

**POLICY ISSUE**  
(Information)

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SECY-03-0105

FOR: The Commissioners

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SUBJECT: EARLY SITE PERMIT (ESP) APPLICATION READINESS

PURPOSE:

To inform the Commission of the staff's efforts to prepare for the review of early site permit (ESP) applications from Exelon Generating Company (Exelon), Entergy Operations, Inc. (Entergy), and Dominion Generation (Dominion).

BACKGROUND:

In SECY-03-0005, "Semi-Annual Update of the Status of New Reactor Licensing Activities," dated January 8, 2003, the staff committed to inform the Commission of any policy issues identified during stakeholder interactions and of staff efforts to resolve these issues prior to receipt of the first ESP application. At this time, the staff has not identified any policy issues requiring Commission action.

DISCUSSION:

In SECY-02-0076, "Semi-Annual Update of the Future Licensing and Inspection Readiness Assessment," dated May 8, 2002, the staff informed the Commission that there were three prospective applicants for an ESP:

- Exelon stated in a March 1, 2002, letter, that it intended to apply for an ESP by June 2003. Exelon announced on April 30, 2002, that the application will be for the Clinton site.

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- As documented in an April 1, 2002, meeting summary (ADAMS Accession No. ML021010275), Dominion announced that it will apply for an ESP for the North Anna site by September 2003.
- Entergy stated in an April 15, 2002, letter, that it will submit an ESP application for the Grand Gulf site by June 30, 2003. Entergy has recently informed the staff that its application filing will be delayed until July 2003 due to the need to take more time to complete its seismic evaluations.

Entergy, Exelon, and Dominion have obtained funding from the Department of Energy (DOE) to offset some of their application costs through the Nuclear Power 2010 initiative, as discussed in SECY-03-0005.

#### ESP Pre-Application Activities

After notification of the utilities' plans to file an ESP application, the staff undertook the following pre-application activities:

- Developed an ESP review standard (as discussed below).
- Developed inspection and administrative procedures necessary to support the ESP review effort.
- Held public meetings with the Nuclear Energy Institute (NEI) and the prospective ESP applicants on generic issues related to application preparation (as discussed below).
- Developed an integrated work schedule and resource estimates (as discussed below).
- Visited sites to observe applicant data-gathering activities and to confer with individual ESP applicants on site-specific issues.
- Reviewed and provided feedback on ESP applicant quality assurance program plans.
- Held pre-application public meetings near the prospective ESP sites. The purpose of these meetings was to provide information regarding the Nuclear Regulatory Commission (NRC) staff ESP review process and to explain future opportunities for public involvement in that process. On November 14, 2002, the staff conducted the first near-site pre-application ESP public meeting in Port Gibson, Mississippi, for the Grand Gulf site. Other pre-application ESP public meetings were conducted near the Clinton site on March 20, 2003, and near the North Anna site on April 1, 2003.

The staff will continue to identify reviewers, establish technical assistance contracts, schedule meetings with applicants, and interact with the public and other interested stakeholders as part of the preparations for review of ESP applications.

### ESP Review Standard

The staff developed an ESP review standard to (1) clearly define for all stakeholders the scope of the existing regulatory guidance that is necessary for a review of an ESP application, and (2) provide a work-planning framework to enhance the quality and efficiency of the ESP review effort.

On December 26, 2002, the staff released draft ESP Review Standard RS-002, "Processing Applications for Early Site Permits," for public comment and interim use. The public comment period for the subject document ended on March 31, 2003. The draft document may be found at ADAMS Accession No. ML023530045. On April 11, 2003, the staff released, for public comment and interim use, two additional sections of RS-002. The subject areas for these sections are radiological consequence evaluation and quality assurance. The public comment period for these sections ended on June 13, 2003. The staff plans to develop the final review standard by the end of 2003 after reviewing and addressing public comments. With respect to physical security, the staff issued letters to the three prospective ESP applicants on May 6, 2003, to provide guidance on how security measures should be addressed in their applications and inform them of the recently revised design basis threat and reactor interim compensatory measure (ICM) requirements. These letters will be provided to cognizant NRC staff reviewers in lieu of the near-term development of a review standard for physical security. The staff is also developing a paper on Security Requirements for New Reactors, which is due to the Commission in July 2003. The paper will recommend whether additional security design requirements should be applicable to ESPs and discuss resource estimates associated with implementation of the staff proposal.

