



U.S. NUCLEAR REGULATORY COMMISSION

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# REGULATORY GUIDE

OFFICE OF NUCLEAR REGULATORY RESEARCH

## REGULATORY GUIDE 3.15 (Task CE 219-4)

### STANDARD FORMAT AND CONTENT OF LICENSE APPLICATIONS FOR STORAGE ONLY OF UNIRRADIATED POWER REACTOR FUEL AND ASSOCIATED RADIOACTIVE MATERIAL

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#### USNRC REGULATORY GUIDES

Regulatory Guides are issued to describe and make available to the public methods acceptable to the NRC staff of implementing specific parts of the Commission's regulations, to delineate techniques used by the staff in evaluating specific problems or postulated accidents, or to provide guidance to applicants. Regulatory Guides are not substitutes for regulations, and compliance with them is not required. Methods and solutions different from those set out in the guides will be acceptable if they provide a basis for the findings requisite to the issuance or continuance of a permit or license by the Commission.

This guide was issued after consideration of comments received from the public. Comments and suggestions for improvements in these guides are encouraged at all times, and guides will be revised, as appropriate, to accommodate comments and to reflect new information or experience.

Comments should be sent to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch.

The guides are issued in the following ten broad divisions:

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|-----------------------------------|-----------------------------------|
| 1. Power Reactors                 | 6. Products                       |
| 2. Research and Test Reactors     | 7. Transportation                 |
| 3. Fuels and Materials Facilities | 8. Occupational Health            |
| 4. Environmental and Siting       | 9. Antitrust and Financial Review |
| 5. Materials and Plant Protection | 10. General                       |

Copies of issued guides may be purchased at the current Government Printing Office price. A subscription service for future guides in specific divisions is available through the Government Printing Office. Information on the subscription service and current GPO prices may be obtained by writing the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Publications Sales Manager.

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## INTRODUCTION

Section 70.3, "License Requirements," of 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," states that no person subject to the regulations in Part 70 may receive title to, own, acquire, deliver, receive, possess, use, or transfer special nuclear material, except as authorized in a license issued by the Commission. The required content of an application for such license is described in general terms in § 70.22 of 10 CFR Part 70. This guide describes the detailed information that is needed by the NRC staff in its review of an application for a license to authorize the receipt, possession, and storage of unirradiated fuel assemblies and associated radioactive materials for eventual use in a nuclear power reactor and suggests a format for its presentation.

Any guidance in this document related to information collection activities has been cleared under OMB Clearance No. 3150-0009.

### Purpose and Use

This Standard Format and Content has been prepared to encourage a uniformity in these license applications and to provide detailed guidance on the information that should be provided in the applications. The information provided in the license application must be sufficient to permit a determination to be made of whether the applicant's proposed activities can be conducted without undue risk to the health and safety of the public and the common defense and security. The information identified herein represents the minimum that should be provided. Additional information may be requested if needed for the NRC staff review.

The Standard Format identifies the principal detailed information that the NRC staff needs for its evaluation of the application. In providing the information described in the Standard Format, the applicant should use a narrative form of presentation.

The application must provide the information required by § 70.22 of Part 70. Applicants may request exemption from the requirements of § 70.24\* as provided in paragraph 70.24(d).

### Proprietary Information

Proprietary information should be submitted separately. When submitted, this information should be clearly identified and accompanied by the applicant's detailed reasons and justifications for requesting its being withheld from public disclosure, as specified by § 2.790, "Public Inspections, Exemptions, Requests for Withholding," of 10 CFR Part 2, "Rules of Practice for Domestic Licensing Proceedings."

### Style and Composition

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

\*Applicants for a license for a nuclear power plant are exempt from the requirements of paragraph 70.24(b) in accordance with paragraph 70.24(c).

References, including author, date, and page number, should be cited within the text if this is important to the meaning of the statement. Other references used should appear either as footnotes on the page where referenced or at the end of each chapter.

Where numerical values are stated, the number of significant figures given should reflect the accuracy or precision to which the number is known. Where appropriate, estimated limits of error or uncertainty should be given.

Abbreviations should be consistent throughout the license application and should be consistent with generally accepted usage. Any abbreviations, symbols, or special terms not in general usage or unique to the proposed installation should be defined when they first appear in the license application. NUREG-0544, "A Handbook of Acronyms and Initialisms,"\* may be useful.

Graphic presentations such as drawings, maps, diagrams, sketches, and tables should be employed if the information may be presented more adequately or conveniently by such means. Due concern should be taken to ensure that all information so presented is legible, that symbols are defined, and that drawings are not reduced to the extent that visual aids are necessary to interpret pertinent items of information. These graphic presentations should be located with the section in which they are primarily referenced.

The license application should provide the information needed to satisfy the requirements of the NRC regulations, which are codified in Title 10, Chapter I, of the Code of Federal Regulations. As the sections of the application are developed by the applicant, the applicable regulatory requirements that are being satisfied should be identified. This procedure will contribute to a more timely review of the presented information.

### Physical Specifications

#### 1. Paper Size

Text pages: 8-1/2 x 11 inches.

