

Office of New Reactors
Interim Staff Guidance on Evaluation and Acceptance Criteria for 10 CFR 20.1406 to Support Design Certification and Combined License Applications

Purpose:

The purpose of this interim staff guidance (ISG) is to clarify the U.S. Nuclear Regulatory Commission (NRC) position on what is an acceptable level of detail and content required for an applicant to demonstrate compliance with Title 10 of the *Code of Federal Regulations* Section 20.1406 (10 CFR 20.1406 or the Rule). Regulatory Guide (RG) 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life Cycle Planning," describes an acceptable method of demonstrating compliance. This ISG provides further clarification on the evaluation and acceptance criteria that will be used by NRC staff in reaching a reasonable assurance finding that a Design Certification (DC) or Combined License (COL) applicant has complied with the requirements of 10 CFR 20.1406.

Background:

The minimization of contamination regulation, 10 CFR 20.1406, applies to all COL and DC applications submitted after August 20, 1997. The rule requires that applicants describe how they intend to minimize, to the extent practicable, the contamination of the facility, the contamination of the environment, and the generation of radioactive waste. Applicants are also required to describe how they will facilitate decommissioning. The intent of 10 CFR 20.1406, as evidenced by its placement in Subpart E of Part 20, "Radiological Criteria for License Termination," is to avoid creation of legacy sites by planning for decommissioning.

In response to current and future DC and COL applicants' need for guidance on 10 CFR 20.1406, NRC staff issued RG 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning," (ML080500187) in June of 2008. RG 4.21 (previously issued for public comment as Draft Guide 4012), describes a basis acceptable to the staff for implementing the requirements of 10 CFR 20.1406. This includes a discussion of high level objectives as well as specific actions that can be taken during design, construction, operation, and decommissioning to ensure that, to the extent practicable, contamination of the facility and the environment is minimized, radioactive waste generation is minimized, and decommissioning is facilitated.

Issue:

Pursuant to 10 CFR 20.1406, DC and COL applicants must describe in their applications how they intend to minimize contamination, minimize the generation of radioactive waste, and facilitate decommissioning. In order to meet these requirements, the NRC has provided guidance for applicants to follow in RG 4.21. If this guidance is not followed, the applicant must fully describe the alternate method used and provide sufficient details such that the NRC staff will have enough information to conduct its review.

Enclosure

Regardless of the applicant's methodology, NRC staff typically rely on the evaluation and acceptance criteria found in NUREG-0800 (Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants), to verify the applicant's compliance with 10 CFR 20.1406. These criteria are of particular importance due to the cross-cutting, performance-based nature of both 10 CFR 20.1406 and RG 4.21. However, at this time, the criteria described in NUREG-0800 are not adequate to cover the full scope of the regulation, nor are they adequate to establish minimum level-of-detail requirements for the content of applications. As a result, NRC staff has issued this ISG to supplement NUREG-0800 and application guidance until updated versions are available.

Proposed Interim Staff Guidance:

Evaluation Criteria

Applicants for DCs and COLs must meet the criteria of 10 CFR 20.1406 for minimization of contamination. This is accomplished by considering the design features and operation of structures, systems, and components (SSCs) that contain or handle radioactive material as described in a COL applicant's final safety analysis report, or in a DC application. If a COL application references a standard DC that meets the criteria of 10 CFR 20.1406 for design features, then the COL applicant needs to only consider requirements affecting operation and site-specific features.

At a minimum, as part of the description of design and operational features for all applicable SSCs, the applicant should also describe plans for: limiting leakage, controlling the spread of contamination, detecting leaks early, allowing for appropriate and timely action by the future licensee, and providing for safe and efficient decommissioning. Where appropriate to the type of SSC being considered, the applicant should explicitly describe how these considerations have been applied to the design and operation of the SSC.

Regulatory positions C.1 through C.4 in RG 4.21 have been provided as specific guidance to applicants on meeting the criteria of 10 CFR 20.1406. C1 through C4 describe concepts to be implemented to provide reasonable assurance that inadvertent spills, leaks, and discharges of liquid, gaseous and solid radioactive effluents are prevented, detected and corrected, that the site is adequately characterized and understood, that decommissioning is planned for and that the generation of radioactive waste is minimized. The measures to be taken by the applicant should be risk-informed and the examples described in RG 4.21, Appendix A should be used by the applicants to determine which measures are applicable. However, this listing is not intended to be used as a checklist of minimally acceptable design or operational features. Alternative methods may be acceptable to meet the criteria of 10 CFR 20.1406 provided the methods are documented fully in the DC or the COL applications.

Additionally, the applicant should document that if a spill, leak, or inadvertent discharge were to occur, design or operational features ensure that the spill, leak, or discharge will be detected promptly, and monitored and evaluated to determine the impact on the environment.

Acceptance Criteria

To determine an applicant's compliance with 20.1406, the staff should therefore review the applicant's description of all applicable SSCs and applicable site-specific data to confirm that:

- Adequate design features exist, supplemented with operating programs, processes and procedures (as necessary), and these will provide reasonable assurance that spills, leaks, and inadvertent discharges of radioactive effluents will be prevented or minimized.
- In the event the spill, leak, or inadvertent discharge does occur, the staff should verify that there is reasonable assurance that it will be detected in a timely manner. Leak detection capability should allow for the identification and measurement of relatively small leak rates (*e.g.*, several gallons per week), for those SSCs that are typically inaccessible for routine inspection or observation.
- Design features should be supplemented, as necessary, by operating programs, processes and procedures to monitor spills and leaks and evaluate their impact to the environment.
- The site has been adequately characterized and conceptual site models have been developed which define the site hydrogeological setting and covering subsurface and surface migration pathways under both pre-construction and post-construction conditions. These models are needed to assist with designing monitoring components and procedures, designing protective measures, carrying out remediation, and designing decommissioning activities.
- Design features to facilitate decommissioning should be included, and their role in the decommissioning process should be described.

Final Resolution:

In the near-term, the issue will be resolved in upcoming updates of RG 1.206, "Combined License Applications for Nuclear Power Plants," NUREG-0800, and other affected guidance documents. Potentially affected sections of these documents include those parts dealing with site characteristics, plant systems, waste management, and radiation protection (*e.g.*, final safety analysis report chapters 2, 9, 10, 11, 12, and 13). The NRC staff is specifically requesting comments on the organization of the information related to 10 CFR 20.1406 within DC and COL applications and the related organization of the NRC guidance documents.

After resolution of public comments, DC/COL-ISG-006 will be issued in final form and its contents will subsequently be incorporated into the appropriate sections of the SRP and RG 1.206.

The NRC staff notes that the industry is developing a template (NEI-08-08) that is intended to assist DC and COL applicants. The industry and NRC staff efforts are being coordinated to ensure consistent guidance is being provided to applicants and that the guidance supports preparation and subsequent NRC staff review of applications.

Applicability:

This ISG is applicable to all DC and COL applications submitted under 10 CFR Part 52. This ISG shall be implemented on the day following its approval. It shall remain in effect until it has been superseded, withdrawn, or incorporated into a revision of the SRP and RG 1.206.

References:

1. 10 CFR Part 20.1406, "Minimization of Contamination"
2. RG 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning"