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OFFICE OF NUCLEAR REGULATORY RESEARCH

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STANDARD FORMAT AND CONTENT FOR THE HEALTH AND SAFETY SECTIONS OF LICENSE RENEWAL APPLICATIONS FOR URANIUM HEXAFLUORIDE PRODUCTION

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INTRODUCTION

Section 40.43, "Renewal of Licenses," of 10 CFR Part 40, "Domestic Licensing of Source Material," specifies that applications for renewal of specific licenses, including those for production of uranium hexafluoride, should be filed in accordance with § 40.31, "Applications for Specific Licenses." Section 40.31 identifies the general information required. This "Standard Format and Content for the Health and Safety Sections of License Renewal Applications for Uranium Hexafluoride Production" (hereinafter referred to as Standard Format) was prepared to provide more specific guidance for the preparation of the health and safety sections of renewal applications. The Environmental Report is submitted separately.

The NRC staff suggests the use of this Standard Format for renewal applications to facilitate their preparation by licensees and their timely and uniform review by the NRC staff. Information contained in previous submittals, statements, or reports filed with the NRC under the license may be incorporated by reference provided such references are clear and specific. The information called for in this regulatory guide that is incorporated by reference to a previous application should be summarized. In Part I, the licensee should reference appropriate sections of Part II to avoid duplication of information and to avoid lengthy descriptions.

A renewal application should be filed in proper form not less than 30 days prior to expiration of the existing license (see paragraph 40.43(b) of 10 CFR Part 40). However, the NRC suggests that earlier filing is preferable.

The renewal application for the health and safety section of the license consists of two major parts. The first part contains the proposed license conditions stating the performance requirements to which the applicant proposes to commit. The second part contains detailed safety information and descriptive information demonstrating the applicant's adherence to the conditions of the first part. The Standard Format is designed to separate the requirements in Part I (license conditions) from the descriptive information in Part II (demonstration and performance record). The information in Part I is of major importance to the NRC inspection and enforcement staff and should be written so as to be inspectable and verifiable. The information in Part II, on the other hand, is of major importance to the NRC licensing staff during the review of the license renewal application and should be written to provide the basis for licensing decisions. The Standard Format is acceptable to the NRC staff, but conformance is not required. Renewal applications with different formats will be acceptable to the staff if they provide an adequate basis for the findings required for the issuance of a license.

The NRC's requirements for information needed in its review of applications for licenses to possess and use source material for uranium hexafluoride production may change. The contents of this Standard Format will be revised to reflect rule changes. Revisions of the NRC's needs for information in connection with licensing will be conveyed to the industry and the public in the following principal ways: (1) by revisions to this Standard Format, (2) by the issuance of new or revised regulatory guides, (3) by public announcements, and (4) by direct communications to the applicant from the NRC staff as needed.

The information collection activities mentioned in this regulatory guide are contained as requirements in 10 CFR Part 40, which provides the regulatory basis for this guide. The information collection requirements in 10 CFR Part 40 have been cleared under OMB Clearance No. 3150-0020.

Purpose and Applicability

This Standard Format has been prepared to identify the type and quality of information needed in an application for license renewal. It is recognized that the physical size, process scope (chemical or mechanical), and plant capacity all have a bearing on the complexity and level of license application detail. If additional guidance is required, the applicant is invited to confer with the NRC staff prior to or during the preparation of the application.

In the renewal application, the applicant should analyze the plant in terms of potential hazards and the means, including appropriate margins of safety, employed to protect against these hazards. Sufficient information should be included in Part II to allow the NRC licensing staff to perform independent analyses to confirm conclusions reached by the applicant. These analyses should include but are not limited to (1) the site and its relationship to accidents from natural phenomena, (2) operations involving radiation exposures, releases to the environment, and the application of the principle of as low as is reasonably achievable (ALARA), (3) operations involving hazardous chemicals, (4) confinement and control of radioactive materials, (5) projected effluent quantities and concentrations and effluent treatment, (6) reliability of the systems essential to safety, (7) prevention and control of fire and explosion, (8) radiological contingency planning, and (9) environmental impact associated with normal operations, abnormal conditions, and accidents.

The renewal application should demonstrate the degree of skill, care, and effort used by the applicant in the uranium hexafluoride production activities. To this end, the applicant may provide in-depth analyses as supplemental reports incorporated in the application by clear and specific references. Common literature or references that are readily available need not be supplied with the application.

Proprietary Information

Proprietary information must be submitted separately. When submitted, it should be clearly identified and accompanied with the applicant's 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." The NRC staff's review of the safety analysis should depend as much as possible on nonproprietary information.

Style and Composition

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

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 errors or uncertainty should be given.

Abbreviations should be consistent throughout the application and should be consistent with generally accepted usage. Any abbreviations, symbols, or special terms not in general usage or unique to the plant should be defined when they first appear in the application or should be presented in a separate "Glossary" of terms and definitions.