Drawings and graphics: 8-1/2 x 11 inches preferred; however, a larger size is acceptable provided the finished copy when folded does not exceed 8-1/2 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. Page Margins. A margin of no less than 1 inch should be maintained on the top, bottom, and binding side of all pages submitted.

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\* Copies may be obtained at current prices from the National Technical Information Service, Springfield, Virginia 22161.

#### 4. Printing

**Composition:** text pages should be single spaced.

**Type face and style:** should be suitable for reproduction by microfilming or image-copying equipment.

**Reproduction:** may be mechanically or photographically reproduced. All pages of text should be printed on both sides with image printed head to head.

#### 5. Binding. Pages should be punched for standard 3-hole loose-leaf binders.

#### Procedures for Updating or Revising Pages

Data and text should be updated or revised by replacing pages. "Pen and ink" or "cut and paste" changes should not be used.

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 margin. The line should be of the same length as the portion actually changed.

All pages submitted to update, revise, or add pages to the application should show the date of change and a change or amendment number in the lower righthand corner. A guide page listing the pages to be inserted and the pages to be removed should accompany the revised pages.

#### Material Incorporated by Reference

The application should contain all the information in sufficient detail to permit an independent health and safety evaluation of the proposed activities. Information contained in previous communications filed with the Commission by the applicant or the fuel supplier, including any information submitted in connection with the construction permit or operating license application, may be incorporated into the application by reference (applicable portions of the Final Safety Analysis Report (FSAR) should be attached), provided such references are clear and specific and the applicability of the referenced material is demonstrated. References that are not available in the Public Document Room should be provided with the application. An application that is self-contained with respect to technical data can usually be processed more expeditiously than one requiring many referrals to other documents.

#### Distribution

Eight copies of the application in letter form should be submitted. The application should be signed by a corporate officer but need not be notarized.

Copies should be filed with the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Subsequent correspondence should reference the 10 CFR Part 70 docket number.

#### Fees

There is no license fee for a license issued for storage only of fuel to be used in a reactor for which a construction permit has been issued.

## Chapter 1 GENERAL INFORMATION

### 1.1 Reactor and Fuel

This section should provide information regarding the reactor and the fuel.

1. Identify the reactor, all parties (utilities) to the licensing action, its geographic location, and the docket and construction permit numbers.
2. Describe the fuel assemblies, including materials of construction; number of fuel rods; diameter of fuel pellets; cladding thickness and outside diameter; rod pitch; the number and location of instrument, water, or gas channels in the assemblies; and other appurtenances such as control rod guide tubes, spacer rods, and burnable poisons.
3. State the maximum enrichment (pin values) of uranium; maximum quantities (kg) of U-235, U-233, plutonium, natural uranium, depleted uranium, and thorium per assembly; and the total weight of the assembly.
4. State the total number of fuel assemblies for which a license is requested and the total weight of U-235, U-233, plutonium, natural uranium, depleted uranium, and thorium contained therein.

### 1.2 Storage Conditions

This section should provide information regarding the storage conditions.

1. Provide scale drawings showing the areas where fuel assemblies will be stored and, if appropriate, inspected and channeled.
2. Describe the storage environment.
3. Describe the nature of the activities conducted in all adjacent areas and the potential effects of these activities on the safety of storage.
4. Describe the storage facility structures, components, equipment, and systems (e.g., racks, cranes, inspection stands) and provide the design criteria used to ensure structural integrity.
5. Describe the fire alarm and fire control systems.
6. Describe the controls for preventing unauthorized access to areas where special nuclear material is stored.

### 1.3 Physical Protection

If the quantity of U-235, U-233, or plutonium to be possessed under the license is equal to or greater than the quantity specified in paragraph 73.1(b)

of 10 CFR Part 73, "Physical Protection of Plants and Materials," the licensee must comply with the requirements of that regulation. Specific guidance for applicants regarding physical protection will be provided by the Commission.

#### 1.4 Transfer of Special Nuclear Material

This section should provide the required information regarding the transfer, control, and accounting of special nuclear material.

1. If the fuel fabricator or other organization is responsible for the shipment of fuel to the applicant, identify the responsible shipper.

2. If the applicant is responsible for the packaging of fuel for delivery to a carrier for transport, information concerning the packaging and transfer should be provided in accordance with the provisions of 10 CFR Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions."

3. Describe the special nuclear material control and accounting practices to be implemented to comply with the applicable provisions of 10 CFR Part 70.

#### 1.5 Financial Protection and Indemnity

Requirements for financial protection to be provided by licensees are set forth in 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements." This section should provide the required information regarding financial protection.

1. Persons subject to Subpart B (private organizations) should furnish proof of financial protection (see § 140.15) in the amount required by § 140.13.

2. Persons subject to Subpart C (Federal agencies as defined in paragraph 140.3(c)) are not required to furnish financial protection (see §§ 140.51 and 140.52).

