

RAS 12232

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD

DOCKETED 09/13/06

SERVED 09/13/06

Before Administrative Judges:

Lawrence G. McDade, Chairman
Nicholas G. Trikouros
Dr. Richard E. Wardwell

In the Matter of

SYSTEM ENERGY RESOURCES, INC.

(Early Site Permit for Grand Gulf ESP Site)

Docket No. 52-009-ESP

ASLBP No. 04-823-03-ESP

September 13, 2006

ORDER

(Issuing Questions Relating to the Grand Gulf
Early Site Permit Safety Evaluation Report)

On August 1, 2006, this Board issued a Scheduling Order in which we stated that, on or about September 13, 2006, we would issue written questions to the NRC Staff relating to the Grand Gulf Early Site Permit (ESP) Safety Evaluation Report (SER). Having completed our preliminary review of the Grand Gulf SER, the Board now propounds to the NRC Staff the questions set forth in Attachment A hereto.

The Staff shall file its responses to the questions in Attachment A not later than 5:00 P.M. E.S.T. on Friday, September 29, 2006. The Board will furnish an electronic copy of Attachment A to the parties when this Order is entered. In responding to the Board's questions the NRC Staff should, to the degree practicable, input its answers into the electronic copy of Attachment A immediately after the question propounded by the Board.

If the Staff concludes that it will need additional time to respond to the Board's questions, it should submit a Motion for an Extension of Time on or before September 25, 2006. Likewise, if the Staff desires clarification of any question, it should file a Motion for Clarification on or before September 25, 2006.

The Applicant, System Energy Resources, Inc. (SERI), may file comments on the NRC Staff's answers to the Board's questions within seven (7) days after receipt of the NRC Staff's answers. To facilitate a prompt reply, the NRC Staff shall serve an electronic copy of its answers on SERI at the same time that they are filed with the Board. SERI shall, again to the degree practicable, input its comments into that electronic document immediately after each Board question and NRC Staff answer.

IT IS SO ORDERED.

THE ATOMIC SAFETY
AND LICENSING BOARD¹

/RA/

Lawrence G. McDade, Chairman
ADMINISTRATIVE JUDGE

/RA/

Nicholas G. Trikouros
ADMINISTRATIVE JUDGE

/RA/

Dr. Richard E. Wardwell
ADMINISTRATIVE JUDGE

Rockville, Maryland
September 13, 2006

¹ Copies of this Order were sent this date by Internet e-mail transmission to: (1) Counsel for the NRC Staff and (2) Counsel for SERI.

ATTACHMENT A

Grand Gulf ESP SER Inquiries

Inquiry No.	SER Page	SER Section	Inquiry
1	General	General	The requirements of 10 C.F.R. § 52.17a(1)(i) indicate that the number of facilities should be specified. The ESP application documents do not provide a specific number of facilities to be built. Why did the Staff not require the Applicant to include a specific number?
2	General	General	In order to determine site acceptability, shouldn't the normal effluent evaluations (<u>see, e.g.</u> SER §§ 1-3) consider the combined effluents of all plants at the Grand Gulf site – <u>i.e.</u> existing and new facilities? If no, why not?
3	General	General	For each of the computer code analyses performed in support of the application, please provide the following information: (A) Name of code (B) Revision Number (C) Purpose for which it was used in ESP application (D) Extent of the Staff's review of the code (E) Extent of the Staff's review of input/output (F) Any confirmatory analyses performed by the Staff (G) Review results and any review documentation produced by the Staff.
4	General	General	Please provide a copy of Appendix A to the draft SSAR, "Characteristics of Bluff Height".
5	General	General	The DCDs for plants such as the AP1000 and the ESBWR include specific COL requirements. (A) Have these been reviewed and incorporated into the Grand Gulf SER where appropriate? (B) Have appropriate COL Action Items been developed to accommodate these plant-specific COL requirements?

Inquiry No.	SER Page	SER Section	Inquiry
6	General	General	<p>Many items were deferred from the ESP stage with a commitment to perform/address the issue at the COL stage. Please address the following:</p> <p>(A) With regards to draft SER open items:</p> <p>(1) Please discuss how the open items were tracked to assured that they were resolved.</p> <p>(2) Summarize any remaining open items, and highlight if these are now COL Action Items and if not, explain why not.</p> <p>(B) Some items deferred to the COL stage were listed as COL Action Items, others were simply noted as future commitments, while others were made into Permit Conditions.</p> <p>(1) Is there a comprehensive list of all commitments made by the Applicant and/or issues stated by the Staff in their review that were deferred from the ESP stage and are to be addressed during the COL stage (that are not already denoted as COL Action Items)? If not, please provide one.</p> <p>(2) What are the criteria for determining whether to list a commitment as a Permit Condition, a COL Action Item, or just a deferred COL item?</p> <p>(3) How are deferred commitments that are not listed as COL Action Items documented at this stage (so as to ensure fulfillment at the COL stage), and how will they be documented as complete during the COL stage?</p> <p>(C) The SER states (p. 1-8) that the “list of COL action items is not and should not be considered exhaustive.” What are the implications of this for a COL application which references the ESP? Also, are all COL action items listed in Appendix A and if not, where are they recorded?</p>
7	General	General	<p>The SER states (<u>see, e.g.</u> p. 1-5, 2-41) that the Staff reviewed the Applicant’s PPE values and found that they were not unreasonable. Please explain in more detail the extent and basis of your review.</p>

