U.S. NUCLEAR REGULATORY COMMISSION

ENVIRONMENTAL STANDARD REVIEW PLAN

9.2.1 ALTERNATIVES NOT REQUIRING NEW GENERATING CAPACITY

REVIEW RESPONSIBILITIES

Primary— Office responsible for the review of energy alternative information

Secondary—None

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review and assessment of the economic and technical feasibility of (1) supplying the electrical energy from the proposed plant without constructing new generating capacity, or (2) initiating energy conservation measures that would avoid the need for the plant. The scope of the review directed by this plan should include consideration of (1) power purchases from other utilities or power generators and reactivation or extended service life of plants within the power system in combinations that should provide a supply alternative to the proposed project and (2) the potential for energy conservation or demand management measures that would be equivalent to the output of the proposed project. Energy sources selected by this review should be compared with the proposed project by the reviewer for ESRP 9.2.3. This ESRP is not applicable to applications for an early site permits (ESPs) that do not include an analysis of energy alternatives.

In performing this review, the reviewer should use the assessment of the need for power prepared by the reviewer of ESRP 8.4.

The term "relevant service area" is used in this ESRP to indicate any region to be served by the proposed facility, whether or not it corresponds to a traditional utility service area. Relevant service area is a situation-specific concept, and it must be defined on a case-by-case basis. Applicants may be power generators rather than a utility; therefore, analysis of existing and projected capacity and alternatives must be sufficiently flexible to accommodate differences in the applicant types and regulatory environments. The concept of "relevant region" is also introduced here to mean an area for which electricity demand forecasts are estimated, such as the Northeast Power Coordinating Council region,

that would usually include the relevant service area, but may not if the applicant intends to sell power to a wider geographic area such as the Eastern United States.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRPs, as indicated:

- ESRP 3.7. Obtain a description of the power transmission system from the reviewer for ESRP 3.7.

- ESRPs 8.1 through 8.4. Obtain a description of the power system, factors associated with the power demand and supply, and an assessment of the need for power. An assessment of the need for power is not required for ESP applications unless the applicant elects to cover need for power in its application.

- ESRPs 9.2.3 and 10.4.3. Provide an assessment of whether any alternatives considered under ESRP 9.2.1 are both feasible and competitive for supplying the electrical generating capacity proposed in the application.

Data and Information Needs

The following data and information should be obtained:

- A listing of the plants in the relevant service area scheduled for retirement during the period extending from date of application through the 6th year of commercial operation of the proposed project, including existing nuclear power plants within the relevant region that are near the end of their license and are candidates for license renewal. Power plants available for reactivation should also be considered.

- A description of the power system, factors associated with the power demand and supply, and an assessment of the need for power.

- The potential for energy conservation within the relevant service area (from ESRP 8.2.2).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of alternatives not requiring new generating capacity are based on the relevant requirements of the following:

- 10 CFR 51.71(d) and 10 CFR 51, Appendix A to Subpart A, with respect to including analysis of alternatives to the proposed action in the EIS.

Regulatory positions and specific criteria necessary to meet the regulations as identified above are as follows:

- Regulatory Guide 4.2, Rev. 2, *Preparation of Environmental Reports for Nuclear Power Stations* (NRC 1976), with respect to the analysis of alternatives to adding new generating capacity.

Technical Rationale

The technical rationale for evaluating the applicant's alternatives not requiring new generating capacity is discussed in the following paragraph:

The consideration of alternatives is the heart of an NRC EIS (10 CFR 51, Appendix A). The review conducted under this ESRP contributes to the consideration of alternatives by addressing alternatives that do not involve the addition of power generation capacity. The results of this review should be considered in the assessment of alternative energy sources and systems conducted under ESRP 9.2.3.

III. REVIEW PROCEDURES

The analysis includes two separate evaluations: the first of power purchases and reactivation and the second of energy efficiency. Projections by Federal, State, regional, local, and affected Native American tribal agencies energy planners may be the most useful source of capacity and demand information available. The reviewer should consult current NRC policies regarding these evaluations for alternative analyses.

The extent of this analysis should be determined by the amount and cost of capacity available through combinations of purchases of power and reactivating or extending the service life of plants within the relevant regional system. To make this determination, the reviewer should conduct a brief initial analysis following the procedures in the following subsections to identify the probable amount of electrical generating capacity available.

Power Purchases

The reviewer should determine if excess generating capacity (capacity beyond reserve margin requirements) will be available for extended periods of time from other sources. The time period to be considered for determining this availability should cover a 6-year period starting with the expected first year of commercial operation of the proposed project. Excess generating capacity of these utilities and/or systems should be summed and compared with the capacity need established by the reviewer of ESRP 8.4.

If sufficient excess capacity has been identified to warrant continuation of this review, the reviewer should do the following:

(1) Determine if adequate transmission line interties exist for the efficient transfer of this power.

(2) Determine the administrative structure of the current generating supply system in the relevant regional grid and the applicant's relationship to this structure in terms of current and projected power supply. Full account should be taken of nondiscriminatory access rules as promulgated by the Federal Energy Regulatory Commission (FERC).

(3) Consult with the reviewer for ESRP 3.7 to identify existing transmission lines and corridors within the region.

(4) If transmission lines and interties are not available, make general estimates of the costs[(a)] to construct and maintain such lines and estimates of the environmental impacts associated with their construction and maintenance.

Plant Reactivation or Extended Service Life

To review the relevant regional (e.g., power pool, power marketing area, major utility service area) inventory of the available generating plants, the reviewer should do the following:

(1) Identify plants now deactivated but potentially operable.

(2) Identify plants scheduled for retirement during the period extending from the date of application through the 6th year of commercial operation of the proposed project.

