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REGULATORY GUIDE

OFFICE OF NUCLEAR REGULATORY RESEARCH

REGULATORY GUIDE 3.50
(Task CE 402-4)

STANDARD FORMAT AND CONTENT FOR A LICENSE APPLICATION TO STORE SPENT FUEL AND HIGH-LEVEL RADIOACTIVE WASTE

TABLE OF CONTENTS

INTRODUCTION

Subpart B, "License Application, Form, and Contents," of 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste," specifies the information to be covered in an application for a license to store spent fuel in an independent spent fuel storage installation (ISFSI) or to store spent fuel and high-level radioactive waste in a monitored retrievable storage facility (MRS). However, Part 72 does not specify the format to be followed in the license application. This regulatory guide suggests a format acceptable to the NRC staff for submitting the information specified in Part 72 for a license application to store spent fuel in an ISFSI or to store spent fuel and high-level radioactive waste in an MRS.

The need for this revision of Regulatory Guide 3.50 arose from changes made to 10 CFR Part 72. The final rule was published on August 19, 1988 (53 FR 21651) and became effective September 19, 1988.

Part 72 provides for a single-step licensing procedure. The smooth functioning of this one-step licensing procedure requires that the license application be essentially complete when it is initially submitted. Thus, the final design details of those ISFSI or MRS components, systems, and structures that are important to safety should be made available for review and evaluation with submittal of the license application. Part 72 also requires that a site evaluation be provided to ensure that the natural characteristics of the site and its environs are sufficiently known and have been factored into the engineering design of the installation. The document in which this information is presented is a safety analysis report (SAR).

Although an applicant may plan to contract with another organization for the design, construction, and possibly the operation of the proposed ISFSI or MRS, a licensee under Part 72 cannot delegate to a contractor the responsibility for meeting applicable regulatory requirements. This means that the applicant must make a commitment that, as the licensee, it will have an adequate staff to ensure that regulatory requirements are met at each stage of the proposed project. If the applicant plans to contract with another organization for the operation of the proposed ISFSI or MRS, the contractual arrangements must be described in the license application. Any subsequent changes in such contractual arrangements may require an amendment to the application.

This regulatory guide represents a standard format that is acceptable to the NRC staff for the license application. Conformance with this guide, however, is not mandatory. License applications with different formats will be acceptable to the NRC staff if they provide an adequate basis for the findings required for the issuance of a license. However, because it may be more difficult to locate needed information, the staff review time may be longer, and there is a greater likelihood that the staff may regard the license application as incomplete.

As experience is gained in the licensing of spent fuel and high-level radioactive waste storage, the Commission's requirements for information needed in its review of applications for licenses to store radioactive material in an ISFSI or MRS may change. Revisions of the Commission's needs for information in connection with such licensing actions will be conveyed to the industry and the public by (1) amendments to NRC regulations, (2) revisions to this regulatory guide, (3) issuance of new or revised regulatory guides, and (4) direct communications, as needed, with the applicant by the NRC staff.

Prospective applicants are encouraged to meet with representatives of the Fuel Cycle Safety Branch, Division of Industrial and Medical Nuclear Safety, Office of Nuclear Material Safety and Safeguards, during the development of a license application to resolve any problems that may arise. An early resolution of potential problems is beneficial to all concerned with the licensing process.

Any information collection activities mentioned in this regulatory guide are contained as requirements in 10 CFR Part 72, which provides the regulatory basis for this guide. The information collection requirements in 10 CFR Part 72 have been cleared under OMB Clearance No. 3150-0132.

Contents of the License Application

The license application is the basic document that must address each of the requirements of Part 72 and must be complete in itself. The following should be submitted as separate documents as enclosures to the license application. The contents of each should be briefly summarized in the license application.

1. Safety Analysis Report
2. Decommissioning Plan
3. Emergency Plan
4. Environmental Report
5. Quality Assurance Program
6. Physical Security Plan (including guard training)
7. Safeguards Contingency Plan
8. Personnel Training Program
9. Proposed License Conditions, including Technical Specifications
10. Design for Physical Security

Format and Style

The applicant should strive for clear, concise presentation of the information provided in the application.

Abbreviations should be consistent throughout the license application and its enclosures. Any abbreviations, symbols, or special terms unique to the proposed activity or not in general use should be defined when they first appear.

A title page identifying key individuals responsible for the preparation of the license application and the oath or affirmation as required by paragraph 72.16(b) should be included. A table of contents should also be included.

Physical Specifications

1. Paper size: 8½ x 11 inches

2. Paper stock and ink. Suitable quality in substance, paper color, and ink density for handling and reproduction by microfilming or image-copying equipment.

3. Paper margins. A margin of no less than 1 inch should be maintained on the top, bottom, and binding side of all pages.