Inquiry No.	SER Page	SER Section	Inquiry
8	SSAR Table 1.3-1	-----	<p>The PPE (SSAR Table 1.3-1) identifies 4300 MWt as the maximum plant size, based on 3926 MWt with a 10% uprate.</p> <p>(A) How is this value utilized with respect to the number of plants to be built? What is the significance of this number?</p> <p>(B) The ESBWR is identified in its DCD as being 4500 MWt. What are the implications of this since the ESBWR is on the list of possible plants for this site?</p> <p>(C) The SSAR goes on to say that the reactor power goal is 2000 MWe. Does this value include the existing plant and is this reflected anywhere in the PPE?</p>
9	iii	Abstract	<p>The SER indicates that a total of 8600 MWt is acceptable for the site with a max unit size of 4300 MWt.</p> <p>(A) What is the basis for the 8600 MWt since it is not supported in the application?</p> <p>(B) Does this mean that multiple units can be built as long as the maximum per unit is less than 4300 MWt and the site total is less than 8600 MWt, or is it controlled by the 2000 MWe power goal?</p>
10	xiv	Exec. Summary	<p>The SER states that “This SER identifies applicable inspection reports as reference documents.” However, these documents do not seem to be provided as references.</p> <p>Please explain this omission and provide the references for these inspection documents.</p>
11	2-3	2.1.2	<p>In regards to exclusion area authority and control, the SER states that SERI owns the surface rights, yet they have authorized Entergy to maintain control of ingress and egress.</p> <p>Explain further how this interaction will work: will there be any logistic problems between the two responsible parties during emergency operations?</p>
12	2-3	2.1.3	<p>The SER states that the Applicant did not identify any physical characteristics unique to the proposed ESP site that could pose a significant impediment to the development of emergency plans.</p> <p>Explain how the Staff verified the accuracy of and evaluated this representation.</p>

Inquiry No.	SER Page	SER Section	Inquiry
13	2-4	2.1.2.1	<p>The Applicant stated that arrangements would be made for the exercise of authority over the area within the exclusion area for the new facility on the site property but that such arrangements would be made in association with the COL application.</p> <p>(A) Explain the Staff's analysis of how this provides reasonable assurance that the Applicant will have the required control.</p> <p>(B) How is this commitment documented to insure that it will be addressed at the COL stage?</p>
14	2-18	2.2.3.1	<p>The Applicant stated that it will develop appropriate procedures to ensure safe shutdown in the event that raw water makeup is unavailable. Why is this not a Permit Condition or a COL Action Item?</p>
15	2-19	2.2.3.3	<p>Please clarify how the additional analyses performed by the Applicant converted the peak pressure of 4 psi (which exceeded the acceptance criteria) to an acceptable value of 1 psi.</p>
16	2-19	2.2.3.3	<p>The SER states that "Section 2.2.1–2.2.2 of this SER describes potential hazards that might be identified in the future in association with a currently vacant industrial development in Claiborne County Port, just south-west of the ESP site." This potential hazards evaluation could not be found in the SER. Please indicate where it can be found or provide a copy of the evaluation.</p>
17	General	2.3.1.3; 2.3.2	<p>If the Staff were to evaluate all of the meteorological data, hurricane frequencies, etc. (<u>see, e.g.</u> SER pp. 2-33, 2-41), in terms of periodic increments, would it show a trend with the more recent years being more severe? Would this be indicative of climate change effects?</p>
18	2-37	2.3.1.3	<p>The Staff includes in its proposed regional climatology site characteristics (<u>see</u> Table 2.3.1-7) a recommendation to combine the 100-year snowpack with the 48-hour PMWP for roof loads.</p> <p>How will this recommendation be incorporated into the ESP license?</p>
19	2-54	2.3.4.1	<p>What PPE parameters were used in the PAVAN model in order to estimate X/Q at the EAB and LPZ?</p>

