

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

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

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NRC STAFF BRIEF IN RESPONSE TO CLI-07-07

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Jonathan M. Rund  
Counsel for the NRC Staff

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INTRODUCTION

In accordance with the Commission's Order of February 15, 2007,<sup>1</sup> the staff of the Nuclear Regulatory Commission (Staff) hereby responds to three specific issues raised by the Atomic Safety and Licensing Board's January 26, 2007, Initial Decision authorizing the issuance of the Grand Gulf early site permit (ESP).<sup>2</sup> Specifically, the Staff states its position on:

(1) deferring further site characterization related to radionuclide transport until the combined license (COL) stage; (2) deferring conclusions on short-term damage to the environment and the commitment of resources until the COL stage; and (3) the Board's statement that any power level selected at the COL stage other than the 2,000 MWe target value used in the alternative energy analysis would constitute new information that, if found to be significant, would have to be evaluated at the COL stage.

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<sup>1</sup> *System Energy Resources, Inc.* (Early Site Permit for Grand Gulf ESP Site), CLI-07-07, 65 NRC \_\_\_, slip op. (Feb. 15, 2007).

<sup>2</sup> *System Energy Resources, Inc.* (Early Site Permit for Grand Gulf ESP Site), LBP-07-01, 65 NRC \_\_\_, slip op. (Jan. 26, 2007).

## DISCUSSION

### A. Deferral of Site Characterization Related to Radionuclide Transport Characterization

One of the nine issues the Board focused on during the mandatory hearing dealt with inadvertent radiological releases into ground and surface waters. In discussing this issue in the Initial Decision, the Board stated that Permit Condition 2 (which requires that an applicant referencing the ESP design radwaste systems with features to preclude any and all accidental releases of radionuclides into any potential liquid pathway) “does not fully resolve the uncertainty in the characterization required to address radionuclide transport, and as such, PC-2 does not inherently resolve the issues discussed in FSER Section 2.4.13.” LBP-07-01, slip op. at 36. Further, the Board stated that it is “possibly advantageous to defer further characterization of radionuclide transport to the COL stage when design details and facility locations are available to focus the additional information.” *Id.* at 37. The Commission asked for the Staff’s position on deferring until the COL stage further characterization of radionuclide transport. CLI-07-07, slip op. at 2.

The Staff does not consider further characterization of radionuclide transport necessary at the COL stage as long as an applicant referencing the Grand Gulf ESP (should one be issued) demonstrates compliance with Permit Condition 2.

Section 100.20(c)(3) of 10 C.F.R. requires that, in determining the acceptability of a site for a stationary power reactor, “[f]actors important to hydrological radionuclide transport (such as soil, sediment, and rock characteristics, adsorption and retention coefficients, ground water velocity, and distances to the nearest surface body of water) must be obtained from on-site measurements. . . .”

The Staff explained the importance of these requirements in the Safety Evaluation Report, which states:

Compliance with 10 CFR Part 52 and 10 CFR Part 100 requires that the NRC consider the local geologic and hydrologic characteristics when determining the acceptability of a site to host a nuclear unit(s). The geologic and hydrologic characteristics of the site may have a bearing on the potential consequences of radioactive materials escaping from a nuclear unit(s) of specified type (or falling within a [plant parameter envelope] PPE) that might be constructed on the proposed site. Special precautions should be planned if a reactor(s) will be located at a site where a significant quantity of radioactive effluent could accidentally flow into nearby streams or rivers or find ready access to underground water tables.

. . . . The review considers the radionuclide transport characteristics of ground water and surface water environments with respect to accidental releases to ensure that current and future users of ground water and surface water are not adversely affected by an accidental release from a nuclear unit(s) of specified type (or falling within a PPE) that might be constructed on the proposed site.

NUREG-1840, *Safety Evaluation Report for an Early Site Permit (ESP) at the Grand Gulf Site*, dated April 2006 (SER) at 2-133.

