



U.S. NUCLEAR REGULATORY COMMISSION

ENVIRONMENTAL STANDARD REVIEW PLAN

3.8 TRANSPORTATION OF RADIOACTIVE MATERIALS

REVIEW RESPONSIBILITIES

Primary—Organization responsible for the review of transportation information

Secondary—None

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's review and analysis of the proposed means of transporting radioactive materials. The scope of the review directed by this plan will be limited to those design and operational parameters specified in 10 CFR 51.52(a).

Review Interfaces

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

- ESRP 3.2. Obtain input on the reactor type and rated core thermal power, the fuel assembly description, and the average irradiation level of irradiated fuel.
- ESRP 3.5. Obtain input on the treatment and packaging systems for radioactive waste.
- ESRP 5.7.2. Provide the reviewer for ESRP 5.7.2 with a description of the transportation of radioactive materials that addresses the packaging-related criteria listed in 10 CFR 51.52(a). If an independent analysis of the impacts of transportation is required, ensure that sufficient information to support an independent confirmatory analysis of these impacts is provided.
- ESRP 7.4. Provide the reviewer for ESRP 7.4 with a description of the transportation system for fuel and waste that addresses the criteria listed in 10 CFR 51.52(a). If an independent analysis

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

This Environmental Standard Review Plan 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.

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of the impacts of transportation accidents is required, ensure that sufficient information to support an independent confirmatory analysis of these impacts is provided.

Data and Information Needs

The type of data and information needed will be affected by site- and station-specific factors, and the degree of detail should be modified according to the anticipated magnitude of the potential impacts. The following data or information should be obtained:

- reactor type and rated core thermal power (from ESRP 3.2)
- fuel assembly description (from ESRP 3.2)
- average irradiation level of irradiated fuel (from ESRP 3.2)
- the capacity of the onsite storage facilities to store irradiated fuel and the minimum fuel storage time between removal from the reactor and transportation offsite (from the environmental report [ER])
- treatment and packaging procedures for radioactive wastes other than irradiated fuel (from the ER)
- description of the transportation packaging systems to be used for fresh fuel, irradiated fuel, and other radioactive wastes.
- estimated transportation distance from the fuel fabrication facility to the plant and from the plant to the facility to which irradiated fuel and radioactive wastes will most likely be sent, if applicable (from the ER).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the description of the transportation of radioactive materials are based on the relevant requirements of the following:

- 10 CFR 51.52 with respect to the design and operational parameters related to the transportation of fuel and waste to and from the reactor.

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

- There are no regulatory positions specific to this ESRP. Note, however, that the NRC has generically considered the environmental impacts of spent nuclear fuel with U-235 enrichment levels up to 5% and irradiation levels up to 62,000 megawatt-days per metric ton and found that

the environmental impacts of spent nuclear fuel transport are bounded by the impacts listed in Table S-4 provided that more than 5 years has elapsed between removal of the fuel from the reactor and shipment of the fuel offsite (NRC 1996; NRC 1999). However, these analyses cannot serve as the initial licensing basis for new reactors.

Technical Rationale

The technical rationale for evaluation of the applicant's proposed means for transporting radioactive materials is discussed in the following paragraph:

The proposed method for the transportation of fuel and radioactive wastes to and from the facility needs to be described so that impacts from transportation can be appropriately analyzed in other sections of the ESRP. The regulations in 10 CFR 51.52 give the environmental impacts that result, given a specific thermal power level in the reactor core, type of fuel, average irradiation of fuel, and specific parameters on packaging and shipping. Sufficient information should be provided in the ER to support the evaluation of transportation impacts in ESRPs 5.7.2 and 7.4. If the description of the transportation falls within the specific parameters given in paragraph (a) of 10 CFR 51.52, then Table S-4 can be used to determine the environmental impact; otherwise, further analysis is required. Thus, a description of the parameters surrounding the transportation of fuel and radioactive wastes is necessary.

III. REVIEW PROCEDURES

The reviewer's analysis of the data and information is required to support the reviewer's evaluation for conformance with 10 CFR 51.52(a) (see Evaluation Findings in this ESRP). The analysis should consist of assembling the data listed in the procedures below and verifying their accuracy. The reviewer may consult with the reviewers for ESRPs 3.2 and 3.5 to verify the data.

The reviewer should take the following steps:

(1) Prepare the following information about packaging and shipping parameters:

- onsite storage of irradiated fuel – information about the minimum time between removal from the reactor and shipment offsite
- radioactive wastes other than fuel – information about the form of packaged waste to be shipped offsite (The reviewer should consider the proposed solid waste treatment and packaging procedures in evaluating this criterion.)
- transport modes for new fuel shipment to the plant
- transport mode for irradiated fuel shipments offsite
- transport mode for other radioactive-waste shipments offsite
- average heat load for irradiated fuel casks in transit

- maximum gross vehicle weight for truck and rail shipments of unirradiated fuel, spent fuel, and other radioactive waste.

(2) Review the transportation analyses in ESRPs 5.7.2 and 7.4 to determine if they are solely a comparison to the reactor and transportation conditions in 10 CFR 51.52(a) or a full description and detailed analysis of the environmental effects of transportation of fuel and waste to and from the reactor. If the former, the review of this section is complete. If the latter, additional transportation parameters should be provided in this section to support a full and detailed analysis, including:

1. general description of packaging systems for unirradiated fuel, spent fuel, and waste (e.g., approximate dimensions, weight)
2. packaging system capacity
3. shipment mode and capacity
4. radiation dose rates for loaded packages
5. locations of fuel fabrication facilities and potential destinations for shipments of spent fuel and radioactive waste that will be used to determine shipping route information.

IV. EVALUATION FINDINGS

When the reviewer determines that the environmental impacts of transportation can be met by use of Table S-4, a brief input to the environmental impact statement (EIS) should be prepared summarizing the data of Section III, Item (1) of this ESRP. The input should note that these data are within the scope of 10 CFR 51.52(a), and that ESRPs 5.7.2 and 7.4 will address the impacts of radioactive-material transportation by reference to Table S-4 of 10 CFR 51.52(c). When Table S-4 cannot be used, the reviewer should provide, as input to the EIS, a description of those proposed designs or procedures that do not meet the criteria of Section III, Item (1) of this ESRP. This material should be provided in sufficient detail to support a subsequent impact assessment by the reviewers for ESRPs 5.4.2 and 7.4.

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 51.52, "Environmental effects of transportation of fuel and waste."

10 CFR 51.52, Table S-4, "Environmental Impact of Transportation of Fuel and Waste to and from One Light-Water-Cooled Nuclear Power Reactor."

U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 1999. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Main Report, Section 6.3—Transportation, Table 9.1 Summary of findings on NEPA issues for license renewal of nuclear power plants*. NUREG-1437 Vol. 1, Addendum 1, 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.
