal effects on groundwater.	M. McBride
28	2.4.12.4	Groundwater Hydrology	Please provide an SME to discuss substantive content of the four monitoring programs identified here. Possible subjects for discussion include possible locations for monitoring wells and surface water sampling points, field measurements during sampling, sample analytes, sampling schedule, and how results will be interpreted.	M. McBride
29	2.4.13.2	Accidental Releases	Please provide an SME to discuss the total thickness of the Floridan Aquifer (and in particular the Upper Floridan) at the site. The thickness of the Floridan Aquifer is described as being more than 250 ft on p. 2.4-79, 3rd paragraph. However, Figure 2.5.1-250 shows a thickness of more than 345 ft for the Avon Park Formation alone.	M. McBride
30	2.4.13.2	Accidental Releases	Please provide an SME to discuss why assuming a release to the top of the Floridan Aquifer is conservative (p. 2.4-79, 5th paragraph). In particular, we would like to discuss whether a release to the surficial aquifer could discharge to surface water, including marshes or ditches at LNP, closer than the nearest well, which the analysis assumes to be the nearest point of exposure.	M. McBride
31	2.4.13.2.1	Accidental Releases	Please provide an SME to discuss the software used to evaluate the model described in this section, and in particular the validation and verification of this software.	M. McBride
32	2.4.13.2.1	Accidental Releases	Please provide an SME to discuss the sources of the model parameters listed in Table 2.4.13-203.	M. McBride
33	2.4.13.2.1	Accidental Releases	Please provide an SME to discuss (1) the flow paths that are assumed in this discussion of radionuclide transport and (2) the shape and extent of the calculated radionuclide plume resulting from the transport processes.	M. McBride

34	2.4.13.2.2	Accidental Releases	Please provide an SME to discuss how arrival times for the surficial aquifer shown in Table 2.4.13-203 were calculated, given that the radionuclide release was assumed to occur at the top of the Floridan Aquifer rather than in the surficial aquifer.	M. McBride
35	2.4.13.2.2	Accidental Releases	p. 2.4-83, 1st paragraph: Please provide an SME to discuss the variation in radionuclide concentrations with time at the Withlacoochee River and the location of the nearest resident, and in particular the time at which the first detectable concentrations of radionuclides are modeled as reaching these locations.	M. McBride
36	2.4.13.2.3	Accidental Releases	Please provide an SME to discuss the dilution factors and activity concentrations in the Lower Withlacoochee River shown in Table 2.4.13-204, in particular whether the values represent groundwater near the river or whether they include dilution in the river.	M. McBride