### ESP Generic Issues

The staff held frequent public meetings with NEI and the prospective ESP applicants to discuss generic issues early resolution of which might enhance the timely review and disposition of an ESP application. A process was developed to document the staff and industry positions. The principal issues were as follows:

- ! quality assurance requirements for ESP information
- ! use of the bounding plant parameter envelope (PPE) approach to characterize facility design
- ! radiological consequence evaluation required by 10 CFR 52.17
- ! use of the bounding approach for providing fuel cycle and transportation information required by 10 CFR Part 51
- ! review of severe accidents and severe accident mitigation alternatives
- ! alternative site review to meet requirements of 10 CFR Part 52
- ! form and content of an ESP

While differences remain between the staff and industry positions on some of the topics discussed, these topics will be resolved during the staff's review of the site-specific applications. If necessary, RS-002 will be revised to reflect the staff's resolution of these or other topics addressed in the site-specific reviews. The three prospective ESP applicants have not indicated that any staff position has impeded or deterred the scheduled filing of their application. The ESP generic issues are discussed in the attachment.

ESP Review Schedule and Resources

In SECY-03-0005, the staff estimated that the review of an ESP application would take approximately 33 months from the submittal of the application to the granting of the permit. This estimate assumes that the applicant provides a high-quality application and that the issues to be addressed at the mandatory public hearing are not overly complex or contentious.

The staff has developed an integrated work schedule process which utilizes a planning tool to document the process steps necessary for the ESP review and to assign critical skills and resources to each step.

The staff will continue to closely monitor the status of the potential ESP applications. In the event of application delays, adjustments to the resource requirements will be made through the staff's planning, budgeting, and performance management (PBPM) process, with consideration of other agency needs and priorities.

In FY 2003, the staff expects to expend about 6.4 FTE and \$744,000 to support pre-application activities and initiation of ESP application reviews. Estimated resource needs increase in FY 2004 to 19.7 FTE and \$4,082,000 for review of the three ESP applications.

CONCLUSIONS:

The staff is prepared to review the ESP applications that Exelon, Entergy, and Dominion are expected to file in June, July and September 2003. The staff held ESP pre-application public meetings, to discuss key issues with NEI and the expected applicants. Public meetings were conducted near the prospective sites to inform the public about the ESP process and opportunities for public participation. A draft ESP review standard was published to inform stakeholders of the scope of the staff's review and to enhance the quality and efficiency of the ESP review effort. Development of the review standard will continue with the goal of improving the efficiency, effectiveness, and realism of the subject ESP staff reviews and ensuring that an appropriate level of safety is maintained for the proposed sites.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections to its content.

/RA/

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Attachment: Staff Assessment of Key NEI Generic  
ESP Positions

## Staff Assessment of Key NEI ESP Generic Positions

An early site permit (ESP) is a Commission approval of a particular site to build a nuclear power plant(s) independent of the facility review. Primarily, the ESP process allows for early consideration and resolution of site suitability issues. Under the ESP process, siting issues should be resolved before the applicant invests a significant amount of capital.

The staff will undertake a three-part review of an ESP application based on information furnished by the applicant as set forth in Title 10 of the *Code of Federal Regulations*, Section 52.17 (10 CFR 52.17). The three parts of the review pertain to site safety, emergency preparedness, and environmental impacts. Dominion Generation (Dominion), Exelon Generating Company (Exelon), and Entergy Operations, Inc. (Entergy), have identified prospective sites for ESPs and have stated they plan to submit ESP applications to the Nuclear Regulatory Commission (NRC) in 2003.

The following issues (and regulations) are addressed in this assessment:

1. Quality assurance requirements for ESP information (10 CFR 52.18)
2. Use of the bounding plant parameter envelope (PPE) approach to characterize facility design (10 CFR 52.17)
3. Radiological consequence evaluation required by 10 CFR 52.17
4. Use of the bounding approach for providing fuel cycle and transportation information required by 10 CFR Parts 51 and 52
5. Review of severe accident mitigation alternatives and severe accidents
6. Alternative site review to meet requirements of 10 CFR Part 52
7. Form and content of an ESP (10 CFR 52.24)

The detailed discussions of issues on the following pages summarize the issues, the current regulations, the Nuclear Energy Institute's (NEI's) position, the staff's considerations, and the staff's positions.

1. Quality assurance (QA) requirements for ESP information (10 CFR 52.18)

### Issue

What are the QA requirements for ESP information (site characteristics) that may be used in the design and safety analyses for safety-related systems, structures, and components (SSCs)?

### Current Regulations

Appendix B to 10 CFR Part 50 states in part that “. . . in this appendix, ‘quality assurance’ comprises all those planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service.”

10 CFR 52.18 states in part that “Applications filed under this subpart will be reviewed according to the applicable standards set out in 10 CFR Part 50 and its appendices and Part 100 and its appendices as they apply to applications for construction permits for nuclear power plants.”