In reviewing the portion of System Energy Resources, Inc.'s (SERI's) application that addressed inadvertent releases of liquid effluents to ground water and surface water, the Staff found that it did not have enough information to determine whether a significant quantity of radioactive effluent could accidentally flow into nearby streams or rivers or find ready access to underground water tables.<sup>3</sup> See SER at 2-139 to 2-140. The Staff, however, concluded that it need not consider factors such as soil, sediment, and rock characteristics; adsorption and retention coefficients; ground water velocity; and distances to the nearest surface body of water in its site suitability determination, if there were no releases of radionuclides to the

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<sup>3</sup> In the context of construction permits (CPs), applicants obtained data on factors such as hydrological transport, adsorption and retention coefficients, ground water velocity, and distances to the nearest surface water body only at the location of systems from which radioactive effluents might be emitted and the release pathways from these locations. In the absence of a particular design and specified building locations, an applicant would have to obtain detailed data over the entire area of the site to satisfy 10 C.F.R. § 100.20(c)(3).

ground water. Under such circumstances, design features (rather than site characteristics) will provide adequate protection of the public health and safety. It was for this reason that the Staff proposed Permit Condition 2, which obviates the need for the applicant to obtain detailed data on these factors over the entire area of the site. Accordingly, proposed Permit Condition 2 resolves all issues discussed in SER Section 2.4.13 because further characterization of radionuclide transport would not be necessary at the COL stage as long as an applicant referencing the Grand Gulf ESP (should one be issued) demonstrates compliance with Permit Condition 2. Therefore, for purposes of 10 C.F.R. § 100.20(c)(3), Permit Condition 2 resolves this aspect of site acceptability.<sup>4</sup>

B. Deferring Conclusions on Short-Term Damage to the Environment and the Commitment of Resources

As part of its mandatory hearing responsibilities, the Board was required to determine, *inter alia*, whether the requirements of Section 102(2)(C) of the National Environmental Policy Act of 1969, as amended (NEPA) had been met. In pertinent part, Section 102(2)(C) requires that the NRC address “the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” and “any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.”

In the Initial Decision, the Board stated that the Staff finding “that there would be no short-term damage to the environment associated with the ESP and that there would be no

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<sup>4</sup> Should an applicant referencing the ESP request a variance for Permit Condition 2, additional site characterization would be necessary and, to the extent that such additional analysis might later be needed, the Board is correct in noting that it is “possibly advantageous to defer further characterization of radionuclide transport to the COL stage when design details and facility locations are available to focus the additional information.” LBP-07-01, slip op. at 37. See SER at 2-140 (noting that “important details are not available for the staff to fully consider the effect of an accidental release of liquid effluents in ground and surface waters, including the exact location of radwaste storage facilities, the location and elevation of likely points of release, and detailed characterization of liquid pathways above and below ground from the point of release to the accessible environment”).

commitment of resources, because the ESP does not authorize SERI to perform any construction activities . . . is inconsistent with [Council on Environmental Quality] regulations, which require any agency to consider actions that are related to other actions that could lead to a significant impact on the environment.” LBP-07-01, slip op. at 96 (citing 40 C.F.R. § 1508.27(b)(7)). Further, the Board stated that, although the NRC must consider these issues because construction and operation “are directly related to granting the ESP license and could lead to a significant impact on the environment . . . this finding did not ultimately affect the Board’s decision in this proceeding because these issues are unresolved and deferred to the COL stage when the plant design is selected.” *Id.* The Commission asked for the Staff’s position on deferring until the COL stage the short-term use and long-term productivity issue and the irreversible and irretrievable commitments of resources issue. CLI-07-07, slip op. at 2.

The Staff believes it is appropriate to defer both of these issues until the CP or COL stage. First, it would have been inappropriate to make a final determination on the relationship between short-term uses and long-term productivity at this point because resolution of this matter necessarily involves the benefits of construction and operation and the Staff did not assess the benefits. Second, the Staff was unable to make a final determination on the irreversible and irretrievable commitment of resources issue because the Staff lacked the information necessary to make such a determination for construction and operation of a reactor, or reactors, falling within the range of reactors used in the ESP application. Each of these issues is addressed in turn.