Inquiry No.	SER Page	SER Section	Inquiry
20	General	2.4.1	<p>The maximum makeup water flow rate is identified in SER § 2.4.1 (p. 2-68) and in Appendix A-4 (p. A-18) as 78,000 gpm. SSAR Table 1.3-1 also identifies 78,000 gpm as the max makeup flow rate. This is inconsistent with COL Action Item 2.4-4 (p. A-5), which indicates a maximum makeup water flow rate of 85,000 gpm.</p> <p>(A) Please provide an explanation.</p> <p>(B) Does the 78,000 gpm meet the needs of the 2000 MWe power goal?</p>
21	2-67	2.4.1.1	<p>The SER states that “[a]dditional assessment to define the location and extent of perched aquifers would be conducted at the COL stage.”</p> <p>(A) How are these additional studies going to be reflected in the ESP?</p> <p>(B) Why is this not a COL Action Item?</p> <p>(C) How will this commitment be documented to insure that it will be dealt with at the COL stage?</p>
22	2-76	2.4.1.3	<p>The SER states that a detailed ground water monitoring program will be developed at the COL stage.</p> <p>(A) Why is this not a COL Action Item?</p> <p>(B) Is there a reason why Permit Condition 2.4-1 (relating to preclusion of accidental release from waste treatment storage facilities) is not included in Appendix A.1 of the SER?</p>
23	2-115	2.4.8.3	<p>Given that the SER does not include the UHS design data referenced in this section, please explain how the maximum makeup flow rate identified in COL Action Item 2.4-4 (p. 2-80) was determined?</p>
24	2-115 to 2-116	2.4.8.3	<p>The SER’s use of the word “frequently” with respect to the ESP facility’s use of the UHS is not very precise (e.g. “The COL applicant must demonstrate that the UHS is not used <u>frequently</u> for non-emergency use.”).</p> <p>(A) What does “frequently” mean with respect to the use of the UHS for non-emergency purposes?</p> <p>(B) Shouldn’t this be specified more precisely as part of the UHS design basis?</p>
25	2-124	2.4.11.2	<p>The SER states that the design basis should identify and take into account the most adverse possible effects of these controls to ensure that essential water supplies are not likely to be negatively affected in the future.</p> <p>Why is this not a COL Action Item?</p>

Inquiry No.	SER Page	SER Section	Inquiry
26	2-127	2.4.12.1	What information did the Applicant use to select the reported hydraulic conductivities of the alluvium, terrace deposits, and Catahoula Formation?
27	2-127	2.4.12.1	The SER reports the Applicant's estimate that a maximum of 3570 gpm of groundwater would be needed during routine operations. What explorations and testing were performed to define the aquifer water limits and verify its yield to assure that the site could provide this flow without affecting either aquifer quality, the existing plant's needs, or the structural integrity of the buildings?
28	2-131	2.4.12.3	It appears that little, if any, aquifer testing has been done to determine the transmissivity of the geologic strata (<u>e.g.</u> K, T of loess, terrace alluvium) at the site. Is there a reason why these fundamental site characteristics have not been determined to date, considering their direct application to the ESP stage?
29	2-131	2.4.12.3	What is the degree of saturation in the loess and what is the potential for perched zones to exist that might provide this necessary condition for liquefaction?
30	2-132 to 2-140	2.4.13	How will potential impacts from the new plant be separated from any existing impacts or future releases from the existing plant?
31	2-135	2.4.13.3	What is the difference between retention and retardation and how do the modeling coefficients for these parameters differ?
32	2-137	2.4.13.3	What is the difference between absorption and retention and how do the modeling coefficients for these parameters differ?
33	2-138	2.4.13.3	It is stated that the K_d values for Cs-137 and Sr-90 used in the ESP application "were established for site-specific calculations in the GGNS Unit 1 UFSAR." How were these coefficients established?

Inquiry No.	SER Page	SER Section	Inquiry
34	2-138	2.4.13.3	<p>The second table on page 2-138 shows values for terrace formation. It is not clear why there would be values for a geologic feature rather than for the material of which it is comprised (<u>e.g.</u> alluvium).</p> <p>(A) What material comprises these features and how does it differ from the two layers of alluvium for the Upland Complex?</p> <p>(B) Why is it not covered by either the clay-silt alluvium or the alluvium aquifer?</p>
35	General	2.4.14	<p>Is there any reason that SRP § 2.4.14, “Technical Specifications & Emergency Operation Requirements,” was not addressed in the SER? And, why was the name changed to “Site Characteristics Related to Hydrology”?</p>
36	General	2.5.1	<p>There appear to be some inconsistencies when discussing the geologic strata at the site:</p> <p>(A) Some sections mention that the plant will be founded on the Catahoula Formation and other sections mention the Upland Complex. Which is it?</p> <p>(B) There are various representations of geologic strata beneath the site (<u>e.g.</u> description on page 2-161, 2-196-97; SSAR Figures 2.4-37, 2.5-76). Please discuss:</p> <p>(1) The discrepancies between these representations and describe further the relationship between terrace deposits and the Upland Complex.</p> <p>(2) The difference between the “Old Alluvium” and “New Alluvium” and verify that they both are part of the Upland Complex.</p>
37	2-176	2.5.2.1.3	<p>The shallow profile for ground motion consists of “75 feet of loess” on top of “85 feet of young Alluvium” on top of “40 feet of old Alluvium,” on top of “25 feet of Catahoula Formation”.</p> <p>Verify that the “young” and old Alluvium layers are of the Upland Complex?</p>
38	2-186 to 2-187	2.5.2.3.2	<p>The final sentence on page 2-187 states that “this open item is resolved,” presumably referring to RAI 2.5-9. Briefly explain what “open item” this is referring to.</p>
39	2-190	2.5.3.1.1	<p>What specific data (including spacing of exploration borings) were used in the previous investigations for the existing site to illustrate that the buried stratigraphic layers across the site were not deformed by faulting, folding, or tilting?</p>