Section 52.39(a)(2) states in part that “[i]n making the findings required for issuance of a construction permit, operating license, or combined license, or the findings required by § 52.103 of this part, if the application for the construction permit, operating license, or combined license references an early site permit, the Commission shall treat as resolved those matters resolved in the proceeding on the application for issuance or renewal of the early site permit . . .”

10 CFR 52.83 states in part that “. . . all provisions of 10 CFR Part 50 and its appendices applicable to holders of construction permits for nuclear power reactors also apply to holders of combined licenses issued under this subpart.”

### NEI's Position

ESP applicants may apply Appendix B or non-Appendix B alternative quality processes to provide adequate confidence in the completeness, accuracy, and overall quality of ESP information. ESP applicants may, but are not required by Section 52.17 to, describe their quality processes in ESP applications. The NRC should review ESP applications for completeness and accuracy of the information presented. Unless the ESP applicant commits to using Appendix B, NRC reviews for compliance with Appendix B would not be appropriate. Pre-application submittal of quality process information is at the discretion of future ESP applicants. ESP information approved by the NRC is appropriate for use in a combined license (COL) application as provided by 10 CFR Part 52, Subpart C. Existing NRC guidance should be modified, and the forthcoming ESP Review Standard should reflect that Appendix B is not mandatory for ESP-related activities.

### Discussion

This topic, which is identified as ESP-3 on the list of NEI generic ESP issues, was discussed during public meetings between NEI and the staff on April 24 and December 5, 2002. Subsequently, NEI documented its position on this topic in a letter dated December 20, 2002 (ADAMS Accession No. ML030370058).

If an applicant were to request a COL, without referencing an ESP, the application, including data collection, analysis, and evaluation of site characteristics, would have to meet the QA requirements in Appendix B to Part 50, in accordance with 10 CFR 52.83. If the same applicant referenced an ESP in its COL application, 10 CFR 52.18 does not explicitly require the ESP application to meet the QA requirements in Appendix B to Part 50. However, the regulations in 10 CFR 52.39, with certain specific exceptions, require the Commission to treat matters resolved in the ESP proceeding as resolved in making findings for issuance of a COL.

Because of this finality, conclusions made during the ESP phase will be relied upon for use in subsequent design, construction, fabrication, and operation of a reactor that might be constructed on the site for which an ESP is issued. Therefore, the level of quality used to control activities related to data collection, analysis, and evaluation of site characteristics should

be equivalent in substance in the ESP and COL phases. It would not make sense to require a lower level of quality for a COL that references an ESP than for a COL that does not.

ESP activities associated with site safety must be controlled by QA measures sufficient to provide reasonable assurance that future SSCs of a nuclear power plant or plants that might be constructed on the site will perform adequately in service. For example, activities associated with data collection, analysis, and evaluation for soil composition, geology, hydrology, meteorology, and seismology determinations should be subjected to QA controls, commensurate with the importance of the respective activities to design. Further, important-to-safety information derived from recognized authorities, such as the Census Bureau or the National Oceanic and Atmospheric Administration, should be controlled using processes for maintaining data integrity, traceability, document control, evaluation, analysis, and record storage.

#### Staff Position

The staff agrees with NEI that (1) current regulations do not explicitly require implementing a Part 50 Appendix B program in support of an ESP application; (2) there is no current requirement for pre-application review of quality processes; and (3) there is no current requirement to describe the applicant's quality assurance program in an ESP application. However, ESP activities associated with site safety must be controlled by QA measures sufficient to provide reasonable assurance that future SSCs of a nuclear power plant or plants that might be constructed on the site will perform adequately in service. For the reasons stated above, applicants must apply quality controls to each ESP activity associated with the determination of site characteristics and the generation of safety analyses for safety-related SSCs. The staff plans to evaluate quality controls for such activities using the criterion that these controls be equivalent to controls specified in Appendix B.

Regardless of whether the applicant chooses to submit a QA program description with its application, the staff will need to evaluate the applicant's QA controls for information which may be used in the design and safety analyses of safety-related SSCs. If a description of the controls is not submitted with the ESP application, these evaluations will be facilitated through requests for additional information from the staff after the application is docketed. The evaluations will be supplemented by inspection activities.

#### 2. Use of the bounding plant parameter envelope (PPE) approach to characterize facility design (10 CFR 52.17)

#### Issue

Can a bounding PPE approach be used to characterize facility design in an ESP application?

