UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

ACRSR-2131

June 14, 2005

Mr. Luis A. Reyes
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-00001

SUBJECT: INTERIM LETTER: DRAFT SAFETY EVALUATION REPORT ON GRAND GULF EARLY SITE PERMIT APPLICATION

Dear Mr. Reyes:

During the 523rd meeting of the Advisory Committee on Reactor Safeguards (ACRS), June 1-3, 2005, we met with representatives of the NRC staff and System Energy Resources, Inc. (SERI), the applicant for an early site permit (ESP) for the Grand Gulf site, and discussed the application and the NRC staff's draft Safety Evaluation Report (SER). This matter was also discussed during the meeting of our Early Site Permit Subcommittee on May 16, 2005. We are conducting our review of early site permit applications to fulfill the requirement of 10 CFR 52.23 that the ACRS report on those portions of an ESP application that concern safety. We had the benefit of the documents referenced.

CONCLUSION AND RECOMMENDATION

The staff has prepared a quality draft SER of the SERI application for the Grand Gulf early site permit. The draft SER should be augmented with a more complete exposition on threats posed by transportation accidents on the river adjacent to the proposed site.

DISCUSSION

The SERI application is the second early site permit application we have reviewed. At the time of our review, 23 items remained under discussion between the staff and the applicant. We determined that none of these open items precluded our review of the application and the draft SER for the purpose of preparing this interim report.

SERI seeks a site permit for a reactor or a set of reactor modules of total power up to 4300 MW_{th} on a site adjacent to the current Grand Gulf Nuclear Power Station Unit 1, a BWR/6 with a Mark III containment. With the additional unit or modules, the total nuclear generating capacity would be 8600 MW_{th}. The Grand Gulf site had previously been approved for two units, but the second unit was never completed.

- Nature of the Proposed Site

The proposed site is located on the eastern side of the Mississippi River about 25 miles south of Vicksburg, Mississippi. The site is quite rural in nature. There is little industrial activity near the site and no nearby military bases. There is a natural gas pipeline somewhat more than 4 miles from the site.

The nearest major airport is at Jackson, Mississippi, about 65 miles from the proposed site. Air traffic corridors near the site have been determined by the staff to pose no undue risk. There is a highway 4½ miles from the site. The principal ground transportation hazard, however, is thought to involve the delivery of hydrogen to the site for use in the currently operating boiling water reactor.

There is, of course, an important river transportation corridor 1.1 miles from the site. The staff should provide a more explicit characterization of the proposed site in terms of accidents on the river. The staff needs to augment the treatment of explosion and fire events with a discussion of the potential for accidents involving release of toxic chemicals such as chlorine and ammonia.

- Population in the Vicinity of the Site

The permanent population around the site is low. The nearest town, Port Gibson, Mississippi, is about 6 miles away and has a population of about 1750. The nearest population center, Vicksburg, Mississippi, is 25 miles to the north and has a current population of 27,000. Projected population growth in the area to year 2070 is expected to be small, perhaps less than 20%.

- Geology and Seismicity of the Site

The proposed site is located on consolidated river sediments. Geological investigations show no evidence of significant ground deformations for at least the last 500,000 years and perhaps for the last 5 million years. Salt domes in the area are 6 and 8 miles from the proposed reactor location.

The site is in an area of little seismic activity. The nearest historical seismic event occurred more than 25 miles away. The limiting earthquake source is the New Madrid seismic zone over 200 miles away. SERI has undertaken a probabilistic seismic hazard analysis that takes into account recent revisions made by the U.S. Geological Survey to the frequencies and intensities of events in the New Madrid seismic center. The analysis also considers the possibility of seismic activity along the suspected faults on the Saline River which may not be capable faults. The proposed site is a deep soil site (bed rock is at a depth of about 10,000 feet). SERI has done sufficient characterization of the site to produce analyses of the soil amplification factors. The probabilistic seismic hazard curve developed for the site is bounded by the design safe shutdown earthquake curves adopted in the plant parameter envelope developed by SERI.

- Meteorology

Weather at the proposed site is mild relative to many reactor sites. Vigorous storms such as hurricanes and tornados are the principal weather threats. SERI and the staff have used historical information to characterize these and other weather features of the site. We note that the staff has done a good job critically reviewing and correcting the applicant's historical weather data. We continue to question the defensibility of the methods used by the staff and the applicant to prognosticate the weather at the site over the next 65 years based just on historical frequencies of severe weather events. At the very minimum, staff should review current literature on possible changes in weather in the upper Gulf of Mexico to be confident that the methods used for weather predictions are defensible.

Flooding is a concern about the site given its location adjacent to a major river. The proposed reactor site is, however, on a "bluff" some 65 feet above the normal river levels. Land on the opposite bank of the river is more easily flooded and it is expected, therefore, that river flooding is not a significant threat to the site. Local, onsite flooding will have to be addressed if the permit is granted and a decision is made to construct a power plant on the site.

- Emergency Plans

The applicant has elected to submit for review just the "major features" of emergency planning for the proposed site, as is allowed by the regulations. These major features appear adequate should a new plant be built on the site.

We conclude this report by noting that the staff's draft SER is comprehensive, and, though lengthy, is a well constructed, readable document.

Sincerely,

/RA/

Graham B. Wallis
Chairman

References:

1. U.S. Nuclear Regulatory Commission, Draft Safety Evaluation Report, "Safety Evaluation of Early Site Permit Application in the Matter of System Energy Resources, Inc., a Subsidiary of Entergy Corporation, for the Grand Gulf Early Site Permit Site," April 2005.

2. System Energy Resources, Inc., Grand Gulf Early Site Permit Application, Revision 0, October 2003.

3. U.S. Nuclear Regulatory Commission, Review Standard, RS-002, "Processing Applications for Early Site Permit Applications," May 3, 2004.

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DOCUMENT NAME: E:\Filenet\ML051650415.wpd

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