Inquiry No.	SER Page	SER Section	Inquiry
40	2-190	2.5.3.1.1	What, if any, analyses were performed to help assure that the spacing of geologic information was sufficiently small enough to allow the Applicant to differentiate between eroded surface and a deformed surface?
41	2-192	2.5.3.1.1	What was the spacing of the borings along the Mississippi River that allowed USACE to conclude that the Quaternary deposits are not faulted?
42	General	2.5.4.1	<p>Statements are made (<u>see, e.g.</u> pp. 2-204, 2-227, 2-228, 2-240; SSAR at 2.5-80, 2.5-83) that geologic deposits (<u>i.e.</u> Catahoula Formation, Upland Complex of old Alluvium and new Alluvium, and loess) appear to be over-consolidated. This is the basis for assuming that the Ko for each strata should approach (and possibly exceed) 1.0. Likewise, on page 2-227, the SER notes that the Applicant concluded that the susceptibility of soil deposits to liquefaction is low (citing SSAR § 2.5.4.4).</p> <p>(A) What is the basis for saying that these strata are overconsolidated (<u>e.g.</u> field &/or laboratory tests)?</p> <p>(B) What is the resulting overconsolidation ratio?</p> <p>(C) What are the geologic mechanisms that might have caused this overconsolidation in the loess and Upland Complex/Old Alluvium and what is the evidence of this continuing to occur at the site?</p> <p>(D) How were the relative densities of loess calculated from the dry densities?</p> <p>(E) Were any moisture-density or max/min density tests performed to determine maximum density and relative potential for liquefaction?</p> <p>(F) What affect would a different interpretation (<u>i.e.</u> normally consolidated) have on the dynamic loading responses and liquefaction potential?</p> <p>(G) How does age of loess affect the resistance to liquefaction given its low density as reflected by the SPT?</p> <p>(H) If only the curve fitting to the EPRI modulus reduction and damping characteristics are used to support this supposition, elaborate more on this analysis (<u>e.g.</u> background for development of the EPRI curves; similarities of modeled soil to site geology for the application of predicting OCR; historical use of these curves to predict overconsolidation; sensitivity of the results to variations in interpretation; sample disturbance; etc.).</p>

Inquiry No.	SER Page	SER Section	Inquiry
43	2-195	2.5.4.1.1	<p>In regards to the stratification:</p> <p>(A) How was Su of the loess derived from SPT as reported in the SSAR page 2.5-77?</p> <p>(B) What is the relationship between the new term “Upland Alluvium” to the Upland Complex?</p>
44	2-196	2.5.4.1.1	<p>The SER notes that the Applicant will take additional borings in the fill area as part of the COL. Likewise, SSAR § 2.5.4.1 states that additional site exploration, laboratory testing, and geotechnical analyses will be performed for the COL.</p> <p>(A) Where will this commitment be reflected in the ESP license?</p> <p>(B) What QA/QC procedures have been developed to assure that the Staff will verify that this will be accomplished during the COL stage?</p>
45	2-196	2.5.4.1.1	<p>The SER references Figure 2.5.4-18 (SSAR Figure 2.5.4-60). The figure cannot be located (it is not listed in the list of Figures).</p> <p>Please indicate where in the submitted documentation it can be found, or provide a hard copy.</p>
46	2-196	2.5.4.1.1	<p>The SER states: “In its response, the applicant stated that Figure 2.5.4-18 (SSAR Figure 2.5.4-60) shows the BE profile which is based on a visual average of the three compression and shear (P-S) suspension log surveys obtained from the ESP site borings.”</p> <p>What does the phrase “visual average of the three” surveys mean?</p>
47	2-196	2.5.4.1.1	<p>What geotechnical information is available to define the properties of the in-situ fill, and is there certainty that differential settlement associated with the transition from native geology to fill will not cause unacceptable differential settlements?</p>
48	2-200	2.5.4.1.1	<p>The SER states that the “applicant will further verify the site stratigraphy by additional borings taken during the COL phase.”</p> <p>Where do you propose to document this commitment?</p>

