

Revision 1 to the Standard Review Plan for the Review of a
License Application for a Fuel Cycle Facility (NUREG-1520)

Thursday, October 8, 2009
Washington DC
Public Meeting

Agenda

- NRC & NEI Opening Remarks
- Discussions on the proposed changes to NUREG-1520 – NRC
 - General Changes
 - Changes to the Introduction & General Chapters
 - Changes to Technical chapters
 - Changes to Chapter 3, ISA & ISA Summary
- Questions

Opening Remarks

Change Summary

- Improve linkage of review content to regulatory requirements
- Incorporate Interim Staff Guidance positions and update references
- Incorporate Lessons Learned from licensing experience and provide technical clarifications
- Added a new subsection: “Review Interfaces”
- Reformatting of chapters for consistency with NUREG format
- Added additional guidance, clarification, and references for meeting regulatory requirements
- Removal of redundant and vague guidance, non-requirements and commitments to follow the regulations

Introduction

- NUREG-1520 Applicability
- This guidance is specific to fuel cycle facilities regulated under Title 10 of the Code of Federal Regulations Part 70 (10 CFR Part 70), that is, facilities that are authorized or are seeking for a license to possess and use more than a critical mass of SNM. This guidance does not apply to conversion facilities^[1], gaseous diffusion plants (GDPs)^[2], reprocessing facilities and plutonium processing facilities^[3]
 - ^[1] Conversion facilities are regulated under the provisions of 10 CFR Part 40, Domestic Licensing of Source Material.
 - ^[2] Gaseous Diffusion Plants are regulated under 10 CFR Part 76, Certification of Gaseous Diffusion Plants. 10 CFR Part 76, specifically apply to those portions of the Portsmouth and Paducah Gaseous Diffusion Plants located in Piketon, Ohio, and Paducah, Kentucky, respectively, that are leased by the United States Enrichment Corporation.
 - ^[3] Guidance to review license application for a Mixed Oxide (MOX) Fuel Fabrication Facility is provided in NUREG-1718, “Standard Review Plan for the Review of a License Application for a MOX Fuel Fabrication Facility”, Level of Detail

Introduction

- **IROFS Boundary Package Definition**

- Documents that contain the physical descriptions and parameters of structures, systems, components which are used to meet the performance requirements of 10 CFR 70.61. Boundary packages are also prepared for administrative procedures or worker actions which are defined as IROFS. The boundary packages identify the specific functions to be performed by an IROFS and identify any items that may affect the function of the IROFS. The boundary packages also identify the facility areas in which the IROFS is used, design and functional attributes, management measures, any open items, and supporting documentation (i.e., P&IDs, schematics, etc.).
- Design and functional attributes should include safety functions such as separation from other IROFS; redundancy and diversity; fail-safe design; setpoints; environmental qualification; seismic qualification; and fire protection. Also included under design and functional attributes should be system interfaces such as instrumentation, electrical, cooling, and lubrication requirements.

Introduction

- **IROFS Boundary Package Definition (cont.)**
 - Management measures should address all of the management measures required to be applied to IROFS as per 10 CFR 70.4 and include summary descriptions and/or references to maintenance, training, and procedures documents as appropriate for the IROFS. The references should be adequate to identify the actual working level training or procedures document.
 - Open items which affect reliability and/or effectiveness of the IROFS should be closed by the time of the ORR. The open items section should identify open items associated with the IROFS during the review and describe how the open items were resolved.

Introduction

- IROFS boundary definition packages
 - In order to facilitate the planning and accomplishment of a risk-informed ORR, the staff relies upon the licensee to provide a complete set of information concerning items relied upon for safety (IROFS). This information is referred to as IROFS boundary definition packages. This information is not required to be submitted with the license application or the ISA Summary, however, having this information before the ORR inspection can greatly reduce the inspection planning period.

Introduction

- Level of Detail
 - The level of detail required for a licensing decision does not require a final facility design, however identification of all items relied on for safety (IROFS) and possible accident sequences is necessary to make a licensing decision
 - Even though detailed information about each IROFS is not required, sufficient information has to be provided to understand the process, theory of operation, and functions of each IROFS and reasonable assurance that the integrated safety analysis summary is complete.

Chapter 1, General Information, & Chapter 2, Organization and Administration

- Revisions to Chapter 1 and Chapter 2 were minor
 - Information regarding supporting organizations in the review of Section 1.2 was updated.
 - Added language under “financial qualifications” clarifying the acceptance criteria for applications for new facilities.