References used should appear either as footnotes to the page where referenced or at the end of each chapter.

Graphical Presentations

Graphical presentations such as drawings, maps, diagrams, sketches, and tables should be employed where 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 scales are not reduced to the extent that visual aids are necessary to interpret pertinent items of information. These graphical presentations should be located in the section where they are primarily referenced.

Physical Specifications

Paper size

Text pages: 8-1/2 x 11 inches

Drawings and graphics: 8-1/2 x 11 inches; however, a larger size is acceptable provided the finished copy when folded does not exceed 8-1/2 x 11 inches.

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

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

Printing

Composition: text pages should be single spaced.

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

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

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

Page numbering. Pages should be numbered with the digits corresponding to the chapter followed by a hyphen and a sequential number, e.g., the third page of Chapter 4 should be numbered 4-3. Do not number the entire report sequentially.

Table of Contents. A table of contents and an index of key items should be included in each volume of the renewal application.

Procedures for Updating or Revising Pages

Data and text should be updated or revised by replacing pages. The changed or revised portion on 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 report should show the date of change and a revision or amendment number. A guide page listing the pages to be inserted and the pages to be removed should accompany the revised pages. Where major changes or additions are made, a revised Table of Contents should be provided.

PART I
LICENSE CONDITIONS

Part I of the application contains the proposed license conditions stating performance requirements to which the licensee proposes to commit. This Part I should not contain the detailed descriptive material that is more appropriate in Part II. This part should be written to permit inspection and verification of the stated performance requirements.

If requested information is contained in previous submittals, clear and specific reference to these submittals is acceptable.

Chapter 1 STANDARD CONDITIONS AND SPECIAL AUTHORIZATIONS

1.1 Name, Address, and Corporate Information

The licensee should furnish its full name and address. If the address of the uranium hexafluoride plant is different from that of the licensee, it should be given also. The State where the licensee is incorporated or organized and the location of the principal office should be indicated.

1.2 Site Location

The location of the plant site, i.e., State, county, and municipality, should be given. Also describe the site, plant boundaries, buildings, and other areas and facilities where licensed activities will be conducted. The location of the nearest residence, school, and population center should be identified.

1.3 License Number and Period of License

The licensee should state its license number and the period of time for which license renewal is requested.

1.4 Possession Limits

The maximum quantity of source material to be possessed and used under the license should be identified by mass (kilograms). The chemical and physical forms should also be provided. Similar information (i.e., material identification, physical form, maximum curie content) for other radioactive materials subject to this license should also be identified.

1.5 Authorized Activities

A summary of all activities, locations, and types of processes in which source material and other radioactive materials subject to this license are to be used should be provided.

1.6 Exemptions and Special Authorizations

Any specific exemptions and special authorizations should be listed in this section and justified in the appropriate section in Part II (e.g., monitor alarms, release limits).

Chapter 2 GENERAL ORGANIZATIONAL AND ADMINISTRATIVE REQUIREMENTS

2.1 Organizational Responsibilities and Authority

Key positions with safety-related responsibilities should be identified and their functions described. The licensee should provide separate lines of authority for production and safety functions. The lines of responsibility leading to top management should be indicated.

2.2 Personnel Education and Experience Requirements

The application should contain a description of the minimum qualifications and requirements (i.e., education, training, and experience) for all safety-related positions and for safety committee members.

2.3 Safety Review Committees

The application should contain a list of all safety committees (e.g., ALARA, fire). The function and responsibility of each should be described. The description should include the purpose, charter of responsibilities, frequency of meeting audit and inspection responsibilities, frequency of audits, membership, and reporting and recordkeeping requirements.

2.4 Approval Authority for Personnel Selection

The licensee should state the management level responsible for personnel selection for safety-related staff positions and safety committees.

2.5 Training

The application should contain a description of the program (e.g., plan, content) for training operators and other personnel in safety. Also, describe the system for maintaining records on training of new employees and refresher or upgrading training of personnel.

2.6 Operating Procedures

The licensee should state a commitment to conduct activities involving licensed materials in accordance with approved written procedures. The control system that ensures that written procedures are prepared, reviewed, revised, approved, and implemented should be described.

2.7 Internal Audits and Inspections

The licensee should state its requirements for internal audits and inspections.* Audits and inspections should be conducted to determine that plant operations are conducted in compliance with regulatory requirements, license

*Audits are formal examinations made to verify that operations are being conducted according to established criteria. Inspections are routine reviews to check that operations are being conducted according to approved procedures. Audits are more formal and less frequent than inspections.

conditions, and written procedures. Audits and inspections should apply to radiation protection, hazardous chemical safety, fire protection, and environmental protection and should be performed according to a written plan. Qualified personnel without direct responsibility for the function and area being audited should be used for audits. Inspections should be performed routinely by qualified staff personnel that are not responsible for production activities. The staff positions responsible for audits and inspections should be specified. The level of management to which results are reported and the system to ensure corrective action is taken should also be described.

