

COMPLIANCE DETERMINATION STRATEGY

RR1003 ASSESSMENT OF COMPLIANCE WITH THE
GROUNDWATER PROTECTION REQUIREMENTS

PRIMARY REGULATORY CITATION:

10 CFR 60.112

PASS ID OF THE COMPLIANCE DETERMINATION STRATEGY:

RR1003/NS0001

TYPES OF REVIEW:

Acceptance Review (Type 1)
Safety Review (Type 3)

RATIONALES FOR TYPE OF REVIEW:

Acceptance Review (Type 1) Rationale:

This regulatory requirement is considered to be License Application-related because, as specified in the License Application content requirements of 10 CFR 60.21 and the Format and Content Regulatory Guide (NRC, 1990), it must be addressed by DOE in its license application. Therefore, the staff will conduct an Acceptance Review of the license application for this regulatory requirement.

Safety Review (Type 3) Rationale:

This regulatory requirement is related to radiological safety and waste isolation. It is a requirement for which compliance is necessary to make a safety determination for construction authorization as defined in 10 CFR 60.31 (i.e., regulatory requirements in Subparts E, G, H, I, and 10 CFR 60.21). Therefore, the staff will conduct a Safety Review of the license application to determine compliance with the regulatory elements of proof for this regulatory requirement.

The overall system performance requirement (10 CFR 60.112) stipulates that DOE provide, through tests, data, and analyses, reasonable assurance that the overall repository system (i.e., the geologic barrier provided by the site together with the engineered barriers incorporated in the system by design) will meet the "generally applicable standards for protection of the general environment from off-site releases from radioactive material in repositories" as set by the U.S. Environmental Protection Agency (EPA) in 40 CFR Part 191 (*Code of Federal Regulations*, Title 40, "Protection of the Environment"). This is the highest level of performance requirement on the geologic repository and DOE is expected to utilize great amounts of site characterization and design data, in addition to some subjective information obtained through expert elicitation, to show compliance with the total system performance requirement. DOE's compliance demonstration methods are expected to be based largely on predictive mathematical models

of varying complexity.

The ground-water protection portion of this total system requirement focuses on the radionuclide concentration in a "special source of ground water." A special source of ground water is defined in the EPA standard (EPA, 1985; 50 FR 38086) to be "those Class I ground waters ... that: (1) Are within the controlled area encompassing a disposal system or are less than five kilometers beyond the controlled area; (2) are supplying drinking water for thousands of persons as of the date that the [DOE] chooses a location within that area for detailed characterization as a potential site for a disposal system ...; and (3) are irreplaceable in that no reasonable alternative source of drinking water is available to that population." A draft report by Adrian Brown Consultants (1989) concludes that for the Yucca Mountain site, no special sources of ground water exist, because the aquifers within five kilometers of the controlled area do not presently supply drinking water to thousands of people. Therefore, given the lack of such special sources, this section of the EPA standard would not be applicable for the proposed site. The highest level of review this regulatory requirement will receive will be a Type 3 Safety Review.

The selection of a Type 3 Safety Review is dependent on the assumption that no special sources of ground water exist below or adjacent to the site. Should this assumption later be found to be incorrect, a higher level of review may be required for this regulatory requirement.

In addition, the current level of review is dependent on the retention of the term "special source of ground water" in the existing 1985 standard. It must be noted that, along with other changes, current drafts of the revised EPA standard delete use of this term from the proposed standards for ground water protection. If such revisions are promulgated, the level of review for this regulatory requirement may change.

REVIEW STRATEGY:

Acceptance Review (Type 1)

In conducting the acceptance review of the ground-water protection portion of the total system performance regulatory requirement (10 CFR 60.112), the reviewer will determine whether the information presented in the license application and its references for determining compliance with this regulatory requirement is complete in technical breadth and depth as identified in the Draft Regulatory Guide DG-3003 (NRC, 1990).

The information in the license application should be presented in such a manner that the assumptions, data, and logic leading to a demonstration of compliance with the requirement are clear and do not require the reviewer to conduct extensive analyses or literature searches. The review should also determine that controversial information and appropriate alternative interpretations and models have been adequately described and considered.