Inquiry No.	SER Page	SER Section	Inquiry
49	2-202	2.5.4.1.1	<p>SSAR § 2.5.4.1.6 (pp. 2.5-80 to -81), lists average moisture content for loess as 22.8%, and for the Upland Alluvium as 19.2%. The fourth paragraph on page 2-202, however, lists these averages as 22% for loess and 68% for Upland Alluvium.</p> <p>(A) Please explain this discrepancy.</p> <p>(B) Given the average moisture contents of 22.8% and 19.2%, what is the approximate percentage saturation for these zones?</p>
50	2-227	2.5.4.1.3	<p>Of what relevance does the discussion on the potential for karstic features have on the site response of soil to dynamic loading?</p>
51	2-229	2.5.4.1.5	<p>According to the SER, SSAR § 2.5.4.5 states that the new facilities will be founded on the Upland Alluvium, but also states that they will be founded upon soils that will have a V_s of 1000 fps or greater.</p> <p>(A) How will the verification of this parameter be achieved for design and construction?</p> <p>(B) How does Table 2.5.4-1 (SER p. 2-241) – “Minimum shear wave velocity of soil at plant foundation level” of 1000 fps – become incorporated into the ESP license documents: will it be a Permit Condition, COL Action Item, etc.?</p>
52	2-230	2.5.4.1.5	<p>In regards to foundation design, how will the following SSAR commitments be reflected in the ESP license and addressed at the COL stage:</p> <p>(A) Investigate V_p zone at foundation depth (SSAR p. 2.5-78).</p> <p>(B) Evaluate uplift and dynamic loadings (SSAR p. 2.5-86).</p>

Inquiry No.	SER Page	SER Section	Inquiry
53	2-233	2.5.4.3.1	<p>COL Action Item 2.5-3 is a commitment to perform additional borings, laboratory testing, and a geophysical survey to define site stratigraphy.</p> <p>(A) Explain your rationale in evaluating whether there is sufficient information to evaluate potential fatal flaws for the ESP license.</p> <p>(B) Are all the different needs for additional subsurface information (e.g. aquifer boundaries, perched zones, hydraulic parameters, geotechnical engineering parameters, stratification delineation, observations of potential faulting in the Pleistocene deposits, defining the limits and properties of the fill, etc.) sufficiently stipulated in this COL Action Item to assure that they will be made at the COL stage?</p> <p>(C) Are three borings a reasonable representation of standard practice for indicating site variability to assure no fatal flaws in the acceptability of the ESP, specifically the impracticability of delineating, removing or bypassing all material with <1000 fps shear velocity?</p> <p>(D) What is meant by a geophysical survey or is “geophysical surveys” a better term?</p>
54	2-240	2.5.4.3.7	<p>The SER states that the Applicant “does not expect to encounter any Holocene materials or relatively loose sands or silts that may be susceptible to liquefaction at the ESP site location.” However, there were only three borings made in the ESP site and in each of those there were many low blow-counts obtained in the loess. As an aeolian material, wouldn’t this strata be susceptible to liquefaction at the anticipated low densities actually reported for this material?</p>
55	2-241	2.5.4.3.10	<p>Why isn’t the Applicant’s commitment to require a minimum V_s of 1000 fps at the foundation grade a COL Action Item?</p>

Inquiry No.	SER Page	SER Section	Inquiry
56	2-242	2.5.5.1	<p>Statements of site stability seem to be contradicted by the observed slough in the loess.</p> <p>(A) Why are the slope movements on the bluff called a postulated slump instead of just a slump?</p> <p>(B) To support the ESP, what field studies have been made to investigate the stability of the bluff and creep characteristics of the loess?</p> <p>(C) Why isn't the existing scarp (i.e. slough) indicative of recent movements and potential bluff instabilities?</p> <p>(D) The SER states that the plant will likely be setback 100' from the bluff, but the SSAR (p. 2.5-84) notes a 150' setback. How does the safety factor for stability change for the variation in these distances, and what is considered an adequate safety factor?</p> <p>(E) Would the static safety factor be influenced by blast induced pressure waves and aggravated by potential liquefaction?</p>
57	2-243	2.5.5.3	<p>(A) How is the Applicant's restricting the location of the PPBA to 110' from the west side bluff area incorporated into the ESP license documents?</p> <p>(B) Why wasn't a distance of 150' used in accordance with the SSAR?</p> <p>(C) Why wasn't this requirement turned into a COL Action Item?</p>
58	2-243	2.5.5.3	<p>Why isn't quantitative stability and deformation analyses of bluff – incorporating retrogressive failures with erosion – part of the ESP analyses?</p>
59	2-246	2.5.6	<p>Why isn't COL Action Item 2.5-11 – flooding of the Mississippi River and erosion of the bluff – an open item to be addressed at the ESP application stage?</p>
60	General	11	<p>(A) How do the algorithms from GASPAR relate to those used in RESRAD?</p> <p>(B) What was the rationale for selection of GASPAR to model gaseous effluent exposures?</p>
61	General	11	<p>The SER does not appear to include an independent Staff evaluation of this section. There is only a summary of what is contained in SSAR § 3.2 and ER §§ 3.5 & 5.4. Please identify the nature of the Staff's review of this section.</p>