2.8 Investigations and Reporting

The application should contain a description of procedures for complying with the requirements for reportable incidents. The description should identify the management positions responsible for investigating, recording, reporting, and following up on actions of reportable incidents. Regulatory Guide 10.1, "Compilation of Reporting Requirements for Persons Subject to NRC Regulations," provides a listing of NRC reporting requirements.

2.9 Records

The application should include a description of the system for maintaining records relating to health and safety. Retention time for these records should be specified. Such records should include changes related to safety made under internal review and approval, unusual operational incidents and events associated with radioactivity releases, audits and inspections, instrument calibration, ALARA findings, employee training and retraining, personnel exposures, routine radiation surveys, and environmental surveys.

Chapter 3 RADIATION PROTECTION

3.1 Special Administrative Requirements

3.1.1 ALARA Policy

The licensee should state its policy for keeping occupational radiation exposures and radioactive contamination in effluents as low as is reasonably achievable (ALARA) and also describe how this policy will be implemented.

3.1.2 Radiation Work Permit Procedures

Radiation work permits (RWPs) should be issued whenever an activity involving licensed materials is not covered by a written operating procedure and the radioactivity levels are likely to exceed the limits specified in 10 CFR Part 20. The criteria for issuing and the procedures for issuing and terminating RWPs should be described.

3.2 Technical Requirements

3.2.1 Restricted Areas--Access Control

The application should contain a description of the restricted areas and the means used to control entry and exit. The description should include:

1. Change rooms. Identify physical limits (e.g., step-off pads) and means of access control.

2. Protective clothing. Describe the policy on the use of protective clothing and change facilities.

3. Personnel monitoring systems.

4. Personnel decontamination policy. Describe cleanup facilities and provisions for special personnel decontamination.

3.2.2 Ventilation

The application should contain a description of ventilation systems. The description should include:

1. Minimum flow velocity, maximum differential pressure measurement across filters, and frequency of system checks.

2. Criteria for filter replacement.

3.2.3 Work-Area Air Sampling

The application should contain a commitment to conduct programs for determining airborne radioactivity in work areas. Specify the radioactivity level at which action will be taken and describe the actions to be taken.

3.2.4 Radioactivity Measurement Instrumentation

The application should identify the types of instrumentation used for measuring radioactivity. The purpose (e.g., radiation surveys, personnel monitoring), range, sensitivity, alarm setpoints, calibration method and frequency, and testing should be described.

3.2.5 Radiation Exposures

The application should contain a commitment to conduct programs for determining, validating, and controlling occupational exposures. Specify the dose level at which action will be taken and describe the actions to be taken if these levels are exceeded.

3.2.6 Surface Contamination

Allowable limits on surface contamination (fixed and removable) should be specified for clean (uncontrolled), intermediate (e.g., change rooms), and controlled areas. Action levels for immediate and delayed cleanup should be specified for each type of area. Actions to be taken if action levels are exceeded should be described. The frequency and method of surface contamination surveys in each type of area should be specified.

Chapter 4 ENVIRONMENTAL PROTECTION

4.1 Effluent Control Systems

Radioactivity levels in gaseous and liquid effluents that require a commitment to action should be specified. The action levels should be selected to meet regulatory limits, including ALARA commitments. These limits must ensure compliance with the Environmental Protection Agency's regulations in 40 CFR Part 190, as required by paragraph 20.105(c) of 10 CFR Part 20. The application should contain a description of anticipated corrective actions to be taken if these limits are exceeded. Limits at which an operation will be shut down should be specified.

4.2 Environmental Monitoring

The radiological environmental monitoring program should be described. The description should explain methods of sampling and analyses of air, soil, vegetation, surface water, and ground water to be used for evaluating radioactivity released from the plant. For instance, the application should show the location of the sampling stations, including any background stations, and the procedures for evaluating and reporting the results of this monitoring program.

The application should also contain a description of the nonradiological monitoring program used to meet State and Federal requirements, including sampling of stack gases, soil, vegetation, surface water, and ground water for chemical pollutants. List and give the status of all licenses, permits, and other approvals of plant operations required by Federal, State, local, or regional authorities.

Chapter 5 SPECIAL PROCESSES

5.1 Proprietary Information

The application should contain descriptions of special procedures or actions required for unique processes or operations. Descriptions of special processes may contain proprietary information, which should be submitted separately in accordance with § 2.790 of 10 CFR Part 2.

5.2 Process Vents - Radioactive and Hazardous Chemical Controls

Equipment and process parameters selected to contain, remove, and control gases and fumes containing radioactive and hazardous chemicals should be described. Chemical and mechanical interactions of gases with removal components and the performance of control devices should be explained. Release limits, alarm setpoints, and instrumentation calibration and testing should be stated in terms that can be inspected and verified. The licensee should specify performance requirements, such as action levels and corrective actions to be taken.