#### Current Regulations

Paragraph (1) of 10 CFR 52.17(a) states in part that "[t]he application must also contain a description and safety assessment of the site on which the facility is to be located. The assessment must contain an analysis and evaluation of the major structures, systems, and components of the facility that bear significantly on the acceptability of the site under the

radiological consequence evaluation factors identified in Sec. 50.34(a)(1) of this chapter.... In addition, the application should describe the following: (i) The number, type, and thermal power level of the facilities for which the site may be used;...(v) The type of cooling systems, intakes, and outflows that may be associated with each facility....”

Paragraph (2) of 10 CFR 52.17(a) states in part that “A complete environmental report as required by 10 CFR 51.45 and 10 CFR 51.50 must be included in the application, provided, however, that such an environmental report must focus on the environmental effects of construction and operation of a reactor, or reactors which have characteristics that fall within the postulated site parameters....”

#### NEI's Position

A PPE is a set of postulated design parameters that serves as a surrogate for actual facility design information. For example, design parameters for maximum building height, acreage for plant facilities, ponds, etc., and cooling water requirements may be specified as PPE values. ESP applications would not reference any specific reactor technology, and the resulting ESP would be applicable for a range of reactor designs, including NRC certified designs, designs for which NRC certification is currently in progress or contemplated, and future designs. An application for an ESP using the PPE approach will contain sufficient information (i.e., design parameters) to support the environmental and site safety evaluations by the NRC staff.

Design parameter values are chosen by the ESP applicant to bound a range of possible future designs. These values may differ among ESP applicants. For example, PPEs may differ due to differences in the technology options considered by each applicant and differences in margins that may be applied to account for uncertainties in design parameter information provided by reactor vendors.

The PPE approach will represent composite parameters not indicative of any specific reactor design. Bounding PPE values would be accepted as presented in the ESP application. NRC approval and endorsement of PPE values will not be requested and is not necessary (i.e., PPE values will not be reviewed for conformance to a specific design).

Granting of an ESP by the NRC does not indicate NRC approval of the site for any specific plant or type of plant. Rather, a PPE-based ESP indicates that the site is acceptable for construction and operation of a plant or plants having characteristics that fall within the site characteristics and design parameters approved in the ESP. ESP applicants bear the risk that the design ultimately selected for the site might fall outside the approved envelope in one or more respects.

It is expected that the information contained in the ESP application will address the information requested in the ESP Review Standard currently under development.

#### Discussion

This topic, which is identified as ESP-6 on the list of NEI generic ESP issues, was discussed during public meetings between NEI and the staff on July 17 and December 5, 2002.

Subsequently, NEI documented its position on this topic in a letter dated December 20, 2002 (ADAMS Accession No. ML030370049).

The PPE approach for ESP is analogous to the suite of postulated site parameters that were assumed to facilitate the design certification applications. During design certification, actual site information is not known, but standard plants were designed to the bounding site parameters specified in the design certification applications.

ESP applicants are compiling design parameter information from reactor vendors into a "PPE worksheet" to facilitate comparison of data and identification of bounding parameter values for use in ESP applications. The PPE worksheet will not be provided as a part of the ESP applications; ESP applications will include only the bounding values determined from the worksheet.

#### Staff Position

The staff agrees with NEI that ESP applicants may use the PPE approach as a surrogate for actual facility information to support required safety and environmental reviews, with the following clarifications:

- ! In a letter dated August 1, 2002, NEI indicated that the information listed in 10 CFR 52.17(a)(1)(i)-(viii) is not required. The omission of this information may complicate the staff review (resulting in increased review time) and have a bearing on the staff assumptions and associated staff findings.
- ! The ESP application information that contains PPE values along with site investigation efforts (i.e., data and analyses), existing information (i.e., data and analyses) and updated tectonic and geological information that can impact site hazards must adequately address the three areas of the ESP review process: site safety, environmental impacts, and emergency preparedness.
- ! The staff understands that PPE values may differ among the ESP applicants. It is the staff's expectation that margins applied to account for uncertainties in PPE values will be identified in the application in order to avoid any ambiguity or confusion with the NEI PPE worksheet or other publicly available PPE information.
- ! NEI has indicated that the PPE values will represent composite parameters that are not indicative of any specific reactor design or type. Therefore, the NRC staff review will determine whether the PPE values are sufficient to enable the NRC staff to conduct its required review and that the PPE values are not unreasonable for consideration in the staff findings to comply with 10 CFR Part 52, Subpart A.
- ! Given that PPE values do not reflect a specific design and will not be reviewed by the NRC staff for conformance to a specific design, the granting of an ESP by the NRC does not indicate NRC approval of the site for any specific plant or type of plant. In addition to the emergency preparedness and environmental impact findings, site approval will be contingent on the staff's ability to make a finding, based on the site criteria in 10 CFR Part 100, that a reactor or reactors having characteristics that fall within the parameters for

the site can be constructed and operated without undue risk to the health and safety of the public. This finding may result in conditions or limitations on the ESP in specific areas, as set forth in 10 CFR 52.24. 10 CFR 51.71(d) also requires consideration of alternatives available for reducing or avoiding adverse environmental effects. The NRC will have to carefully consider the application of the PPE approach in order to address this requirement.