Inquiry No.	SER Page	SER Section	Inquiry
62	11-2	11.3.1	<p>The SER states that the Applicant will control and monitor the release of gaseous effluents from the facility. How? Also provide the Staff's analysis of how this will insure compliance with 10 CFR Part 20.</p> <p>The Applicant provided bounding gaseous effluent release data. How did the Staff verify the accuracy and adequacy of this data?</p>
63	11-2	11.3.1	<p>The SER states that the calculated gaseous pathway total body dose is 0.844 mrem/yr. However, SSAR Table 3.2-5 indicates 1.62 mrem/yr. Is there a reason for this discrepancy?</p>
64	11-2	11.3.1	<p>Is there a table that compares the composite normal release provided in the ER (e.g. Table 3.0-8) to the criteria limits in Table 2 of 10 C.F.R. Part 20, Appendix B?</p>
65	11-3	11.3.2	<p>What was the rationale for selection of LADTAP II to model liquid effluent exposures?</p>
66	11-3	11.3.2	<p>Where in the SSAR is it evident that the Applicant calculated a liquid pathway dose of 2.17 mrem/yr?</p>
67	General	13	<p>Most of section 13 is incomplete and contains requirements to be addressed at the COL stage. Why shouldn't the critical issues of emergency planning and evacuation be resolved at the ESP stage?</p>
68	General	13	<p>The ESP application incorporates the current state and local emergency plans. During the limited appearance session held in Port Gibson on August 28, 2006, certain local officials indicated that their emergency plans required updating. Will the Staff be requiring the Applicant to update the emergency plans, or work with the communities surrounding the Grand Gulf site to update the plans, as part of the COL process? Particularly, will the Staff require the Applicant to incorporate lessons learned from Hurricane Katrina?</p>

Inquiry No.	SER Page	SER Section	Inquiry
69	13-4; 13-56 to 13-92	13.3.1.1; 13.3.3.11	<p>The SER states that “In Section 2.2.1 of Part 4, the applicant further noted that a detailed evaluation of the original 1986 ETE undertaken in May 2003 more fully considered the impact of historical population growth and transportation system improvements.” This was an evaluation of the 1986 ETE, but was not identified as replacement of the 1986 ETE to bring the entire study up to date.</p> <p>(A) Why was this not a full update of the 1986 ETE, and why is it acceptable to the Staff in light of the lessons learned from Hurricane Katrina?</p> <p>(B) The 1986 ETE is not consistent with NUREG/CR-4831, which was published after the 1986 ETE was performed. The 2003 ETE seems to be incomplete. For example, it made no attempt to update (or review) the modeling used in the 1986 ETE study. The large number of RAs associated with section 13.3.3.11 is indicative of the need to fully update the 1986 ETE study.</p> <p>(C) Does the Staff consider this evaluation to be adequate for a COL application? If not, why is there not a COL Action Item to formally update the 1986 ETE in its entirety?</p>
70	13-8	13.3.1.1	<p>The SER states that in RAI 13.3-73, the Staff asked the Applicant to discuss other factors in addition to evacuation, such as the availability of adequate shelter facilities. In its response the Applicant “noted that, given the existence of fully approved, exercised, implemented, and periodically updated State and local plans, <u>a presumption exists concerning the current adequacy of these plans</u> and their effectiveness in providing required protective actions, including evacuation and shelter.” (emphasis added).</p> <p>How did the Staff verify the acceptability of this presumption?</p>
71	13-25 to 13-26	13.3.3.3.1	<p>The SER indicates that the Applicant “expects” that arrangements will be made for ambulance and medical services for the new facility, similar to the current facility. What is the basis for this expectation? Also, how would injured or contaminated individuals be transported to the Ochsner Clinic which is a significant distance from the proposed facility.</p>