5.3 Occupational Safety

Action levels and corrective actions should be identified for events involving radioactive and hazardous chemicals that could significantly affect safety. The licensee should specify maximum permissible concentrations, threshold value limits, and permissible exposure limits for fluorides and other hazardous chemicals.

5.4 Emergency Utilities

The application should contain a description of systems and equipment that provide auxiliary utility services that are important to safety. For instance, an emergency electric power supply should be available to provide light for emergency exit and to maintain operability of radiation detection instrumentation.

5.5 Radioactive Waste Management

The application should contain a description of processes and systems used for handling, storing, and disposing of radioactive wastes. If radioactive wastes are stored on the site, methods for containment and monitoring of containment should be explained.

Chapter 6 DECOMMISSIONING PLAN

The licensee should reaffirm the commitment to decommission the facility and the site at the end of its operation in a manner that will protect the health and safety of the public. Plans for decontaminating the facility and site so the facility and grounds can be released for unrestricted use should be provided. The application should include an updated estimate of the costs involved and a description of the financial arrangements made to ensure that adequate funds will be available to cover these costs at the time of decommissioning.

Chapter 7 RADIOLOGICAL CONTINGENCY PLAN

The Radiological Contingency Plan that was submitted in accordance with NUREG-0762* should be incorporated by reference.

*NUREG-0762, "Standard Format and Content for Radiological Contingency Plan for Fuel Cycle and Materials Facilities," July 1981, is available from the NRC/GPO Sales Program, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

PART II

SAFETY DEMONSTRATION

Part II of the application contains detailed information demonstrating the applicant's adherence to the license conditions. The information submitted in this part should be written to provide a basis for licensing decisions.

If requested information is contained in previous submittals, clear and specific reference to these submittals is acceptable.

Chapter 8 OVERVIEW OF OPERATION

8.1 Corporate Information

The application should contain a description of the corporate arrangement of the uranium hexafluoride production organization. If the corporation is made up of two or more persons, the relationship and responsibilities of each should be explained.

8.2 Financial Qualification

The licensee should provide sufficient information to demonstrate financial capability for operating and decommissioning the plant. A copy of the latest corporate annual report may satisfy this requirement.

8.3 Summary of Operating Objective and Process

The application should contain a summary description of the uranium hexafluoride production activities, such as the function and operation, process capacity, feed and products, and processes used. In particular, identify any processing changes or additions made since the last license renewal.

8.4 Site Description

The application should contain information on the location of the plant and a description of the geographical, demographical, meteorological, hydrological, seismological, and geological characteristics of the site and surrounding area. The objective is to indicate what, if any, site characteristics influenced plant design and mode of operation.

8.5 Location of Buildings On Site

The application should contain descriptive information on the buildings and other installed features of the plant and their location on the site. In particular, identify any changes or additions made since the last license renewal.

8.6 Maps and Plot Plans

A map of the site should be included in the application and should be of suitable scale to clearly define the boundary of the site and the distance from significant facility features to the site boundary. The area to be considered as the exclusion area should be clearly delineated if its boundaries are not the same as the boundaries of the plant site. A general location map encompassing at least an 80-km (50-mi) radius should also be provided. The application should show any unusual hazard such as a dam upriver from the plant, failure of which could cause flooding at the plant site. Additional maps and site plots should be provided to present details near the plant and to establish orientation of buildings, streams, ponds, and neighboring structures. The location of the site relative to prominent natural and man-made features and the distance and direction to the nearest population centers should be stated.

8.7 License History

The license number, original license issue date, and subsequent renewal dates should be given.

8.8 Changes in Procedures, Facilities, and Equipment

The licensee should describe the administrative procedure and controls that will ensure that an independent safety review of any proposed activity is performed and documented prior to the start of a new activity or change in an existing activity involving licensed material. The administrative procedure should include the following:

1. Assurance of Safety Review. Any proposed change in product design, manufacturing procedures, or processing equipment should be reviewed to ensure that applicable license requirements and safety considerations have been evaluated.

2. Responsibility for Requesting Safety Analysis. Indicate responsibility for selecting the proper administrative procedure to make changes in process, equipment, or operating procedures, e.g., (a) prepare a revised or new radiation safety plan or safety analysis, (b) submit changes to a safety review committee, or (c) apply for an NRC license amendment.

3. Analysis. The evaluation of the proposed change, including the analysis of potential accidents that may affect radiation safety, should be documented.

4. Review. The management positions responsible for review and approval prior to effecting a change should be identified.

5. Approval. Implementation of the proposed change should take place only after final approval in writing by the designated management personnel.

6. Verification. An audit should be made when approved changes are implemented. Periodic inspections of operations should be made to ensure compliance. The positions responsible for the inspection should be indicated.

7. Records. Sufficiently detailed records to permit independent review of the analyses and approval should be maintained.

Chapter 9 FACILITY DESCRIPTION

9.1 Plant Layout

Through the use of drawings and flowsheets, the layout and functional features of the licensed activities should be described. The application should contain plans and elevations in sufficient detail to identify all features to be discussed in this chapter. Spatial and equipment identification data should be included on the layouts or designated in tabular listings. In particular, changes made since the last submittal should be identified.