Finally, the reviewer shall determine if DOE has either resolved all the NRC staff objections to the SCP that apply to this requirement or provided

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all the information requested in Section 1.6 of DG-3003 for unresolved objections. The reviewer will evaluate the effects of any unresolved objections, both individually and in combinations with others on: (1) the reviewer's ability to conduct a meaningful and timely review, and (2) the Commission's ability to make a decision regarding construction authorization within the three-year statutory period.

Safety Review (Type 3)

In conducting the Safety Review, the reviewer will, at a minimum, determine the adequacy of the data and analyses presented in the license application to determine DOE's compliance with this regulatory requirement. Specifically, the review activities will consist of an assessment of DOE's demonstration regarding the existence of a special source of ground water below or adjacent to the site. This will involve evaluations of DOE's demonstration against each of the criteria under the definition of a "special source of ground water" in 40 CFR Part 191 (EPA, 1985; 50 FR 38086).

In general, the reviewer will assess the adequacy of the investigations concerning the ground-water protection requirements of 40 CFR Part 191. The specific aspects of the license application on which the reviewer will focus are discussed in DG-3003, and the acceptance criteria will be identified in Section 3 of this review plan.

In order to conduct effective Safety Reviews, the reviewers will rely on their expertise and independently-acquired knowledge, information, and data in addition to that provided by DOE in its license application. If it is determined that a special source of ground water does not exist at Yucca Mountain, then this regulatory requirement is not applicable for demonstrations of compliance with requirements of system performance after permanent closure. In contrast, if it is determined that a special source of ground water is present, then this regulatory requirement may require a more detailed type of review. The staff will need to conduct a review of the data and/or analyses to determine whether certain portions of the information should be subjected to further detailed review.

This Safety Review will also assure that: (1) all of the favorable conditions (10 CFR 60.122(b)) and potentially adverse conditions (10 CFR 60.122(c)), that have been determined to be present, are included in the compliance demonstration for this regulatory requirement; and (2) consideration of any potentially adverse condition that has been determined to be present will use assumptions that are not unlikely to underestimate its effects.

Contributing Analysts:

CNWRA: Budhi Sagar

NRC: Jim Park

Date of Analysis: September 8, 1992

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APPLICABLE REGULATORY ELEMENTS OF PROOF:

Type 3:

REOP

RR1003/EP0100

NOTE: This will change when: (1) 40 CFR Part 191 is finalized; (2) 10 CFR Part 60 is amended to conform it to 40 CFR Part 191; (3) the STF revises the RR-REOP structure.

REFERENCES:

Adrian Brown Consultants, "Draft Report: Ground Water Classification -- 'Significant' and 'Special' Sources and the Individual and Ground Water Protection Requirements of 40 CFR Part 191 at Yucca Mountain," Denver, Colorado, 891107ML.CLS, 1989.

Code of Federal Regulations, "Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes," Part 191, Chapter I, Title 40, "Protection of the Environment."

Nuclear Regulatory Commission, "Draft Regulatory Guide DG-3003: Format and Content For the License Application for the High-Level Waste Repository," Office of Nuclear Regulatory Research, DG-3003, November 1990.

U.S. Environmental Protection Agency, "Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes; Final Rule," *Federal Register*, vol. 50, No. 182, September 19, 1985, pp. 38066-38089.

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ATTACHMENT

COMPLIANCE DETERMINATION STRATEGY

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GROUNDWATER PROTECTION REQUIREMENTS

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REVISED PARAGRAPH PROVIDED BY FAX FROM M. LEE.

Contributing Analysts:

CNWRA: Budhi Sagar

NRC: Jim Park

Date of Analysis: September 8, 1992

APPLICABLE REGULATORY ELEMENTS OF PROOF:

Type 3:

REOP

RR1003/EP0100

TOPIC

-Presence of Special Source of Ground Water

NO TOPICS EXIST FOR REOP

10/10

NOTE: This will change when: (1) 40 CFR Part 191 is finalized; (2) 10 CFR Part 60 is amended to conform it to 40 CFR Part 191; (3) the STF revises the RR-REOP structure.

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