



U.S. NUCLEAR REGULATORY COMMISSION

ENVIRONMENTAL STANDARD REVIEW PLAN

10.4.2 COSTS

REVIEW RESPONSIBILITIES

Primary— Organization responsible for the review of economic information

Secondary— None

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's identification and evaluation of the internal and external costs of construction and operation of the proposed project. The reviewer may rely on an independent analysis of costs by state or regional authorities or the applicant's analysis. An independent assessment may also be prepared. If a review of the applicant's analysis is conducted, the reviewer must ensure that the applicant's assumption, data, and methods have been accepted by all appropriate ESRP reviewers. If reviewers have relied on an independent analysis, the review in this ESRP should be modified accordingly. The scope of the review directed by this plan should include (1) capital costs, fuel costs, operating and maintenance costs, decommissioning costs, and any other identified internal costs, (2) the external costs of impacts (e.g., loss of productivity or loss of wildlife habitat) identified in previous environmental reviews, and (3) other external costs not associated with an identified environmental impact. Costs should be identified for the applicant's proposed project and for any staff-identified alternatives to mitigate adverse impacts. Primary reliance should be placed on quantitative estimates where possible.

At the early site permit stage, 10 CFR 51.75(b) provides that an assessment of costs need not be covered in the EIS unless the applicant chooses to include this information in its environmental report.

Review Interfaces

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

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10.4.2-1

NUREG-1555

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

This Environmental Standard Review Plan, NUREG-1555, has been prepared to establish guidance for the U.S. Nuclear Regulatory Commission staff responsible for environmental reviews for nuclear power plants. The Environmental Standard Review Plan is not a substitute for the NRC's regulations, and compliance with it is not required.

These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Individual sections of NUREG-1555 will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience. Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of New Reactors, Washington, D.C. 20555-0001.

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- ESRPs 3.2 through 3.8. Obtain data relative to the proposed system configuration and costs.
- ESRPs 4.1.1 through 5.8.3. Obtain data relative to the external costs of the project.
- ESRPs 6.1 through 6.7. Obtain data relative to the costs of monitoring systems.
- ESRPs 7.1 through 7.3. Obtain data relative to the costs of postulated accidents.
- ESRP 8.4. Obtain a summary of the benefit-cost balancing related to insufficient baseload capacity or adding capacity too soon.
- ESRPs 9.4.1 through 9.4.3. Obtain data relative to the costs of the proposed facility, together with modifications identified by staff.
- ESRPs 10.1 and 10.2. Obtain data relative to the irreversible impacts and commitments of resources.
- ESRP 10.4.3. Provide input as required to conduct and present the final benefit-cost balance for the proposed project.

Data and Information Needs

This part of the environmental review represents the final summation of all costs, either monetary or environmental (including social), that are predicted for the proposed project and for staff identified alternatives. Consequently, all portions of the environmental review associated with these costs should be considered by the reviewer of this section. The following data or information should be obtained:

- estimated impacts of construction (from ESRP Chapter 4.0)
- estimated impacts of operation (from ESRP Chapter 5.0)
- estimated costs of alternative modifications and additions to the site preparation and construction monitoring programs and preoperational monitoring programs, if any (from ESRP 6.7)
- the environmental impacts of postulated accidents (from ESRP Chapter 7.0)
- estimated construction and operating costs of any alternative plant and transmission systems deemed to be preferable by the staff (from ESRP 9.4)
- estimated costs associated with the staff analysis of the relationship between short-term uses and long-term productivity (from ESRP 10.2)
- estimated costs associated with any irreversible and irretrievable commitments of resources (from ESRP 10.3).

II. ACCEPTANCE CRITERIA

Acceptance criteria of the analysis of costs are based on meeting the relevant requirements of the following:

- 10 CFR 51.45 and 51.71 with respect to the analyses required in the development of the environmental report (ER) and environmental impact statement (EIS)
- 10 CFR 51.50(b) with respect to reviewing applications for early site permits
- 10 CFR 51.50(c) with respect to reviewing applications for combined licenses.

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

- Regulatory Guide 4.2, Rev. 2, *Preparation of Environmental Reports for Nuclear Power Stations* (NRC 1976), with respect to information needs and formats for a benefit-cost balancing.

Technical Rationale

The technical rationale for evaluating the applicant's proposed costs is discussed in the following paragraphs:

In accordance with 10 CFR 51.45, the applicant is required to submit in the ER information needed for evaluating costs associated with the proposed plant. Similar information is required to be present in the EIS pursuant to 10 CFR 51.71.

Reasonably detailed information about the economic costs of the proposed action is needed to assess any potential social or economic impacts that might occur as a result of plant construction or operation. Data in the ER must be adequate to assist the staff in making these determinations.

III. REVIEW PROCEDURES

The estimated internal and external costs to be considered by the reviewer should be based on the project as proposed by the applicant and with modifications accepted by the applicant to mitigate and control predicted adverse impacts. Estimated internal and external costs should be described using the following procedures:

Internal Costs Incurred by the Applicant

- (1) Describe each identified internal estimated cost and outline the method used to obtain the described value (e.g., present worth cost).
 - Reference to other EIS sections may be made (when appropriate) to present the basis for the staff analysis.
- (2) List estimated costs. A sample format is shown in Table 10.4.2-1.
 - Where the information to be presented would be included in the table described in ESRP 10.4.3, the reviewer may reference that table instead of repeating the information in the table for this section.