- ! COL applicants who reference an ESP bear the risk that the design ultimately selected for the approved site might fall outside of the terms and conditions of the ESP.
- ! The NRC review will be conducted using the review guidance in the draft ESP Review Standard (ADAMS Accession Nos. ML023530045 and ML030970186). The NRC review will result in safety and environmental impact determinations based upon the NRC's independent evaluation of the information provided in the ESP application, assumptions or limitations or both as established by the staff, and independent information developed by the staff. The staff agrees that a combination of site characteristics and PPE values will constitute the ESP bases.

### 3. Radiological consequence evaluation required by 10 CFR 52.17

#### Issue

What is the guidance for satisfying the 10 CFR 52.17(a)(1) requirement for description and safety assessment of the proposed facility?

#### Current Regulations

Paragraph (1) of 10 CFR 52.17(a) states in part: "The application must also contain a description and safety assessment of the site on which the facility is to be located. The assessment must contain an analysis and evaluation of the major structures, systems, and components of the facility that bear significantly on the acceptability of the site under the radiological consequence evaluation factors identified in Sec.50.34(a)(1) of this chapter. Site characteristics must comply with Part 100 of this chapter."

#### NEI's Position

The site atmospheric dispersion factor (X/Q) is the site characteristic associated with meeting Part 100 requirements, and compliance with Section 52.17(a)(1) is accomplished in the ESP application by determining the site X/Q, including the effect of SSCs, if any, that bear significantly on that result. At the COL stage, the site X/Q is combined with the release history information provided in a design certification, or approved during the COL review of an uncertified design, to determine whether Part 100 requirements are met.

#### Discussion

This topic, which is identified as ESP-7 on the list of NEI generic ESP issues, was discussed during a public meeting held on December 5, 2002. Subsequently, NEI documented its position

on this topic in a letter dated December 20, 2002 and April 10, 2003 (ADAMS Accession Nos. ML030370053 and ML031130074 respectively).

The NRC's regulations in 10 CFR Part 100, "Reactor Site Criteria," present a framework that guides the Commission in its evaluation of the suitability of proposed sites for stationary power and test reactors. The regulations recognize the importance of accident considerations in reactor siting; hence, key elements are the determination of the size of the exclusion area considering postulated accidents with a large fission product release within containment and the evaluation of the radiological consequences in terms of doses.

Accident considerations historically have been of key importance in reactor siting. Major developments in risk assessment, such as the issuance of the Reactor Safety Study (WASH-1400), and NUREG-1150, "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants," as well as the occurrence of the Three Mile Island accident in 1979 and the accident at Unit 4 of the Chernobyl reactor in the Soviet Union in 1986, have heightened awareness, knowledge, and concerns in this area. Siting factors and criteria are important in assuring that radiological doses from normal operation and postulated accidents will be acceptably low. In 1996, the NRC amended its regulations to update the criteria used in decisions regarding power reactor siting (61 FR 65157). In that rulemaking, the Commission modified source terms and dose calculation requirements that apply primarily to plant design and relocated them to 10 CFR Part 50. Conforming changes were made to 10 CFR Part 52 to reflect these changes.

As articulated in RG 4.7, "General Site Suitability Criteria for Nuclear Power Stations," which was revised in conjunction with the 1996 rule, both the exclusion area boundary described by 10 CFR 50.34(a)(1)(ii)(D)(1) and the low population zone described by 10 CFR 50.34(a)(1)(ii)(D)(2) (both of which are defined in 10 CFR 50.2) depend on site characteristics and aspects of the plant design. In effect, certain elements of siting and design have been inextricably linked and remain so. The staff has been consistent in its view throughout the discussion of this issue.

Dose consequence evaluation factors must be considered as required by 10 CFR 52.17(a)(1). Pursuant to 10 CFR 50.34(a)(1), doses from postulated design basis accidents (DBAs) are calculated for hypothetical individuals, located at any point (generally, the closest point) on (1) the exclusion area boundary for a 2-hour period and (2) the outer radius of the low population zone for the course of the accident. The effect of these requirements is to set limits on dose (and on risk) without setting numerical criteria on the size of the exclusion area and low population zone. Whether the dose criteria would be met at the locations where the X/Q does not exceed a certain value must be determined using design information.