4. Printing

a. Composition: Text should be single or 1½ spaced.
b. Type face and style: Suitable for microfilming or image-copying equipment.
c. Reproduction: Either mechanical or photographic. Text should be printed on both sides of the paper with the image printed head to head.

5. Binding. Pages should be punched for a standard 3-hole loose-leaf binder.

6. Chapter and page numbering. Each requirement of the regulation addressed should be shown as a separate chapter with the same number as the chapter given in this guide, e.g., Chapter 7, "Operator Training." Pages should be numbered sequentially in each chapter, e.g., 7-1, 7-2, etc. Do not number the entire document sequentially.

Procedures for Updating or Revising Pages

All pages submitted to update, revise, or add to the license application should show the date of change and a change or amendment number. The changed or revised portion of each page should be highlighted by a "change indicator" mark consisting of a bold vertical line drawn in the margin opposite the binding side.

Referenced Materials

Caution should be used in references to information previously filed with the NRC. Such references must be pertinent to the subject discussed, must contain current information, and must be readily obtainable or extractable from the referenced documents. It may be more efficient in some cases to repeat, or at least summarize, information furnished in the previously submitted document.

1. GENERAL AND FINANCIAL INFORMATION

The license application should address the requirements of § 72.22, "Contents of Application: General and Financial Information," of 10 CFR Part 72 regarding details on the identity of an applicant. If the applicant is other than the owner and planned operator of the proposed independent spent fuel storage installation (ISFSI) or monitored retrievable storage facility (MRS), details of the working and contractual arrangements between all parties involved should be set forth. Any information on such matters considered as proprietary information by the applicant should be identified and submitted under separate cover. The procedures in paragraph 2.790(b) of 10 CFR Part 2 should be followed for such information.

If the proposed ISFSI or MRS is to be built on the site of another licensed activity or facility such as a nuclear power plant, details of the working arrangements and responsibilities of the licensees involved should be stated. Similarly, if unlicensed activities are carried out at the proposed site, any potential interactions between the proposed ISFSI or MRS and these other site activities should be explained.

Paragraph 72.22(e) specifically addresses the required financial information that must be submitted with the application. If the applicant is a corporation organized for the specific purpose of owning and operating the proposed ISFSI, details of its organizational structure, including the responsibilities of its members to meet the financial requirements of the proposed ISFSI throughout its proposed operating life and ultimate decommissioning, must be stated. This requirement is applicable even if the proposed ISFSI is to be owned and operated by a consortium of utilities.

2. TECHNICAL QUALIFICATIONS

Paragraph 72.40(a)(4) requires a finding by the NRC that the applicant is qualified by training and experience to operate an ISFSI or MRS. Section 72.28, "Contents of Application: Applicant's Technical Qualifications," sets forth information that must be included in the application for this purpose.

Although spent fuel storage in an ISFSI or spent fuel and high-level radioactive waste storage in an MRS is generally considered a relatively low-risk operation compared to some other types of nuclear activities, the design, construction, and operation of an ISFSI or MRS require certain skills and an understanding of the requirements involved to ensure that the objective of a relatively low-risk operation is achieved in practice. The license application should contain a commitment that the applicant will staff the project with an adequate cadre of personnel possessing the required skills throughout all phases of the project.

The licensee is responsible for the execution of the proposed project as described in the license application. This means that, even though much of the actual work involved during the site selection, design, procurement, construction, and even the operating phases of the project may be performed by a contractor, the licensee must have a staff that is knowledgeable in all aspects of the project. If such a staff does not actually exist, the applicant should describe the staffing plans in sufficient detail to support the finding required by paragraph 72.40(a)(4).

3. TECHNICAL INFORMATION -- SAFETY ANALYSIS REPORT

As required by § 72.24, "Contents of Application: Technical Information," the technical information is presented in the safety analysis report (SAR), which should be submitted as an enclosure to the license application. A summary statement identifying the type of installation proposed (e.g., a water-basin ISFSI, a storage-cask MRS), its design capacity, any unique features incorporated in its design, and its mode of operation is adequate for the license application document.

The SAR required for an ISFSI or MRS differs from the SARs for some other nuclear facilities in that the initial SAR is expected to be complete and comparable in scope and detail to the final SAR for facilities licensed under 10 CFR Part 50. Section 72.24 identifies the minimum information that is required to be included in the SAR. Although § 72.70 provides for the subsequent updating of the SAR, such changes during the design and construction phases of the project are expected to be of minor importance. Any of these changes deemed significant by the NRC staff may cause delay in the granting of the final clearance to receive spent fuel or high-level radioactive waste.