9.2 Utilities and Support Systems

9.2.1 Electric Power

The source and characteristics of the primary electrical system providing normal power to the plant should be described. The application should also contain a list of systems and equipment that are provided with emergency electric power. The design and operation of the emergency power source or sources should be described.

9.2.2 Compressed Air

The design basis for supplying the compressed air needs of the plant, including air for instrumentation, protective masks, and protective clothing, should be presented. The air system components, location, distribution, and operating characteristics should be described.

9.2.3 Water

The primary source of the water supply, alternative sources, storage facilities, and plant supply loops should be discussed. The quantities of water used under normal and abnormal conditions by service (i.e., potable, process, and fire control) should be itemized. The effects of loss of water supply source, failure of main supply pumps or supply loops, and power failure should be discussed.

9.2.4 Steam

The application should present the design for supplying steam to processing systems, including a discussion of the source, distribution, and reliability of supply. Also, discuss features of the steam supply system in relation to continuity of operations.

9.2.5 Refrigeration

The application should present the design for process refrigeration, including the capacity of each system. Corrective actions that will be taken if uranium or fluoride concentrations in vent gases exceed established limits should be discussed. Corrective actions should be related to written procedures for detecting and correcting excessive contamination in vent gases.

9.3 Ventilation Systems

The ventilation systems and other confinement features should be described. Emphasis should be placed on provisions for coping with releases and the accumulation of licensed materials.

9.4 Radioactive Waste Handling

9.4.1 Liquid Wastes

Sources of contaminated liquid wastes and the liquid waste treatment systems used to process these wastes should be described. Items such as process and maintenance wastes, laboratory wastes, liquid spills, and cleanup and decontamination solutions should be included. The discussion should relate process and equipment to radioactivity and hazardous chemical concentrations, volumes, and quantities. Provisions for storage and identification of those streams that are processed to achieve volume reduction or solidification should be described. The description should be accompanied by appropriate engineering drawings to show locations of equipment and flow paths. Special systems and handling techniques included in the systems to ensure the safety of the operation should be described.

9.4.2 Solid Wastes

Solid wastes that are produced as a result of plant operation should be identified and the systems used to treat and contain these solid wastes should be described. These descriptions should include the following information:

1. The methods and equipment selected for minimizing the generation of solid wastes and for the safe management of the solid waste that is generated.

2. The equipment and associated features that are used for volume reduction, containment or packaging, storage, and disposal.

3. The physical, chemical, and thermal characteristics of the solid wastes, including an estimate of concentrations and volumes generated.

For solid wastes that are to be retained on the site, the containment and storage methods should be described. Corrosion aspects and monitoring of the containment should be discussed. Describe how these wastes will be disposed of at the time the plant is decommissioned.

9.5 Shipping and Receiving

The application should contain a description of methods for contamination control associated with receipt, storage, handling, and shipping of containers of source and other nuclear materials. The following regulatory guides may be used for guidance:

- 7.3 - Procedures for Picking Up and Receiving Packages of Radioactive Material
- 7.4 - Leakage Tests on Packages for Shipment of Radioactive Materials
- 8.24 - Health Physics Surveys During Enriched Uranium-235 Processing and Fuel Fabrication

9.6 Chemical Systems

The major components and operating characteristics of facilities used for nonradioactive chemical supply, storage, and distribution should be described. If hazardous chemicals or materials are involved, provisions that mitigate or prevent accidents should be described. Itemize the chemicals and materials that are used, list their quantities, and identify where they are used.

9.7 Fire Protection

The codes and standards considered and used for the design of the buildings and the fire protection systems, including published standards of the National Fire Protection Association, should be listed. Provide evidence of the adequacy of the fire protection program for the facility through nuclear liability and property insurance coverage and inspection reports.*

The qualifications of the fire protection engineer (or consultant) who was responsible for the design of the fire protection system should be stated. Describe also the design and selection of equipment, inspection and testing of the physical aspects of the system, development of the fire protection program, and firefighting training for the operating plant. State, by position, the personnel responsible for inspecting and maintaining the fire protection equipment. Procedures for storage of combustibles and combustible contaminated waste should be described.

*It is recommended that the latest edition of "International Guidelines for Fire Protection at Nuclear Installations," prepared by an international working party representing over 20 nuclear risk insurance pools and associations worldwide, be used. This document is available from the British Insurance Committee (Atomic Energy), Aldermary House, Queen Street, London, EC4N 1TH.

Chapter 10 ORGANIZATION AND PERSONNEL

The organization for operation of the facility should be described. Sufficient detail should be provided to indicate how the applicant intends to ensure that a technically competent staff will be maintained to provide continued implementation of administrative and operating procedures and programs that relate to health and safety.

10.1 Organizational Responsibilities

The managerial responsibilities relative to the health and safety aspects of the facility should be described.

