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REGULATORY GUIDE

DIRECTORATE OF REGULATORY STANDARDS

REGULATORY GUIDE 3.19

REPORTING OF OPERATING INFORMATION FOR FUEL REPROCESSING PLANTS

A. INTRODUCTION

Section 50.36, "Technical Specifications," of 10 CFR Part 50, "Licensing of Production and Utilization Facilities," requires that each applicant for a license authorizing operation of a production or utilization facility include in his application proposed technical specifications. These technical specifications as approved by the AEC are incorporated into the facility license and are conditions of the license. The technical specifications for fuel reprocessing plants include a section on reporting requirements. In addition to the reporting requirements necessary for compliance with the technical specifications of the license, there are specific reporting requirements included in Part 50 as well as in Parts 20, 40, 70, 71, and 73 of Title 10. For the convenience of licensees, these specific reporting requirements are included in the reporting program described in this guide. Each report discussed in this guide is either required by AEC regulations or is normally specified in licensees' technical specifications. In some cases this program may need to be supplemented or modified because of unique plant design features or other factors. The need for a supplemental or modified program will be determined on an individual-case basis.

B. DISCUSSION

The information provided in the reports discussed herein should be sufficient to permit an assessment by the Commission of all safety-related activities during and following startup of the facility.

In addition to those reports that relate to the safety of operation of the plant, the information on nuclear materials safeguards and on packages used for transportation of radioactive materials that must be reported pursuant to the Commission's regulations is also included.

Fuel reprocessing plants may be constructed in steps to provide a buildup of services timed to meet industry needs, regulatory requirements, and economics. These steps, for example, could include separate construction and startup of facilities for (1) irradiated fuel receipt and storage, (2) uranium and plutonium purification and recovery, (3) neptunium recovery, (4) high-level liquid waste storage, and (5) high-level liquid waste solidification. Reporting is required regarding startup and operation of each service to assure assessment of its effect on the safety of the entire facility.

Some plant operations are maintained continuously from the time of their initial operation through their final decommissioning. These facilities require continued surveillance and are subject to these reporting requirements regardless of the operational status of other plant facilities. For example, cooling and storage of high-level liquid waste must be continued whether or not the primary solvent extraction operation for uranium recovery is in operation.

This guide presents an acceptable reporting program for fuel reprocessing plant licensees. Tables I and II of this guide are compilations of time limits or frequency intervals for submitting routine and nonroutine reports. An acceptable interim reporting program for radioactive effluents and environmental monitoring is presented in a separate guide.¹

C. REGULATORY POSITION

The following reporting program should be used to implement the reporting requirements of 10 CFR Parts 20, 40, 50, 70, 71, and 73 and reporting requirement imposed by the AEC as license conditions including those reports usually required by the technical specifications.

¹ Regulatory Guide 1.21 (Safety Guide 21), "Measuring and Reporting of Effluents from Nuclear Power Plants." Although this guide was prepared for use by reactor licensees, it may be used for interim guidance by reprocessing plant licensees.

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10. General

1. Routine Reports

a. Operations Reports²

(1) Preoperational Reports

A summary report of preoperational testing, including that performed with unirradiated uranium, should be submitted. The report should include results and conclusions of equipment proof tests, shutdown procedure tests, and emergency procedure tests. Recommendations for any corrective actions or equipment modifications indicated by these tests should be included. Other testing may be requested by the Commission on a case-by-case basis to match the peculiarities of specific facilities. Schedules for submitting this information are proposed by the applicant for approval by the Commission. The reports should be submitted in writing to the Deputy Director For Fuels and Materials, Licensing, U.S. Atomic Energy Commission, Washington, D.C. 20545.

(2) Startup Reports

A summary report of plant startup testing should be submitted following receipt of an operating license, following an amendment to the license involving a planned increase in plant throughput, or following modifications or additions that may have significantly altered the performance of the plant. The report should include a description of the measured values of the operating conditions or characteristics obtained during the test program and a comparison of these values with design predictions and specifications. Any corrective actions that were required to obtain satisfactory operation should also be described. Startup reports should be submitted within 90 days following completion of the startup test program.

(3) First Processing Year Operation Report

This report should be submitted within 60 days after completion of the first year of processing operation. This year begins on the date of initial processing of irradiated fuel. This report may be incorporated into the semiannual operating report and should cover the following:

(a) an evaluation of plant performance to date in comparison with design predictions and specifications;

(b) a reassessment of the safety analysis submitted with the license application if measured operating characteristics indicated that there may be substantial variance from prior analyses;³

(c) an assessment of the performance of structures, systems, and components important to safety;

(d) a progress and status report on any items identified as requiring additional information during the operating license review or during the preoperational testing or startup of the facility, including items discussed in the AEC's Safety Evaluation Report and Supplements, items on which additional information was required as conditions of the license, and items identified in the licensee's preoperational or startup reports; and

(e) a report of measured in-plant radiation levels which are greater than those estimated in the final safety analysis report by a factor of two or more.