X/Q further depends on the design through the footprint of the plant (determines the closest point on the boundary) or through the height of the release or building wake effects in determining the initial dispersion.

In addition, the staff position in SECY-00-0023, "Rulemaking Plan to Standardize the Process for Allowing a Licensee to Release Part of Its Reactor Facility or Site for Unrestricted Use Before Receiving Approval of Its License Termination Plan," articulates the following with respect to meeting 10 CFR 50.34(a)(1) requirements:

In 100.21, the NRC established a list of criteria that must be met by applications for reactor site approval. The evaluations demonstrating that a site met the criteria were based, in part, on the size, as well as the location of the site. Performing a partial site

release could potentially affect the results of the evaluations. The criteria that need to be reexamined to assure continued compliance with the requirements of 50.34(a)(1)(ii)(D) include: (1) radiological effluent releases; (2) radiological dose consequences of postulated accidents; (3) potential hazards associated with nearby transportation routes, industrial, and military facilities; (4) security plan adequacy; and (5) emergency plans.

Regulatory guidance exists for carrying out the necessary evaluations. In many cases, a change in the size of the site will not change the conclusions of the original siting approval. However, the details of a licensee's evaluations for site approval need to be checked to assure that the criteria continue to be met...

Further, SECY-00-0023 states:

In 50.34(a)(1)(ii)(D), the NRC requires reactor licensees to evaluate the offsite radiological consequences of postulated fission product releases. The requirements limit the maximum dose to no more than 25 rem TEDE [total effective dose equivalent] in 2 hours for an individual on the boundary of the exclusion area. Maximum dose is also limited to 25 rem TEDE to an individual located at any point on the outer boundary of the low population zone who is exposed to a radioactive cloud resulting from the postulated fission product release during the entire period of its passage. The definition of these boundaries, unlike the site boundary, does not depend on ownership of the land in question. Performing a partial release [of the reactor facility or site for unrestricted use] would not necessarily change the results of a licensee's evaluation of offsite consequences from a postulated release, but the details of the calculations would have to be checked to assure that the criteria continue to be met.

#### Staff Position

The NRC staff does not agree with the NEI position. Part 100 requirements, which are defined as the siting requirements for Part 52, must be met for the Commission to approve "a site or sites for one or more nuclear power facilities separate from the filing of an application for a...combined license for such a facility" (Section 52.11), and therefore must be addressed at the ESP stage. While the meteorology is solely dependent on the site, the X/Q has a dependency on the plant parameters (height of buildings for evaluation of the building wake effects) and the footprint of the plant (for determination of the closest approach of the release to the boundary). Therefore, X/Q alone cannot be used to meet the criteria for radiological dose consequences of postulated accidents as required by Section 52.17(a)(1) and as set forth in 10 CFR 50.34(a)(1) because both site characteristics and design information are necessary in order to perform the required assessment.

Pursuant to 10 CFR 52.21, the NRC will evaluate whether, taking into consideration the site criteria contained in 10 CFR Part 100, a reactor or reactors having characteristics that fall within the parameters for the site can be constructed and operated without undue risk to the health and safety of the public. In order to make such an evaluation the NRC staff requires complete radiological dose consequence information to ascertain the radiological risks associated with the proposed facility.

If an ESP applicant pursues the PPE approach, the staff expects the application information to include the bounding reactor accident source terms, in addition to X/Q values, so that the staff can evaluate the acceptability of the site under the radiological consequence evaluation factors identified in Section 50.34(a)(1).

4. Use of bounding approach for providing fuel cycle and transportation information required by 10 CFR Parts 51 and 52

Issue

To what extent can Tables S-3 and S-4 of 10 CFR 51.51 and 51.52 be used to determine the environmental impacts associated with fuel cycle and transportation activities in ESP environmental reports?

Current Regulations

In accordance with 10 CFR 51.45, 51.50, and 52.17(a)(2), an environmental report prepared by the applicant for an ESP should provide sufficient information regarding any environmental impacts associated with the production and transportation of reactor fuel. However, light-water reactor (LWR) applicants are expected to rely on the regulatory framework at 10 CFR 51.51 and 51.52 by including Tables S-3 and S-4 in their environmental report. For other-than-LWR applicants, the environmental impacts of the production and transportation of fuel must be described in the environmental report in sufficient detail to provide information on the cumulative environmental, socioeconomic, and human health impacts associated with the fuel cycle and fuel transportation.