10.2 Organization Charts

The application should contain a description of the organizational arrangement showing the title of each safety-related position, the qualifications of the employee occupying each of these positions, and the flow of responsibility as depicted by an organization chart (including Safety Review Committees).

10.3 Operating Procedures

The methods and organizational positions involved in the preparation, review, and approval of written procedures for plant operation should be described.

10.4 Functions of Key Personnel

The functions, responsibilities, and authorities of key personnel positions should be described. A discussion of specific succession to responsibility for operation of the plant in the event of absences, incapacitation, or other emergencies should be included.

10.5 Education and Experience of Key Personnel

The résumés of personnel assigned to safety-related positions should be presented. Identify individuals by position and title and, as a minimum, describe their formal education, training, and experience.

10.6 Training

The application should contain a description of the training program for new and old employees and for reinstruction when changes are made to processes involving nuclear materials, radiation protection procedures, fire protection, or emergency procedures. Specialized training should be commensurate with the extent of the employee's contact with hazardous materials.

The training program should include ALARA practices, instrumentation and control, methods of dealing with process malfunctions, control of hazardous chemicals, fire protection, control of contamination, decontamination procedures, and emergency procedures. General subjects such as the nature and source of radiation, interactions of radiation and matter, biological effects of radiation, and use of radiation monitoring equipment should also be included.

Chapter 11 RADIATION PROTECTION

11.1 Program

The program for conducting radiation surveys and the plans that have been developed for ensuring that occupational radiation exposure will be ALARA should be described. Also describe the methods for monitoring personnel exposures and the contamination of equipment and surfaces and the actions taken to control them. The guidance in the following regulatory guides may be useful in developing this program:

8.4 Direct-Reading and Indirect-Reading Pocket Dosimeters
8.7 Occupational Radiation Exposure Records Systems
8.9 Acceptable Concepts, Models, Equations, and Assumptions for a Bioassay Program
8.10 Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable
8.24 Health Physics Surveys During Enriched Uranium-235 Processing and Fuel Fabrication

11.2 Posting and Labeling

The posting and labeling program used to comply with § 20.203 of 10 CFR Part 20 should be described.

11.3 External Radiation - Personnel Monitoring

The personnel monitoring program for external radiation should be described. Indicate what types of personnel monitoring equipment are used to provide data for evaluation of doses to individuals and for the assignment of those doses to specific operations. The type, range, sensitivity, and accuracy of the personnel dosimeters should be provided. Also describe how dosimeter readers are tested for accuracy if the personnel dosimeters are read by the licensee. Specify the frequency of reading personnel dosimeters and recording the radiation dose. Also describe how dosimetry results will be used as a guide to operational planning.

11.4 Radiation Surveys

The application should contain descriptions of the routine radiation survey program and special surveys for planning and preparing maintenance operations to ensure that occupational exposures are ALARA. Describe the bases for these activities, for example, using surveys to obtain information on radiation, contamination, and airborne radioactive material, and the mechanical difficulties that might be encountered while performing the surveys.

11.5 Reports and Records

Reports should conform to reporting commitments of Section 2.9 in Part I. Records that will be maintained and their required retention times should be described. The records should include principal maintenance, alterations or

additions made, unusual operational incidents, events associated with radioactivity releases, audits and inspections, instrument calibration, ALARA findings, employee training and retraining, personnel exposure, routine and special radiation surveys, and environmental surveys.

11.6 Instruments

The application should provide the criteria for selecting radiation measurement instruments for:

1. Performing radiation and contamination surveys,
2. Sampling airborne radioactivity,
3. Monitoring area radiation,
4. Monitoring personnel, and
5. Monitoring radioactivity in effluents and in the immediate environment of the plant.

Instrumentation and related equipment and the quantities of such equipment provided for plant operations should be described. Also describe the instrument storage, calibration, and maintenance facilities; the health physics facilities; and the laboratory facilities for radioactivity analyses.

11.7 Protective Clothing

The application should contain a description of the protective clothing available for operating personnel for normal, maintenance, and accident conditions.*

11.8 Administrative Control Levels, Including Effluent Control

The application should contain a description of action levels, alarm setpoints, frequency of measurements, and action to be taken for the following radiation protection monitoring programs:

1. Occupational exposure (internal and external),
2. Airborne activity (area and stack or vent monitors),
3. Liquid activity (effluent monitors),
4. Surface contamination (work areas, release of equipment or packages, skin contamination).

The application should also contain a description of the sampling method, sampling frequency, analyses, lower limits of detection, instrumentation calibration and testing, method of reporting, and responsibility (by position) for all effluents at their point of discharge. The location of liquid effluent discharge points should be shown and labeled on appropriate plot plans (see Section 8.6). Limits selected for a commitment of action and actions to be taken should be described. The application should contain a description of methods for demonstrating compliance with the Environmental Protection Agency's regulations in 40 CFR Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations" (see paragraph 20.105(c) of 10 CFR Part 20).