Chapter 4: Radiation Safety

- Revisions to Chapter 4 include:
 - Addition of Section 4.4.8 “Control of Radiological Risk Resulting from Accidents”
 - Addresses the need for additional clarification regarding ISA Summary review
 - Formally incorporate draft ISG-2 (Accident Sequences That Result in Consequences Below 10 CFR 70.61 Performance Requirements) relevant to RP

Section 4.4.8

- In addition to participating in the integrated review of the ISA summary performed in accordance with Chapter 3 of the SRP, the reviewer should also examine in detail the radiological exposure and/or release accident sequences provided in the ISA summary to demonstrate compliance with 10 CFR 70.61. This review should include an evaluation of sequences involving radiological releases or exposures with respect to the initiators and their frequency, radiological consequences, and IROFS chosen to prevent or mitigate those consequences.
- The reviewer should also identify and note any items or issues that should be inspected during an operational readiness review, if such will be performed. These items may include confirming that engineered controls meet performance specifications described in the ISA summary and that administrative controls are implemented through procedures and operator training.
- The reviewer should ensure that the emergency plan, if one is required, adequately addresses the licensee response to a release of radioactive materials or else that proper justification is present to preclude development of an emergency plan.
- Finally, the reviewer should be aware that accident sequences considered “not unlikely” in the ISA summary are constricted under the 10 CFR Part 20 ALARA requirement to minimize exposure to personnel and the public.

Section 4.4.8 Acceptance Criteria

The factors listed below should be considered in determining the acceptability of the applicant's descriptions of radiological exposure or release accident sequences. The checklist in Appendix 4 has been developed to provide guidance on those items that reviewers should consider when evaluating the completeness of the ISA for radiological risks.

- Accident sequences should be sufficiently described and detailed to allow an understanding of the radiological hazards (e.g., radioactive materials at risk) and the release mechanism.
- The applicant should provide adequate descriptions of the radiological consequences (i.e., exposure estimates) identified in the ISA summary. The reviewer should verify that exposures are reasonable based on the sequence description and the radioactive materials involved and use a methodology consistent with regulatory guidance (10 CFR 70.61).
- The applicant should justify the likelihood of the initiating event, its prevention, or consequence mitigation of an accident sequence with high or intermediate consequences if credited in a questionable or nonconservative manner. If controls are relied on to reduce the likelihood or severity of a high- or intermediate-consequence accident sequence, they should be identified as IROFS (10 CFR 70.61).
- Analyses that the applicant has performed as part of the ISA process should be referenced or identified for potential further review (vertical slice) by the NRC staff (10 CFR 70.61).
- The application should demonstrate the management measures proposed to ensure that IROFS are available and reliable when required by briefly describing both of the following:
 - procedures to ensure the reliable operation of engineered controls (e.g., inspection and testing procedures and frequencies, calibration programs, functional tests, corrective and preventive maintenance programs, and criteria for acceptable test results) [10 CFR 70.62(d)]
 - procedures to ensure that administrative controls will be correctly implemented when required (e.g., employee training and qualification in operating procedures, refresher training, safe work practices, development of standard operating procedures, and training program evaluations) [10 CFR 70.62(d)]
- The application shall include either of the following:
 - an evaluation that demonstrates public exposures resulting from offsite releases of material are less than 1 rem or 2 milligrams soluble uranium intake
 - an emergency plan that includes sufficient detail for responding appropriately to an offsite release of radioactive materials (10 CFR 70.22(i)(1))

Chapter 5: Criticality

- Revisions to Chapter 5 include
 - Expanded discussions of Nuclear Criticality Safety Program, code validation, technical practices and use of standards
 - Provided additional guidance for Safety Program review
 - Provided additional pointers to other SRP chapters for guidance for interacting with other technical disciplines
 - Provided reference to discussions on level of detail, (Chapter 3) and the reasonable assurance standard and the role of the ORR. (introduction)
 - Incorporated ISG-03: Nuclear Criticality Safety Performance Requirements, and description of Double Contingency Principle

Chapter 6: Chemical Safety

- Revisions to Chapter 6 include:
 - Clarification/reference of regulatory requirements to review content.
 - The areas of review were divided in the following subsections:
 - Chemical process description
 - Chemical accident sequences
 - Chemical accident consequences
 - Chemical process IROFS and sole IROFS
 - Chemical process management measures

Chapter 7: Fire Safety

- Revisions to Chapter 7 include:
 - Addition of a subsection to section 7.4.3.2 regarding deviations from NFPA codes and standards and added clarification concerning the “authority having jurisdiction” (AHJ).
 - Section 7.4.3.3 rewritten to incorporate a listing of specific information likely to be required for the staff to review the fire safety aspects of the facility design.
 - Section 7.4.3.4 modified to include criteria for ISA review of fire initiated accident sequences and associated IROFS and management measures.
 - Added wording to provide example findings to reflect wording of recent staff SERs.