Guidance on the preparation of the SAR for an ISFSI of the water-basin type is contained in Regulatory Guide 3.44, "Standard Format and Content for the Safety Analysis Report for an Independent Spent Fuel Storage Installation (Water-Basin Type)." For the dry storage ISFSI that is not colocated at another nuclear facility site or for a dry storage MRS, guidance on the preparation of the SAR is being developed in the proposed Revision 1 to Regulatory Guide 3.48, "Standard Format and Content for the Safety Analysis Report for an Independent Spent Fuel Storage Installation or Monitored Retrievable Storage Installation (Dry Storage)." Guidance for preparing the SAR for the use of dry storage casks at the site of another nuclear facility is contained in Regulatory Guide 3.62, "Standard Format and Content for the Safety Analysis Report for Onsite Storage of Spent Fuel Storage Casks."

4. CONFORMITY TO GENERAL DESIGN CRITERIA

Subpart F of 10 CFR Part 72 contains the general design criteria for an ISFSI or MRS. The subject of conformity to the general design criteria is discussed in detail in the SAR. It is sufficient that the license application contain a summary discussion of each criterion and reference where more detailed information on a specific subject can be found in the SAR.

5. OPERATING PROCEDURES -- ADMINISTRATIVE AND MANAGEMENT CONTROLS

Paragraph 72.40(a)(5), "Issuance of License," requires a finding by the staff that the applicant's proposed operating procedures to protect health and to minimize danger to life or property are adequate. Essential to these operating procedures are the applicant's proposed administrative and management controls. Guidance on this subject is available in ANSI N299-1976, "Administrative and Managerial Control for the Operation of Nuclear Fuel Reprocessing Plants."* Although ANSI N299-1976 is designed for the much more complex operating requirements of a fuel reprocessing plant, the basic principles set forth for administrative and managerial controls are considered applicable to the operation of an ISFSI or MRS.

If the proposed ISFSI or MRS is to be operated by the owner, a relatively brief explanation of how ANSI N299-1976 will be followed may be adequate. However, if the proposed ISFSI or MRS is to be operated by a contractor, considerable detail may be required on the working arrangements between the parties involved. Particular attention should be placed on the description of the administration of the Independent Review and Audit Program that is identified in ANSI N299-1976.

*Copies may be obtained from the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.

6. QUALITY ASSURANCE PROGRAM

The quality assurance (QA) program required by Subpart G of Part 72 must be submitted as an enclosure to the application and is briefly described in Chapter 11 of the SAR. It is sufficient that the license application contain a commitment that the QA program described is (or will be) understood by all involved in its execution and that the program will be implemented, as applicable, for all phases of the project, including any activities important to safety that have been carried out prior to submittal of the license application.

This program should cover the engineering aspects of the site investigation, facility design, procurement, shop fabrication, onsite construction, preoperational testing, conduct of operations, and ultimate decommissioning. The emphasis of this program should be on those activities and items that are identified as being important to safety. The planned QA effort should be commensurate with the importance to safety of the identified activities and items.

A QA program that has been approved by the NRC as meeting Appendix B to 10 CFR Part 50 or Subpart G of 10 CFR Part 72 may be applied to the spent fuel storage system.* The applicant should state the intent to implement this QA program for the ISFSI or MRS, the date on which the QA program was submitted to the NRC, the docket number, and the date of NRC approval.

*Note that 10 CFR 72.140(d) states "A Commission-approved quality assurance program which satisfies the applicable criteria of Appendix B to Part 50 of this chapter and which is established, maintained, and executed with regard to an ISFSI will be accepted as satisfying the requirements of paragraph (b) of this section."

7. OPERATOR TRAINING

Subpart I, "Training and Certification of Personnel," of 10 CFR Part 72 requires that a personnel training program be established and that the program be submitted for NRC approval. A brief summary of the program should be included in the application. Applicants who have an approved training program in effect may modify this program to cover spent fuel storage operations. A description of the proposed changes should be provided.

ISFSI and MRS operators are not required to be licensed. However, they must have successfully completed an established training program. Appropriate documentation of training activities and certifications of proficiency should be included in the ISFSI or MRS records.

In addition to the specific operating requirements of the planned facility, the training program should include the nuclear engineering principles, NRC regulations, regulatory guides, and national standards applicable to ISFSI or MRS operations. Information on the content of the required training program is available from the Fuel Cycle Safety Branch, Division of Industrial and Medical Nuclear Safety, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

8. INVENTORY AND RECORDS REQUIREMENTS

A description of the inventory and records system for the stored spent fuel and high-level radioactive waste should be included in the license application. Section 72.72 identifies the inventory and record requirements for radioactive material stored at an ISFSI or MRS. The records on the identity of each fuel assembly or high-level radioactive waste container should be complete. As a minimum, these records should include:

1. For Spent Fuel

   a. Fuel manufacturer,
   b. Date of manufacture,
   c. Reactor exposure history,
   d. Burnup,
   e. Calculated special nuclear material content,
   f. Inventory control number,
   g. Pertinent data on discharge and storage at the reactor, transfer to the ISFSI or MRS, and storage at the ISFSI or MRS,
   h. For consolidated spent fuel, the records should show how the fuel rods can be traced to the original fuel assembly.