*Refer to "Certified Personnel Protective Equipment List" of the National Institute of Occupational Safety and Health (NIOSH). This list is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

11.9 Respiratory Protection

Respiratory protective equipment may be needed to limit the inhalation of airborne radioactive materials and hazardous chemicals. The respiratory protection program for protection against radioactive materials should be described.* Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection," is used by the staff when evaluating programs for protection against airborne radioactive materials.

11.10 Occupational Exposure Analysis

As an appendix or addendum to the application, provide an analysis of occupational exposures (external and internal) covering at least the past two years of plant operation for each plant area and type of operation performed. The analysis should identify the sources of major exposures and the locations where they occurred in relation to job categories and work activities. Any trends in exposures that can be identified should be discussed. Unusual operational incidents should be reviewed and categorized by such aspects as frequency, operations being performed, and the magnitude of the resulting exposure. The analysis of internal exposures should consider air sampling data as well as bioassay data (including in vivo counting). The analysis should conclude with a description of any steps or measures taken to reduce employee exposure, the effectiveness of these measures, and any additional actions planned.

11.11 Measures Taken To Implement ALARA

The ALARA program pertaining to radiation workers and ALARA committee activities should be described. The committee's membership, frequency of meetings, and scope should be stated. The procedures for performing the required audits and inspections of operations and for review of all new activities or changes in existing activities should also be described. Regulatory Guide 8.10, "Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable," may be useful in developing an ALARA program. A periodic report summarizing employee exposures and effluent release data should be made to senior management.

As part of the ALARA program, the licensee should investigate and report to NRC incidents and situations that significantly reduce the effectiveness of health and safety programs. For example, the licensee should analyze data from surveillance and monitoring programs for trends that may indicate an increasing trend in radiation exposures. Appendix A provides a listing of some events that should be considered for analysis.

11.12 Bioassay Program

The bioassay program to detect and monitor any significant deposition of radioactive material in the body should be described. The description should include the frequency of data collection and an evaluation of the urine bioassay

*Information on generally applicable respiratory protection is contained in the regulations of the Department of Labor, Occupational Safety and Health Administration, in § 1910.134, "Respiratory Protection," of 29 CFR Part 1910.

sampling program (routine and special). Regulatory Guides 8.9, "Acceptable Concepts, Models, Equations, and Assumptions for a Bioassay Program," and 8.11, "Applications of Bioassay for Uranium," may be used as guidance on such topics as (1) the necessity for bioassay procedures, (2) the bioassay techniques to use and their frequency, (3) selecting participants, (4) actions to be taken based on bioassay results, (5) the particular results that should initiate such action, and (6) diagnostic evaluation.

11.13 Air Sampling and Internal Exposure Program

The application should contain a description of the air sampling and analysis program used for monitoring the concentrations of radioactivity in working areas and detecting the presence of unsafe concentrations. The description should include the location of samplers, types of equipment (for routine or special use), calibration, frequency of sampling, analytical methods, and program quality controls. Action levels and actions to be taken if these levels are exceeded should be specified, including any action level at which an operation will be shut down. Methods used to correlate work-area radioactivity concentrations in air samples with personal dose exposure calculations, including averaging techniques, should be explained. Methods used to corroborate personal dose evaluations, e.g., urine bioassay sampling and in vivo body counting, should be described. Supply a list of types and numbers of instruments used for measuring radioactivity in air. Describe conditions under which air sampling instruments (e.g., work-area samplers, continuous air monitors, lapel air samplers) will be used.

11.14 Surface Contamination

Controlled areas established to prevent the spread of contamination should be identified. Include locations of step-off pads, change facilities, protective clothing facilities, and personnel monitoring instruments. The policy on the use of protective clothing should be stated. Surface contamination surveys, allowable limits (fixed and removable), and action levels for immediate cleanup or delayed cleanup should be specified for clean (uncontrolled) areas, intermediate areas (e.g., change rooms), and controlled areas.

The frequency of surface contamination surveys in each area should be stated. A list of types and numbers of instruments used for determining radiation should be supplied. The personnel contamination control and radiation level survey programs, including survey frequency, instruments used (type, range, sensitivity, and accuracy), action levels, and actions to be taken, should be described.

Guidance on the release of equipment and packages from the plant site is given in "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," dated July 1982.*

*Available from the U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, Division of Fuel Cycle and Material Safety, Uranium Fuel Licensing Branch, Washington, D.C. 20555.

Chapter 12 ENVIRONMENTAL SAFETY--RADIOLOGICAL AND NONRADIOLOGICAL

Using radiation measurements obtained from the environmental monitoring program (including sampling and analysis of surface water, ground water, air, soil, and vegetation and the determination of gamma dose levels at points around the plant) during at least the past two years, the maximum annual dose equivalent to the whole body and to any other organ of any member of the public should be determined. The nonradiological environmental impacts of gaseous and liquid effluents from the plant during the past two years of normal operation should be summarized. The nonradiological gaseous and liquid concentration and release rates at the plant site boundary for the past two years should also be reported.