In considering alternatives, the reviewer should be guided by FERC practice to define relevant markets as those utilities and power generators directly interconnected to the applicant (first-tier markets). For each first-tier market, FERC considers all utilities interconnected to the first-tier utility and all utilities interconnected to the applicant as competitors in that relevant market. Thus, the competitors usually are assumed to include the second-tier utilities that can reach the market by virtue of the applicant's open-access transmission tariff. FERC admits that the open-access rule (61 *Federal Register* 21540) may lead to consideration of an area broader in scope than the first-tier and second-tier markets currently considered. However, evidence of transmission constraints may circumscribe the scope of the relevant market. FERC permits applicants and intervenors to argue that the market is broader or narrower than that offered by second-tier utilities. The argument must be more than open access and involves transmission constraints and cumulative transmission costs.

(a) The cost analyses should be made on the basis of data available in references or that can readily be supplied by the applicant. Costs should include environmental compliance costs.

When sufficient capacity is identified to warrant further analysis,[a] the reviewer should review the estimate of the environmental and operating costs associated with the use of these plants. Factors to be considered in preparing these cost estimates should include the

- capital costs needed to reactivate retired plants and to upgrade existing plants, when necessary, to comply with current standards
- operating costs, including costs associated with meeting current environmental standards (these costs should be adjusted to account for reduced availability factors where applicable)
- environmental costs, including the environmental impacts associated with alternative-energy sources.

Conservation (Energy Efficiency)

The reviewer's analysis of conservation (increased energy efficiency) as an alternative to construction of the proposed plant should be based on the analysis and evaluation of conservation and substitution received from the reviewer for ESRP 8.2.2. Except for unusual circumstances, no additional review should be required to complete this portion of this ESRP, since the reviewers for ESRP 8.2.2 and 8.4, in the process of analyzing and evaluating the need for the plant, should make a determination that conservation is or is not a practical alternative to the proposed plant. The reviewer should consult with and assist the reviewer for ESRP 8.2.2 in analyzing the effects of conservation on the need for the plant and to prepare data for inclusion in this section of the EIS. The reviewer does not need to analyze the potential for conservation if the applicant is proposing to build a merchant plant to sell electric power on the open market and did not address the potential for conservation in the ER (Exelon Generation Co., LLC 2005).

The reviewer should review the relevant regional (e.g., power pool, power marketing area, major utility service area) summation of the total amount of alternative electrical generating capacity available through a combination of purchased power and the reactivation and extended service life of plants within the regional system. If this combined capacity is insufficient to meet the capacity needs through the 6th year of commercial operation of the proposed project, the reviewer may conclude that this alternative is not feasible. Where sufficient capacity is available, the reviewer should consider whether there are any factors unique to the relevant regional system that could prevent the reactivation or extended service life of existing units or the purchase of power from other systems.

The reviewer should ensure that cost data associated with this alternative, including purchases of power, transmission line costs, capital/operating costs and environmental compliance costs of reactivated and extended service life plants, are available and can be compared with the costs of the proposed project.

(a) The reviewer may want to consider the plant-availability factor at this point. The expected availability factors through the 6th year of commercial operation of the proposed project should be used for this analysis.

These cost data should be used by the reviewer for ESRP 9.2.3. Where sufficient electrical generating capacity is available to meet the need established by the reviewers for ESRP Chapter 8.0, and the costs of the alternative are reasonable when compared to costs of the proposed project, the reviewer of ESRP 9.2.1 should provide this assessment to the reviewer of ESRP 9.2.3. However, when costs of this alternative are significantly greater than costs of the proposed project, the reviewer, after consulting with the reviewers for ESRP 10.4, may conclude that the alternative is not practical.

When the reviewer has determined that the alternatives of conservation, power plant reactivation and life extension, and power import have been adequately described and explored, this information should be included in the environmental impact statement (EIS) and communicated to the reviewer of ESRP 9.2.3 for analysis of alternatives.

IV. EVALUATION FINDINGS

The depth and extent of the input to the EIS should be governed by the analyses required to draw the final conclusion for this section. The input should include the basis for rejecting or accepting the alternative and supporting data such as (1) the amount of (or lack of) excess generating capacity available for purchase, (2) the plants within the regional system, if any, available for reactivation or extended service life and their operating costs and availability factors, and (3) the effects of conservation on reducing the need for electrical generating capacity. Alternatives that are found to be competitive should be reported to the reviewer of ESRP 9.2.3. A competitive alternative is one that is feasible and compares favorably with the proposed project in terms of environmental and health impacts. If the proposed project is intended to supply baseload power, a competitive alternative would also need to be capable of supplying baseload power. A competitive alternative could be composed of combinations of individual alternatives.

The characteristics of the alternatives should be described in sufficient detail that a decision can be reached regarding environmental impacts. The NRC staff evaluation supports concluding statements of the following type to be included in the EIS:

> The staff reviewed the available information and concluded that the issues have been covered in sufficient detail for staff analysis of alternatives not requiring new generating capacity.

V. IMPLEMENTATION

The method described in this ESRP should be used by the staff in evaluating conformance with NRC requirements, except in those cases in which the applicant proposes an acceptable alternative for complying with specified portions of the requirements.

VI. REFERENCES

Electric Utilities (Federal Power Act); Promoting Wholesale Competition Through Open-Access Nondiscriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities; Final Rule and Proposed Rule. 61 *Federal Register* 21540-21738 (May 10, 1996).

10 CFR 51, Appendix A, "Format for Presentation of Material in Environmental Impact Statements."

U.S. Nuclear Regulatory Commission (NRC). 1976. *Preparation of Environmental Reports for Nuclear Power Stations*. Regulatory Guide 4.2, Rev. 2, Washington, D.C.

Exelon Generation Company, LLC (Early Site Permit for Clinton ESP site), CLI-05-29 (2005).