2. For High-Level Radioactive Waste

   a. Origin of waste,
   b. Calculations of isotope and curie content whenever they are necessary,
   c. Waste form,
   d. Thermal output,
   e. Inventory control number,
   f. Pertinent data on waste stabilization operations, transfer to the MRS, and storage at the MRS.

9. PHYSICAL PROTECTION

Subpart H, "Physical Protection," of 10 CFR Part 72 requires that a physical security plan and guard training plan (§ 72.180), a design for physical protection (§ 72.182), and a safeguards contingency plan (§ 72.184) be submitted. Since the details of the provisions for physical protection are withheld from public disclosure, these reports should be submitted separately. The license application should contain only a reference to the identity of the reports and when they were submitted.

Specific guidance on these submittals for an MRS or an ISFSI not located on a nuclear power reactor site may be obtained from the Safeguards Licensing Branch, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Reactor licensees may obtain guidance on these topics from the Reactor Safeguards Branch, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

If the applicant has a physical security plan and a safeguards contingency plan that have been approved by NRC, modifications may be made to cover spent fuel storage operations. A description of, and a schedule for, changes related to the spent fuel storage installation should be provided.

10. DECOMMISSIONING PLAN

Section 72.30, "Decommissioning Planning, Including Financing and Record-keeping," requires submittal of a proposed decommissioning plan, including a proposed funding plan that contains information on how funds will be available to decommission the ISFSI or MRS. The application should contain a description of the practices and procedures for decommissioning and an explanation of how the costs of decommissioning will be financed. Applicants who have previously submitted proposed decommissioning plans (i.e., nuclear power reactor licensees) may show how these plans will include the spent fuel storage installation.

11. EMERGENCY PLAN

The applicant should submit a plan for coping with emergencies as a separate document. If the ISFSI is located on the site of a nuclear power reactor, the emergency plan required by § 50.47 of 10 CFR Part 50 satisfies the requirements of § 72.32 of 10 CFR Part 72.

12. ENVIRONMENTAL REPORT

Section 72.34 requires that an environmental report be provided as part of the license application. Guidance on the format and content of an environmental report for an ISFSI may be found in Subpart A of 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

In the interest of keeping the size of this report within reasonable bounds and its structure and language keyed to the general public, it is recommended that a prospective applicant confer with the NRC staff to obtain definitive guidance on the scope and content of this report.

13. PROPOSED LICENSE CONDITIONS

License conditions proposed by an applicant constitute a commitment by the applicant to take the actions specified therein. License conditions can be considered in two broad categories: (1) administrative and management organization and controls and (2) technical specifications. Those addressing administrative and management subjects should be included in the license application; those addressing technical specifications should be described briefly in the license application with appropriate references to the detailed analyses in the SAR. Care should be taken to ensure that such references are clear and explicit.

Proposed license conditions should address such subjects as:

1. Administrative and management organization, procedures, controls (including review and approval activities), and auditing and reporting requirements. In particular, the subject of interfaces between the licensee and its contractors should be discussed.

2. Verification of design features that are important to safety. Those quality assurance activities that confirm that design and construction are being carried out in accordance with plans, e.g., inspection hold points, should be discussed. In particular, identify who is responsible for performing this verification.

3. Test procedures. Such subjects as conditions applicable to site evaluation, component testing during design and construction, preoperational testing prior to startup, and conditions applicable to tests that may be desirable after the commencement of operations should be discussed.

4. Functional and operating limits, monitoring instruments and limiting control settings. The operating limits necessary for (a) protecting the integrity of the spent fuel or solidified high-level radioactive waste, (b) protecting employees against radiation exposure, and (c) preventing uncontrolled release of radioactive material should be discussed. Radiation monitoring instruments and their limiting control settings should be described.

5. Limiting conditions of operation. The functional capabilities or performance levels of equipment and systems that are important to safety should be addressed. The subject includes setpoint limits on monitoring instruments and any controls that may need to be imposed on personnel access to any part of the installation.

6. Surveillance requirements. Such items as the periodic inspection of cranes and storage structures and, for water pools, water purity and evidence of corrosion should be covered.

VALUE/IMPACT STATEMENT

A draft value/impact statement was published with the proposed Revision 1 to Regulatory Guide 3.50 (Task CE 402-4) when the draft guide was published for public comment in September 1986. No changes were necessary, so a separate value/impact statement for the final guide has not been prepared. A copy of the draft value/impact statement is available for inspection and copying for a fee at the Commission's Public Document Room at 2120 L Street NW., Washington, DC, under Task CE 402-4.

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