Chapter 9: Environmental Protection

- Revisions to Chapter 9 include:
 - Removal of almost all details about NEPA reviews and preparation of EAs and EISs since they are addressed in detail in NUREG-1748, Environmental Review Guidance for Licensing Actions Associated with NMSS Programs.
 - Added more detailed language for different categorical exclusions that we use most often.

Chapter 10: Decommissioning

- Revisions to Chapter 10 include:
 - Addition of information regarding conceptual decontamination plan, decommissioning costs and financial assurance.
 - Addition of information regarding record keeping requirements.

Chapter 11: Management Measures

- Revisions to Chapter 11 were minor:
 - Section 11.2 was updated to reflect current practices for assignment of responsibility for review.
 - Sections 11.3 and 11.4 were updated for internal consistency
 - Added additional information for new facilities.

Break

Chapter 3: ISA & ISA Summary

- Revisions to Chapter 3 include:
 - Provided additional guidance more directly applicable for licensing of new facilities, as opposed to facilities that were constructed/licensed prior to the Subpart H revision of 10 CFR 70 requiring ISAs (current version of NUREG-1520 is focused primarily on existing facilities).
 - Provided additional guidance on the extent to which the review and approval is programmatic, as opposed to a design review.
 - 10^{-4} in a few places was a typographical error.

Chapter 3: ISA & ISA Summary (cont'd)

- Provided additional guidance on what constitutes an acceptable “level-of-detail” for descriptions of facility processes and Items Relied on for Safety, sufficient for licensing approval.

“For an applicant seeking a license before commencing construction of a facility, full details concerning hardware, procedures, and programs usually would not exist. However, at the time of the operational readiness review^[1] for a new facility, or major modifications to an existing facility, such details must exist to comply with the safety program requirements of 10 CFR 70 Subpart H,The level of detail that is acceptable in a license application and ISA Summary does not differ between existing and new facilities.”

Chap. 3 ISA (cont'd)

- Level-of-detail (cont'd)

“10 CFR 70.65(b) ..integrated safety analysis summary...

(6) A list briefly describing each item relied on for safety which is identified pursuant to §70.61(e) in sufficient detail to understand their functions in relation to the performance requirements of §70.61.”

SRP page 3-8: “The requisite level of detail to achieve reasonable assurance may vary among processes depending on factors such as: use of established technology, commitment to standards, applicant expertise, safety margins, and inherent difficulty in achieving the safety function.”

Chap. 3 ISA (cont'd)

- Extent to which review is programmatic
SRP page 3-8: “It should be noted that the purpose of the review, and its acceptance criteria, for most facilities, is primarily to permit a finding that the applicant’s safety program, including the ISA program as described, provide reasonable assurance that compliance will be achieved.”

Chap. 3 ISA

- Programmatic Review

However, see p. 3-32 on vertical slice reviews. These necessarily examine compliance for particular processes and IROFS in detail.

List of IROFS must be complete.

Chapter 3: ISA (cont'd)

- Provide additional guidance on acceptable methods of evaluating likelihood. Consists of previously developed Interim Staff Guidance:
 - Annex to Appendix A: Use of Appendix A Risk Index Methodology
 - Appendix B: Qualitative Criteria for Evaluation of Likelihood(ISG-1)
 - Appendix C: Initiating Event Frequency (ISG-9)

Chapter 3: ISA & ISA Summary (cont'd)

- New Appendices incorporate ISGs exactly as previously published:
 - Annex to Appendix A: Use of Appendix A Risk Index Methodology
 - Appendix B: Qualitative Criteria for Evaluation of Likelihood (ISG-1)
 - Appendix C: Initiating Event Frequency (ISG-9)
 - Appendix D: Natural Phenomena Hazards (ISG-8)
 - Annex to Appendix D: Example of Natural Phenomena Hazard Review for Compliance with 10 CFR 70.61.

Summary

- No new technical positions
- No new staff positions
- Better linkage between review sections and the regulations
- Incorporates previously established Interim Staff Guidance positions

Schedule

- Comment Period Ends: October 24, 2009.
- Comment Resolution: December 2009
- ACRS Briefings: November & December 2009.
- Final SRP Publication: April 2010

WebPages

- Web pages
 - Proposed revision available in the Agencywide Documents Access and Management System (ADAMS):
<http://www.nrc.gov/reading-rm/adams.html>
 - Draft is available in the Public Website “Draft NUREG-Series Publications for Comments” <http://www.nrc.gov/reading-rm/doc-collections/nuregs/docs4comment.html>
 - NUREG1520 Website: <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1520/>

Questions?