Inquiry No.	SER Page	SER Section	Inquiry
72	13-27	13.3.3.3.3	<p>The SER states that the Staff agrees with the Applicant – in its response to RAI 13.3-16 and 13.3-17 – that “LOAs with private sector organizations are outside the scope of the 10 CFR 52.17(b)(3) requirement and will be provided at the COL stage.”</p> <p>(A) Why is this not a COL Action Item?</p> <p>(B) Has the Staff evaluated the capability of these facilities to provide the expanded support needed for the additional ESP facility? Did the Staff evaluate the adequacy of the proposed training described in section 3.15 of the Applicant’s ESP application?</p>
73	13-32	13.3.3.4.3	<p>Nuclear facilities in the vicinity of the Grand Gulf facility were not identified by the Applicant in the SSAR, nor identified by the Staff in the SER. Emergency coordination between the ESP facility and GGNS-1 is also not discussed. Why didn’t the Staff require the Applicant to identify other nuclear facilities that can be relied on to provide assistance in an emergency?</p>
74	General	13.3.3.6	<p>NUREG-0654, Appendix 1, indicates that notification should be made to the NRC within 15 minutes for an unusual event and <u>sooner</u> for other classes. The time is measured from the recognition by the operator of the events associated with a particular declaration. Shouldn’t this be reflected in the emergency plan?</p>
75	13-45	13.3.3.7.3	<p>Draft SER Open Item 13.3-1a is identified as resolved, but it has been re-categorized as an item to be incorporated into the COL stage. Shouldn’t this be a COL Action Item? If no, why not?</p>
76	13-52 to 13-53	13.3.3.9.3	<p>Open Item 13.3-3 describes the need for additional information regarding OSC, TSC, & EOF. The Staff states that there is insufficient description of the emergency facilities and related equipment for the TSC, OSC, & EO and, therefore, concludes that proposed major feature H is unacceptable. How has this been resolved?</p>
77	13-90	13.3.3.11.3	<p>Discuss the Staff’s analysis of the Applicant’s response to RAI 13.3.79c, and explain why the Staff considers the Applicant’s response to be acceptable.</p>

Inquiry No.	SER Page	SER Section	Inquiry
78	13-90 to 13-91	13.3.3.11.3	Open items 13.3-1c, g, h, and i are noted in the SER as “resolved,” however, they appear to be pending for the COL stage since “arrangements would need to be expanded to incorporate relevant aspects of a proposed new reactor design in a COL . . . application.” As such, shouldn’t these be replaced as COL Action Items?
79	13-94	13.3.3.12.1	The Applicant noted that it will write specific emergency procedures for the issuance of permanent record dosimetry devices and self-reading dosimeters to emergency personnel. How will this commitment be documented so that compliance can be verified at the COL stage?
80	13-116	13.6.3	Explain the Staff’s analysis of why restriction to river access is not required given the fact that the new facility will sit in close vicinity to the east side of the Mississippi River.
81	General	15.1; (SSAR § 3.3.1)	Section 15.1 lists the DBAs that were chosen for radiological analysis. The SSAR indicates that Regulatory Guide 1.183, NUREG-0800, and NUREG-1555 were used to pick these events. The events shown in SSAR § 3.3.1 include those in Regulatory Guide 1.183 plus small line breaks outside containment. Events such as feedwater line breaks, liquid & gaseous tank Failures, reactor coolant pump shaft break and spent fuel cask drops are not included. These are identified in NUREG-0800 and also identified in the AP1000 DCD. In addition, the AP1000 DCD (<u>see</u> DCD §§ 15.7.3, 15.7.6) requires the COL Applicant to evaluate a liquid rad waste tank failure. What was the Staff’s rationale for excluding certain events from its review?
82	15-1 to 15-2	15.1; (SSAR § 3.3.1)	The DBA events listed in the SER are not fully consistent with the events listed by the Applicant in the SSAR. Additional events were included in the SSAR, specifically: reactor coolant pump shaft break and PWR feedwater system pipe break. Why were these events excluded from the Staff’s review?