1. Relationship Between Short-Term Uses and Long-Term Productivity

Without considering the benefits of construction and operation, the Staff could not evaluate the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity. NUREG-1817, *Environmental Impact Statement for an Early Site Permit (ESP) at the Grand Gulf ESP Site*, Final Report, dated April 2006 (FEIS) at 10-8. For an ESP, 10 C.F.R. § 52.18 requires the preparation of an

EIS that focuses “on the environmental effects of construction and operation of a reactor, or reactors, which have characteristics that fall within the postulated site parameters.” However, Section 52.18 makes clear that an EIS for an ESP “need not include an assessment of the benefits (for example, need for power) of the proposed action.” As the Staff explained in the FEIS, “[t]he evaluation of the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity for the construction and operation of the ESP unit or units can only be performed by discussing the benefits of operating the unit. The benefit is the production of electricity.” FEIS at 10-8. Accordingly, because 10 C.F.R. § 52.18 does not require the Staff to include an assessment of the benefits at the ESP stage, the Staff did not make a final determination on the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity for the construction and operation.<sup>5</sup> Therefore, the Staff agrees with the Board that this issue is appropriately deferred until the CP or COL stage.

## 2. Irreversible and Irretrievable Commitment of Resources

Without a reactor design or other information that might allow for a full disclosure of anticipated irreversible and irretrievable commitments of resources that might be made for the range of reactors used in the ESP application, the Staff could not resolve this issue for construction and operation. See FEIS at 10-6 to 10-8. Although the Staff concluded that the granting of the ESP (if considered in isolation from construction and operation) would not result in any irreversible and irretrievable commitments of resources, the Staff was unable to resolve this issue for construction and operation because resolution was dependent on the selection of a reactor design or the availability of other additional information. FEIS at 10-6 to 10-8.

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<sup>5</sup> The FEIS did, however, resolve many environmental issues relating to construction, operation, fuel cycle, transportation, and decommissioning. See FEIS Chs. 4-6.

As with the other unresolved issues in the FEIS, the Staff (1) clearly identified any incomplete or unavailable information and the relevance of such information; (2) summarized existing information that is relevant to evaluating the issue; and (3) evaluated such information based upon reasonable assumptions and the Staff's experience. *Cf.* 40 C.F.R. § 1502.22.

Using this approach, the Staff, in the FEIS, stated:

Irretrievable commitments of resources during construction of the proposed new unit(s) generally would be similar to that of any major construction project. The actual commitment of construction resources (concrete, steel, and other building materials) would depend on the reactor design selected at the CP or COL stage. Hazardous materials such as asbestos would not be used, if possible. If materials such as asbestos were used, it would be in accordance with safety regulations and practices. The actual estimate of construction materials would be performed at the CP or COL stage when the reactor design is selected.

The staff expects that the use of construction materials in the quantities associated with those expected for the new ESP unit or units, while irretrievable, would be of small consequence, with respect to the availability of such resources.

The main resource that would be irretrievably committed during operation of a new nuclear unit or units would be uranium. The availability of uranium ore and existing stockpiles of highly enriched uranium in the United States and Russia that could be processed into fuel is sufficient, so that the irreversible and irretrievable commitment would be of small consequence.

FEIS at 10-6 to 10-8.

This description of irreversible and irretrievable commitments of resources resulting from construction and operation contained in the FEIS is sufficient to satisfy the NRC's obligations under NEPA for an ESP. As the Commission has directed, at the ESP stage, the NRC's NEPA review focuses on evaluating the appropriateness of the site.<sup>6</sup> For example, a key purpose of the FEIS is to allow for "an evaluation of alternative sites to determine whether there is any

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<sup>6</sup> See *Exelon Generation Company, LLC* (Early Site Permit for Clinton ESP Site), CLI-05-17, 62 NRC 5, 48 (2005).



obviously superior alternative to the site proposed.” 10 C.F.R. §§ 52.17(a)(2), 52.18. Although the failure to resolve an issue would be problematic if a comparison of the Grand Gulf ESP site to alternative sites were precluded, the Staff’s review of the irreversible and irretrievable commitment of resources issue did not affect this analysis, as the Staff was able to reach a conclusion on whether there were any obviously superior alternatives to the site proposed.

The Staff believes that the FEIS meets the requirements of NEPA for the ESP and was sufficient to allow the alternative site determination to be made. Accordingly, the Staff believes that it is appropriate to defer resolution of the issue of irreversible and irretrievable commitments of resources for construction and operation until the CP or COL stage.