NEI's Position

Subject to NRC review in ESP applications, mitigating factors associated with modern fuel cycle and transportation practices may be credited in evaluations to demonstrate that environmental impacts identified in Tables S3 and S4 are representative of the bounding fuel cycle and transportation parameters identified for ESP. Like other bounding parameters in ESP applications, and consistent with understandings established in connection with the PPE approach, it is expected that the NRC staff would review bounding fuel cycle and transportation parameters for ESPs to determine that they are not unreasonable. Detailed NRC technical review for ESPs would focus on applicant evaluations demonstrating that bounding fuel cycle and transportation impacts for ESP fall within those of Tables S3 and S4. Subject to review and acceptance of the evaluations presented in ESP applications, the NRC would be expected to conclude in its final EIS that applicants have adequately addressed the requirements of NEPA/Part 51 and that fuel cycle and transportation impacts evaluated for ESPs are bounded by those of Tables S3 and S4.

Discussion

This topic, which is identified as ESP-8 on the list of NEI generic ESP issues, was discussed during public meetings between NEI and the staff on July 17, 2002, and March 29, 2003. NEI documented its position on this topic in a letter dated May 7, 2003 (ADAMS Accession No. ML031470219).

The fuel cycle and fuel transportation impacts for non-LWR power reactors could be different from those addressed in 10 CFR Part 51. Absent a rule, each COL and ESP applicant referencing a non-LWR would have to submit information on these impacts in their environmental report. The NRC staff would have to address the impacts in the EIS.

Independent of issues raised by NEI, the NRC staff has previously identified the need for rulemaking to revise Tables S-3 and S-4 in 10 CFR 51.51 and 51.52. However, the staff believes that any effort to undertake generic rulemaking on non-LWR-specific fuel cycle and fuel transportation issues would be premature.

#### Staff Position

As noted above, ESP applicants who plan to utilize LWR designs are expected to rely on the regulatory framework at 10 CFR 51.51 and 51.52 by addressing Table S-3 and S-4 applicability in their environmental report.

For other-than-LWR applicants, the staff must review design-specific environmental impacts. The discussion of impacts would serve as a starting point for the NRC's independent assessment and should provide sufficiently detailed information on the cumulative environmental, socioeconomic, and human health impacts of the fuel cycle and fuel transportation. The fuel cycle and fuel transportation impacts for non-LWR power reactors could be different in magnitude or in kind from those addressed in 10 CFR Part 51.

In the event that an ESP application references non-LWR fuel cycle and transportation impacts the staff expects that sufficient information will be provided to allow the staff to meet its regulatory obligations.

#### 5. Review of severe accident mitigation alternatives and severe accidents

##### Issue

To what extent should an application for an ESP consider severe accidents and the mitigation of such accidents?

##### Current Regulations

Paragraph (2) of 10 CFR 52.17(a) states in part: "A complete environmental report as required by 10 CFR 51.45 and 51.50 must be included in the application, provided, however, that such environmental report must focus on the environmental effects of construction and operation of a reactor, or reactors which have characteristics that fall within the postulated site parameters...."

## NEI's Position

NEPA consideration of severe accident issues should be addressed as part of design certification and/or COL proceedings, not at the ESP stage.

## Discussion

This topic, which is identified as ESP-12 on the list of NEI generic ESP issues, was discussed during public meetings on August 22, December 5, 2002, and March 26, 2003. Prior to the December 5, 2002, meeting, this issue was limited to the consideration of severe accident mitigation alternatives. Subsequently, NEI documented its position on this topic in a letter dated December 20, 2002 (ADAMS Accession No. ML030370068).

NEI considers severe accidents and associated mitigation alternatives as a design issue which should be deferred to the COL stage. In particular, the three prospective ESP applicants have not selected a reactor technology.

## Staff Position

With respect to severe accident mitigation alternatives, the staff recognizes that if sufficient design information is not available at the ESP stage, then the NRC review and findings will be deferred to the COL stage. However, the staff expects the applicant to include a characterization of severe accident impacts in its environmental report at the ESP stage.

These positions were articulated in the Nuclear Reactor Regulation (NRR) ESP Review Standard, RS-002, "Processing Applications for Early Site Permits: Draft for Interim Use and Public Comment," dated December 23, 2002. Attachment 3 to RS-002 discusses the applicability of certain sections of NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants," October 1999, to the scope and associated review criteria for the environmental report.

Attachment 3 to RS-002 indicates that Section 7.2, "Severe Accidents," of NUREG-1555 is applicable to the ESP review, but acknowledges that Section 7.3, "Severe Accident Mitigation Alternatives," requires detailed design information and a design-specific probabilistic risk assessment. If detailed design information is not available in the ESP application, then the staff review of and findings on severe accident mitigation alternatives will be deferred to the COL stage. These sections of the Review Standard also reflect the staff position articulated in SECY-91-041, "Early Site Permit Review Readiness."