- Internal costs include capital costs (including the estimated capital cost of added transmission lines to support the proposed project even if the lines are not paid for by the applicant), operating and maintenance costs, fuel costs, and decommissioning costs.
 - Other costs may be classified as internal, when appropriate.
 - Express all internal costs, either provided by the applicant or estimated by the staff, in monetary terms.
 - For all internal costs, determine the present worth cost and levelized annual equivalent cost.
 - Express present worth costs in dollars of the first year of commercial operation of the first unit.
 - Express annual costs in dollars per year and mills per kilowatt-hour for the first year of commercial operation of the first unit.
- (3) Use methods and economic assumptions consistent with those used in the Chapter 9.4 ESRPs, and use the results of calculations presented by the reviewers of the Chapter 9.4 ESRPs when available.
- (a) Where plant capacity affects estimated internal costs, estimate the cost for both the high and low extremes of any range of plant-capacity factors assumed in the review for the Chapter 9.4 ESRPs.
- (b) Sum the present worth values of the internal costs to arrive at a total present worth internal cost of the proposed project.

External Costs

- (1) Estimate each external cost associated with an environmental impact, reference the corresponding environmental statement section, and describe or reference the method used to develop the cost data.
- For quantified costs, show the relationship (significance) of the cost to the regional value of the impacted parameter.
 - Where costs cannot be quantified, estimate the significance of the cost as it relates to regional values.

Cost data may be presented in tabular form or referenced to an equivalent table (if provided) for ESRP 10.4.3.

- (2) Estimate the external costs of project construction and operation in consultation with the reviewers of ESRP Chapters 4.0, 5.0, 6.0, and 7.0.
- Identify and tabulate each unmitigated adverse impact and estimate its cost.
 - Consider the costs of mitigated adverse impacts and appropriately assign these as internal or external costs.

- Estimate costs in monetary or other appropriate terms whenever possible, and determine the significance of costs on a regional^(a) basis.
 - If monetary terms can be estimated, calculate them for the same time (year) selected for the internal-cost analysis.
 - If external costs cannot be quantified, present qualitative cost estimates for each such impact.

The following typical cost terms (shown for a loss of offsite agricultural production) might be used:

Monetary: “Annual loss of \$4000.00 to soybean producers. The annual regional value of this crop to producers is \$200,000.00.”

Quantitative: “Annual loss of 50 hectares of soybean cropland. The regional cropland used for soybean production averages 300 hectares.”

Qualitative: “MODERATE impact to regional production of soybeans.”

(3) For estimated external costs, ensure the following:

- Adverse impacts requiring mitigation or avoidance have been identified.
- The estimated cost assigned to each impact is appropriate.
- The relative significance of each estimated cost has been established and is appropriate to the impact.
- Unavoidable adverse environmental impacts identified in ESRP 10.1 have been considered and assigned cost values, if appropriate.
- All other external costs (e.g., resource commitments) not associated with an identified environmental impact have been considered.

(4) Ensure that any transfer payment (e.g., tax) listed as a benefit in ESRP 10.4.1 has a corresponding cost considered in this section.

(5) If estimated costs of measures and controls to mitigate, or alternatives to avoid, environmental impacts have been considered, ensure that all such costs have been presented in a manner that permits their comparison with corresponding costs of project elements as proposed by the applicant.

(6) If environmentally preferable alternatives have been identified, prepare a cost comparison for these alternatives and the applicant’s proposal.

- Reference the appropriate EIS section describing the impact and ESRP Chapter 9.4 analyses comparing the applicant’s proposal and the alternative(s).

(a) See ESRPs 2.2.3 and 2.5.2 for definitions of “region.”

IV. EVALUATION FINDINGS

Direct the input to this section of the EIS toward accomplishing the following objectives: (1) public disclosure of the estimated costs of the proposed project, (2) presentation of the basis for the staff analysis, and (3) presentation of the staff conclusions as to the relative significance of the estimated costs.

The reviewer should verify that sufficient information has been provided in accordance with the requirements of this ESRP section and that the evaluation supports the following type of concluding statement, to be included in the staff's EIS:

The staff reviewed the available information relative to the estimated costs of the proposed action and concludes that the information is adequate to satisfy the requirements of 10 CFR 51.45 and the intent of 10 CFR 51.71.

V. IMPLEMENTATION

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

VI. REFERENCES

10 CFR 51.45, "Environmental report."

10 CFR 51.50, "Environmental report—construction permit, early site permit, or combined license stage."

10 CFR 51.71, "Draft environmental impact statement—contents."

10 CFR 51.75, "Draft environmental impact statement —construction permit, early site permit, or combined license stage."

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

PAPERWORK REDUCTION ACT STATEMENT

The information collections contained in the Environmental Standard Review Plan are covered by the requirements of 10 CFR Part 51, and were approved by the Office of Management and Budget, approval number 3150-0021.

PUBLIC PROTECTION NOTIFICATION

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.

Table 10.4.2-1. Estimated Internal and External Costs of the Proposed Project

Cost Category	Project as Proposed	With Option 1	With Option 2
Describe Option	As Proposed	[Description]	[Description]
INTERNAL COSTS			
Land			
Labor			
Materials			
Equipment			
Services			
Indirect (e.g. Overhead)			
EXTERNAL COSTS			
Land Use			
Hydrological and Water Use			
Terrestrial Biology			
Aquatic Biology			
Socioeconomic			
Other (specify)			