Chapter 13 PROCESS DESCRIPTION AND SAFETY ANALYSES

13.1 Process Steps and Flowsheets

The equipment and process controls for each system, including ancillary systems if pertinent to the main process (e.g., hydrogen fluoride supply and distribution systems, decontamination systems, scrap recycle systems, vacuum cleanup systems), should be described. Process, instrumentation, and electrical flowsheets and mass-balance data should be provided where pertinent to facilitate the description.

13.2 Safety Analysis of Each Step

The application should contain a safety analysis for each step of the process. The analyses should show how the commitments specified in Part I will be met.

13.3 Safety Features of Each Step

Safety-related features, systems, or special handling techniques included in systems for the safety of the operation under both normal and abnormal conditions should be described. Limits selected for a commitment of action and the actions to be taken if these limits are exceeded should be specified. A summary description of the principal hazards and the approaches used to preclude or mitigate accidents should be provided.

Chapter 14 ACCIDENT ANALYSES

The types of accidents considered and their potential impact on occupational safety and the environment should be summarized. Appropriate reference to the Environmental Report and Radiological Contingency Plan should be made.

APPENDIX A

POTENTIAL TOPICS FOR TREND ANALYSIS

1. Personnel exposures.
2. Concentrations of airborne radioactive and hazardous chemical contamination in plant areas and effluents.
3. Radioactive contamination in areas and on equipment not normally contaminated.
4. Failure of required radiation measurement instrumentation to operate properly.
5. Failure of respiratory protective equipment to work properly.
6. Failure of effluent filters to meet specifications.
7. Calculated or measured offsite exposure to any member of the public.

VALUE/IMPACT STATEMENT

1. PROPOSED ACTION

1.1 Description

The Commission's regulations in 10 CFR Part 40, "Domestic Licensing of Source Material," identify the general information to be supplied in applications for licenses to possess and use source material in uranium hexafluoride production plants. However, Part 40 does not specify the detail of the information needed by the staff in its review of an application for license renewal or a format for its presentation. The proposed action is to provide guidance on format and content for the preparation of applications for the renewal of licenses for uranium hexafluoride production.

1.2 Need for Action

The NRC Office of Inspector and Auditor reviewed the license renewal process in a January 1978 report to the Commissioners. It concluded that the staff should pursue the development of applicable guides, one of which is this standard format and content guide. The proposed action is issuance of effective guidance for preparing an application for the renewal of a license for uranium hexafluoride production.

1.3 Value/Impact of Proposed Action

1.3.1 NRC Operation

The proposed action identifies the type of information needed and the desired format for its presentation to facilitate orderly NRC staff review of license renewal applications for uranium hexafluoride production. The staff review effort should be reduced because license renewal applications will be complete at the time of submittal. Considerable time on the part of the Office of Inspection and Enforcement would be saved because license conditions should be more complete and inspectable and would provide a firm basis for the resolution of findings.

1.3.2 Other Government Agencies

Other Government agencies are not involved in this proposed action; therefore there is no impact on other Government agencies.

1.3.3 Industry

The proposed action should expedite the licensing process and thus reduce licensing delays and costs. Use of the standard format would result in less time and effort in preparing and submitting applications.

1.3.4 Public

There could be a cost reduction to the public as taxpayers and consumers because of the improved efficiency of the licensing process and the subsequent inspection process that NRC must perform at licensed uranium hexafluoride production plants.

1.4 Decision on Proposed Action

Format and content guidance should be furnished for preparing applications for the renewal of licenses for uranium hexafluoride production.

2. TECHNICAL APPROACH

The proposed action is nontechnical in its content; therefore this section is not applicable.

3. PROCEDURAL APPROACH

Several methods of making public the proposed guidance were considered and evaluated. A regulatory guide was selected as the best alternative for the proposed action because it was considered the most effective and efficient.

4. STATUTORY CONSIDERATIONS

4.1 NRC Authority

Authority for the proposed action is derived from the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, as amended, and implemented through the Commission's regulations in Title 10 of the Code of Federal Regulations.

4.2 Need for NEPA Assessment

Issuance or amendment of guides for the implementation of regulations in Title 10, Chapter I, of the Code of Federal Regulations is a categorical exclusion under paragraph 51.22(c)(16) of 10 CFR Part 51. Thus, an environmental impact statement or assessment is not required for this action.

5. RELATIONSHIP TO OTHER EXISTING OR PROPOSED REGULATIONS OR POLICIES

This regulatory guide should be consistent with future standard formats for new license applications for uranium hexafluoride production plants (in contrast to renewals). It would serve as a basis for developing standard review plans for license renewal applications.

6. SUMMARY AND CONCLUSIONS

A regulatory guide should be prepared for the standard format and content of the health and safety section of applications for renewal of licenses for uranium hexafluoride production.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555