Inquiry No.	SER Page	SER Section	Inquiry
83	15-2	15.1	<p>The SER cites Regulatory Guide 1.183. Section 4.1.5 of the Guide states that “[t]he maximum two-hour TEDE should be determined by calculating the postulated dose for a <u>series of small time increments</u> and performing a ‘sliding’ sum over the increments for successive two-hour periods. The maximum TEDE obtained is submitted. <u>The time increments should appropriately reflect the progression of the accident to capture the peak dose interval between the start of the event and the end of radioactivity release.</u>” (emphasis added).</p> <p>What time increments were used by the Staff in determining the maximum 2-hour dose, and what was the basis for the choice?</p>
84	15-2	15.1	<p>Are the methodologies used by the Applicant to develop time dependent activity releases in response to RAI 3.3-2 consistent with the AST for the AP1000 and TID source term for the ABWR?</p>
85	15-2 to 15-3	15.1	<p>In RAI 3.3-4 the Staff indicated that the AP1000 DCD updated its X/Q values and asked whether the Applicant planned to use updated values in revising its application. The Applicant responded that it chose not to use them for the ESP. In addition, in RAI 3.3-7, the Staff asked the Applicant to provide the X/Q ratios between the ESP and DCD values.</p> <p>(A) What are the obligations of a COL applicant with respect to X/Q values?</p> <p>(B) How would this vary for different plant designs?</p> <p>(C) Should this be a COL Action Item? If no, why not?</p>
86	15-3	15.2	<p>The applicable NRC guidance documents used by the Staff appear to be incomplete. Given that the ABWR offsite dose analyses performed by the Applicant did not utilize the AST approach, why did the Staff not utilize Regulatory Guides 1.4, 1.5, and 1.7?</p>
87	15-3	15.2	<p>Was an independent review conducted by the Staff for the ABWR non-AST evaluation, and the AP1000 AST evaluation?</p>
88	15-5	15.3.1	<p>The SER states that “At the time of any [COL] application that might be filed with respect to . . . the Grand Gulf ESP site, the applicant will confirm, and the staff will evaluate, whether the analyses considered here bound the design proposed in the COL or CP application.”</p> <p>Why was this requirement not identified as a COL Action Item analogous to COL Action Item 11.1-1?</p>

Inquiry No.	SER Page	SER Section	Inquiry
89	15-8	15.4	What specific parameters of the PPE were used as inputs to the radiological consequence analyses? How realistic and reasonable are these PPE values?
90	General	App. A	Why did the bluff height characteristics found in Appendix A of the draft SSAR, no longer play a role in the Staff's evaluation?
91	A-2 to A-3	App. A.1	The SER states that it "is proposing that the Commission include eight permit conditions," but only 3 are listed. What were the other 5 permit conditions and how were they resolved?
92	A-2	App. A.1	<p>Permit Condition No. 2 requires that an Applicant referencing this ESP to "design any new unit's radwaste system with features to preclude any and all accidental releases of radionuclides into any potential liquid pathway."</p> <p>(A) What is the existing groundwater quality?</p> <p>(B) What monitoring is proposed to verify groundwater compliance?</p> <p>(C) If present, how will the existing impacts be separated from any potential new impacts from an additional plant?</p> <p>(D) Does this Permit Condition not say that any level of detected radionuclides would automatically be a license violation?</p> <p>(E) When would the monitoring plan and action plans to address detected levels be developed, and are there any reasons not to address these plans at the ESP stage?</p>
93	A-4	App. A.2	Why is the North Anna ESP referenced in the introduction paragraph?
94	A-6	App. A.2	COL Action Item 2.4-9: Why hasn't the detailed characterization of the ground water been performed at the ESP stage? Isn't it needed to assure site suitability?
95	A-18	App. A.4	Appendix A.4 identifies a PPE value, or bounding parameter value, as "one that necessarily depends on a site characteristic." We cannot correlate the PPE parameters with the list of site characteristics in Appendix A.3. There are a number of other important site related PPEs that are not identified as bounding. What characteristics make a PPE parameter "bounding"?

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
)
SYSTEM ENERGY RESOURCES, INC.) Docket No. 52-009-ESP
)
)
(Early Site Permit for Grand Gulf ESP Site))

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing LB ORDER (ISSUING QUESTIONS RELATING TO THE GRAND GULF EARLY SITE PERMIT SAFETY EVALUATION REPORT) have been served upon the following persons by U.S. mail, first class, or through NRC internal distribution.

Office of Commission Appellate
Adjudication
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Administrative Judge
Lawrence G. McDade, Chair
Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Administrative Judge
Nicholas G. Trikouros
Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Administrative Judge
Richard E. Wardwell
Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Robert M. Weisman, Esq.
Ann P. Hodgdon, Esq.
Patrick A. Moulding, Esq.
Office of the General Counsel
Mail Stop - O-15 D21
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Diane Curran, Esq.
Harmon, Curran, Spielberg
& Eisenberg, L.L.P.
1726 M Street, NW, Suite 600
Washington, DC 20036

Docket No. 52-009-ESP
LB ORDER (ISSUING QUESTIONS RELATING TO THE GRAND
GULF EARLY SITE PERMIT SAFETY EVALUATION REPORT)

Kathryn M. Sutton, Esq.
Paul M. Bessette, Esq.
Morgan, Lewis & Bockius, LLP
1111 Pennsylvania Avenue, NW
Washington, DC 20004

[Original signed by Evangeline S. Ngbea]

Office of the Secretary of the Commission

Dated at Rockville, Maryland,
this 13th day of September 2006