C. Alternative Energy Analysis and Power Levels Other Than 2,000 MWe

Another issue the Board focused on at the mandatory hearing was the alternatives analyses conducted by the Staff under NEPA. In making its findings relating to the alternative power generation portion of this issue, the Board stated:

For comparison of impacts from the varied plants, the Staff used a site target value of 2,000 MWe as the common basis for the electrical output of the potential generating facilities. The Board finds that any selected power level other than the 2,000 MWe target value would be new information. As a result, the differing power level must be reviewed to determine if it is significant information. If so, any effects of the changed value on the conclusions reached in the alternative energy analysis in the FEIS must be re-evaluated at the COL stage.

LBP-07-01, slip op. at 66. The Commission asked for the Staff’s position on this statement.

CLI-07-07, slip op. at 2.

The Staff agrees with the Board’s statement that any power level selected at the COL stage other than the 2,000 MWe target value used in the alternative energy analysis would constitute new information that, if found to be significant, would have to be evaluated at the COL stage.

In the FEIS, the Staff examined the potential environmental impacts associated with energy alternatives. Specifically, the Staff considered energy alternatives involving new

generating capacity, purchasing electric power from other sources to replace power that would have been generated by a new nuclear facility at the ESP site, a combination of new generating capacity and conservation measures, and other generation alternatives that were deemed not to be viable replacements for a new nuclear facility at the ESP site. See FEIS at 8-3 to 8-24. In conducting its energy alternatives analysis, the Staff used SERI's minimum "target" value of 2,000 MWe. FEIS at 8-3. For the various alternatives considered, the Staff was able to consider environmental impacts for energy sources that were relatively close to the "target" value.<sup>7</sup> For example, the comparison for coal-fired units at the Grand Gulf ESP site evaluated the construction of four 509 MWe units. FEIS at 8-7. The Staff concluded that, from an environmental perspective, none of the viable energy generation alternatives are obviously superior to construction of a new nuclear power generation plant. FEIS at 8-24.

In accordance with 10 C.F.R. § 52.39 and 40 C.F.R. § 1508.28(b), the Staff will use NEPA tiering principles and incorporation by reference at the COL stage to provide issue preclusion for issues that were resolved, but will consider whether there is any significant new information regarding such issues. The Staff believes that, in the context of a COL application that references an ESP, the term "new" in the phrase "significant new information" includes any information that was both (1) not considered in preparing the ESP EIS (as may be evidenced by references in these documents, applicant responses to requests for additional information, comment letters, etc.) and (2) not generally known or publicly available during the preparation of the EIS (such as information in reports, studies and treatises). This new information may or

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<sup>7</sup> However, because the nuclear reactor types considered by SERI ranged up to 1,500 MWe, the Staff multiplied unit specific PPE values to create PPE bounding values that reflected multiple reactor units representing a total generation capacity that met the SERI's stated target of at least 2,000 MWe. Consequently, the value of 4,300 MWt for the site was doubled to 8,600 MWt for the site, so that 1500 MWe was doubled to about 3,000 MWe in order to exceed the floor of 2,000 MWe. Accordingly, the alternative energy analysis essentially consisted of comparing 3,000 MWe of nuclear power against approximately 2,000 MWe of other generating options.

may not be significant. For an issue to be significant, it must be material to the issue being considered, *i.e.*, it must have the potential to affect the Staff's evaluation of the issue.

In preparing the ESP FEIS, the Staff did not consider alternative generation sources that did not generate approximately 2,000 MWe. Accordingly, if a COL applicant referencing the Grand Gulf ESP selects a power level other than 2,000 MWe, that would constitute new information, which may or may not be significant. If the chosen power level has the potential to affect the ESP FEIS alternative energy analysis, then the Staff would evaluate whether such information is significant.

#### CONCLUSION

For the foregoing reasons, the Staff submits that the Commission need not modify the Board Initial Decision in LBP-07-01 with respect to any of the questions discussed above.

Respectfully submitted,

**/RA/**

Jonathan M. Rund  
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Dated at Rockville, Maryland  
this 26th day of February, 2007

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NUCLEAR REGULATORY COMMISSION

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CERTIFICATE OF SERVICE

I hereby certify that copies of the "NRC STAFF BRIEF IN RESPONSE TO CLI-07-07" in the captioned proceeding, have been served on the following through deposit in the NRC's internal mail system; through deposit in the NRC's internal mail system, with copies by electronic mail (as indicated by an asterisk), or by deposit in the U.S. Postal Service, with copies by electronic mail (as indicated by a double asterisk) this 26th day of February, 2007:

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