The staff's expectation for its review of severe accident impacts, is that the applicants would develop appropriate risk metrics (using PPE parameters if detailed design information is not available) based on site-specific characteristics. These risk metrics would be used to determine the acceptability of the proposed site at the ESP stage. Furthermore, they would be used to confirm the design acceptability for the site at the COL stage.

6. Alternative site review to meet requirements of 10 CFR Part 52

Issue

How should the ESP applicant and the staff limit its evaluation of alternative sites?

Current Regulations

Paragraph (2) of 10 CFR 52.17(a) requires an ESP applicant to include in its environmental report an evaluation of alternative sites to determine whether there is any obviously superior alternative to the site proposed.

NEI's Position

The NRC should limit its consideration of alternative sites to existing nuclear sites controlled by the applicant and to the applicant's discussion of generic green-field and industrial sites to confirm the presumption that no obviously superior site exists. This approach would focus the review of alternative sites on those serving the private applicant's needs, consistent with the most recent court decisions. The review would also be focused on those sites that a reasonable person would clearly favor. The approach would similarly result in a more efficient, meaningful, and reasonable review by avoiding a wasteful evaluation of alternatives that an applicant has no intention, means, or wish to develop.

Discussion

This topic, which is identified as ESP-18a on the list of NEI generic ESP issues, was discussed at public meetings between NEI and the staff on July 17 and December 5, 2002. Subsequently, NEI documented its position on this topic in a letter dated December 20, 2002 (ADAMS Accession No. ML030370065). In addition, NEI submitted supplemental comments on Petition for Rulemaking (PRM) 52-2 on this same subject in a separate letter dated December 18, 2002. Both letters contained essentially the same information, but in the December 18, 2002 letter, NEI requested that the Commission address the issue generically because it has implications beyond ESP applications.

NEI cited both legal and policy reasons to justify the action by the staff to limit its required NEPA analysis of alternative sites to those that are pertinent in the context of the specific license application that is before the staff. NEI contends that because of the obvious advantages of an existing nuclear site over nonnuclear sites for the addition of new nuclear units, including the preexistence of essential infrastructure, it is expected that no nonnuclear site would be found to be obviously superior.

Staff Position

At this point, the staff, in general terms, agrees with NEI that the current NEPA case law suggests that a Federal agency, acting on a private entity's permitting request, may limit its review of alternatives according to the proposal before the agency. Nevertheless, the objectives of the action may not be defined in such artificially narrow terms that only one alternative would accomplish the stated goals. See *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196

(D.C. Cir. 1991). Therefore, it is the applicant's obligation to demonstrate, in its environmental report, that its bases for limiting its alternative site analysis are reasonable.

The staff agrees that an ESP applicant need only consider the alternative sites within its region of interest. The applicant, however, must demonstrate that the region of interest, as the applicant seeks to define it, is reasonable. In cases where the proposed facility would not have a determined service area, the ESP applicant would have to articulate a reasonable means of defining the region of interest.

The staff understands the industry position with respect to the advantages of adding additional new nuclear units to an existing nuclear site over building the units on a nonnuclear site. The superiority of alternative sites in comparison to the proposed site will be addressed on a case-by-case basis. NUREG-1555, Section 9.3, lays out the staff's methodology for identifying obviously superior alternative sites. The staff expects that an ESP applicant's environmental report will set forth the bases for the applicant's determination that none of the alternative sites is obviously superior to the proposed site.

## 7. Form and content of an ESP (10 CFR 52.24)

### Issue

What will be the form and content of an ESP?

### Current Regulations

Section 52.24 of 10 CFR states in part that "... the Commission shall issue an early site permit, in the form and containing the conditions and limitations, as the Commission deems appropriate and necessary."

### NEI's Position

NEI developed a sample ESP that follows the form of a construction permit issued for a facility licensee under Part 50, with the content modified to demonstrate the nature of the conclusions that the NRC should make in the ESP context.

### Discussion

This topic, which is identified as ESP-22 on the list of NEI generic ESP issues, was discussed during public meetings on August 22 and December 5, 2002. A sample form and content ESP document was transmitted to the staff as an attachment to the issue resolution letter dated December 20, 2002 on ESP Topic ESP-6, "Use of the Plant Parameter Envelope (PPE) Approach" (ADAMS Accession No. ML030370049). NEI documented its final position on this topic in a letter dated April 30, 2003 (ADAMS Accession No. ML031270382).

#### Staff Position

Although the staff has agreed to provide comments on the sample ESP document developed by NEI, it is premature to discuss specifics on the permit structure at this point. As the staff review of ESPs progresses and issues are resolved, the staff will engage its stakeholders on the form and content of the ESP.