3. Persons subject to Subpart D (nonprofit educational institutions) are not required to furnish financial protection (see §§ 140.71 and 140.72). The applicant should submit a statement certifying that the applicant is a nonprofit educational institution and that the license for which application is made will be used in connection with the conduct of educational activities.

**Note:** With respect to each category of licensee in Section 1.5, the Commission will execute and issue agreements of indemnity pursuant to the regulations in 10 CFR Part 140.

## Chapter 2 HEALTH AND SAFETY

### 2.1 Radiation Control

This section should provide information regarding the radiation control program.

1. State the minimum qualifications for the key positions having radiation safety responsibilities.
2. Describe the responsibilities for the key radiation safety personnel.
3. Indicate the training and experience of the person or persons responsible for radiation safety.
4. Describe the procedures and equipment for checking for contamination and the steps that will be taken if contamination is detected.
5. State the frequency and methods for calibrating and testing radiological protection instruments.
6. Describe the procedures and equipment to be used to meet applicable sections of 10 CFR Part 20, "Standards for Protection Against Radiation."
7. Describe the provisions for disposal of any radioactive wastes that are generated.

### 2.2 Nuclear Criticality Safety

This section should provide the required information regarding nuclear criticality safety.

1. State the minimum qualifications for the key positions having nuclear criticality safety and fuel handling responsibilities.
2. Describe the responsibilities for the key personnel responsible for nuclear criticality safety and fuel handling.
3. If fuel elements will be stored in shipping containers, describe the containers, the storage array, and the basis for nuclear criticality safety of the container storage array.
4. If elements will not be stored in their shipping containers, provide a nuclear safety analysis of the alternative storage, including a description of the physical means for maintaining safe spacing of the elements (e.g., storage racks) and controls to be exercised over placing the elements in the storage location. In situations in which nuclear safety depends on proper spacing, the integrity of storage fixtures should be analyzed from the standpoint of possible failure due to such factors as loading, shock, fire, or corrosion. Provide drawings or sketches of racks and provide the spacing between elements and between elements and floors or walls.

5. If nuclear criticality safety is based on other than the maximum enrichment of the fuel, identify and justify the nominal enrichment used in the safety analysis.

6. If nuclear criticality safety is based on the reactivity effects of neutron absorber materials in the racks, describe the chemical and physical properties of the materials. Drawings or sketches showing the dimensions and locations of the neutron absorber materials should be provided. Describe quality assurance activities to ensure the continued presence and effectiveness of the neutron absorber materials.

7. If nuclear safety is based on moderation control, sources of water that go into dry storage (e.g., sprinkler systems) and the probability of flooding the storage area should be taken into account in the analysis. The nuclear safety analysis should demonstrate that fuel will be stored in such a manner that if the fuel were flooded and then drained, water could not be retained around or within an assembly; however, if water retention is possible, its results should be evaluated. The analysis should also evaluate the effects of low-density moderators (e.g., mist) or show that such densities are not credible.

8. Describe the validation of the calculational method for nuclear criticality safety. For guidance on validation of calculational methods, see Regulatory Guides 3.4, "Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors," and 3.41, "Validation of Calculational Methods for Nuclear Criticality Safety."

9. If elements will be removed from storage (e.g., for inspection purposes), describe in detail the activities to be performed and the controls to be exercised over removing and replacing the elements. The maximum number of fuel assemblies that will be out of approved shipping containers or approved storage racks at any one time should be stated; this number should be justified, preferably on the basis that it is less than the minimum number required to achieve criticality under optimum conditions of spacing, moderation, and reflection. As an alternative, the applicant may justify the safety of a large number of assemblies on the basis of a nuclear safety analysis that includes the considerations in paragraphs 4 and 7 of this section.

10. If an exemption from the requirements of § 70.24 is not requested or has been disapproved, describe the plans for compliance with the requirements of § 70.24,\* including instrumentation, location of detectors, and emergency procedures and drills.

### 2.3 Accident Analysis

This section should identify and evaluate potential accidents that could affect the safety of storage, such as dropping fuel assemblies or other objects over the storage area or dropping fuel assemblies at other places, and the emergency plan of action if such events should occur.

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\* Applicants for a license for a nuclear power plant are exempt from the requirements of paragraph 70.24(b) in accordance with paragraph 70.24(c).

### Chapter 3 OTHER MATERIALS REQUIRING NRC LICENSE

If source or special nuclear materials other than those contained in fuel assemblies or if byproduct materials are to be possessed at the storage site (e.g., fission chambers, calibration sources, or startup sources), the following information should be provided:

1. Identify the type and amount of material and conditions of storage.
2. Describe the use if other than storage.
3. Describe radiation protection provisions.
4. Describe the control and accounting procedures for other special nuclear material.

### VALUE/IMPACT STATEMENT

The original version of Regulatory Guide 3.15 was issued in October 1973. Many of the applications by utilities for "Storage Only" licenses are incomplete, particularly regarding the information required to perform an independent nuclear criticality safety analysis of the fuel storage arrangements. The revised guide should assist the applicant in preparing a more complete application and reduce the amount of additional information the NRC must request of the applicant. The revised guide also updates the physical protection requirements.

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NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555**

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