(4) Semiannual Operations Reports⁴

Routine operating reports covering the operation of the previous 6 months should be submitted within 60 days after January 1 and July 1 of each year. The initial report should be submitted within 60 days after the end of the first six-month period during which initial receipt of irradiated fuel took place. Each report should include the following:

(a) Fuel Receiving and Storage

Amounts, properties, and description of irradiated fuel received, stored, or shipped.

(b) Operations Summary

A summary of operating experience occurring during the reporting period that relates to the safe operation of the facility including a summary of:

(i) processing operations performed and their duration;

(ii) amounts of radioactive material received, transferred, or stored as high-level liquid or solid waste or disposed of as solid waste. Curie content or content of significant isotopes should be stated;

(iii) performance characteristics of safety-related plant structures, systems, and components;

(iv) changes in facility design;

(v) changes in operating procedures which were necessitated by (iii) and (iv) above or which otherwise were required to improve the safety of operations;

(vi) results of any tests and inspections required by the licensee's technical specifications;

(vii) a brief summary of those changes, tests, and experiments requiring authorization from the Commission pursuant to 10 CFR 50.59(a); and

² Reports in this category should be submitted in writing to the Director of the appropriate AEC Regulatory Operations Regional Office, except for the reports in Item 1.a(1) and (2).

³ Previously submitted safety analysis reports may be incorporated by reference.

⁴ A single submittal may be made for a multiple-activity facility. The submittal should combine those sections that are common to all activities at the facility.

(viii) any changes in the plant operating staff for those positions designated as key supervisory personnel positions in the technical specifications.

(c) Shutdown

Descriptive material covering all shutdowns occurring during the reporting period. For each shutdown, information should be provided on:

- (i) the part or parts of the plant shut down and the part or parts remaining in operation, e.g., fuel receiving, waste storage, product recovery;
- (ii) the cause of the shutdown;
- (iii) the method of shutdown, e.g., routine or emergency;
- (iv) duration of the shutdown (in days or hours);
- (v) status of each part of plant during the shutdown, e.g., operational, hot standby, or cleanout;
- (vi) consequences of shutdown, e.g., abnormal radiation levels or releases of radioactive material to the environs; and
- (vii) corrective action taken to prevent repetition, if appropriate.

(d) Maintenance

A discussion of corrective maintenance (excluding preventive maintenance) performed during the reporting period on safety-related systems and components and on systems and components that control the release of radioactive materials to the environs. For any malfunction for which corrective maintenance was required, information should be provided on:

- (i) the system or component involved;
- (ii) the cause of the malfunction;
- (iii) the results and effect on safe operation; and
- (iv) corrective action taken to prevent repetition.

(e) Changes, Tests, and Experiments

A brief description and a summary of the safety evaluation of those changes, tests, and experiments carried out without prior Commission approval, pursuant to the requirements of 10 CFR 50.59(b).

(5) Annual Operations Reports

Reports covering the operation of the previous 12 months should be submitted within the first quarter of each calendar year. The initial report should be submitted within the first quarter of the year

following the year in which initial receipt of irradiated fuel took place. This report may be combined with semiannual operations reports. Each report should include the following:

(a) Occupational Personnel Radiation Exposure

(i) A tabulation of the number of occupational personnel exposures for plant operations personnel (permanent and temporary) in the following exposure increments (in rem) for the reporting period: no measurable exposure, measurable but less than 0.1, 0.1-0.25, 0.25-0.5, 0.5-0.75, 0.75-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, and over 12. A tabulation of the number of personnel receiving more than 3 rem annually and the major cause(s).

(ii) A tabulation of the number of personnel receiving more than 1000 mrem exposure in the reporting period according to duty function [e.g., routine plant operation, surveillance and inspection (regular duty), routine plant maintenance, special plant maintenance (describe maintenance), routine fuel handling, and other job-related exposures.]

(iii) A report of either (1) the total number of individuals for whom personnel monitoring is required under 10 CFR § 20.202(a) during the calendar year or (2) the total number of individuals for whom personnel monitoring was provided during the calendar year.

(b) FSAR Changes

Submission of revised FSAR pages on a replacement page basis appropriately prepared for direct insertion into the applicable FSAR section and describing all safety-related changes in facility design, method of operation, revised safety or transient analysis, or facility equipment additions. Also a listing of effective pages by date of revision or revision number should be submitted.

b. Additional Routine Reporting Requirements

Table I lists routine reports required by 10 CFR Parts 20, 40, 50, 70, and 71, including those listed in Regulatory Position C.1.a.

2. Nonroutine Reports

a. Reporting of Abnormal Events

(1) Abnormal Occurrence Reports

A notification must be made within 24 hours by telephone and telegraph to the Director of the appropriate AEC Regulatory Operations Regional Office, (cc to the Director of Licensing) followed by a written report within 10 days to the Director of the appropriate AEC Regulatory Operations Regional Office in the event of an abnormal occurrence.

Appendix A of this guide, "Standard Format for Reporting Abnormal Occurrences," should be used as guidance when submitting abnormal occurrence reports.

Abnormal occurrences are defined in the licensee's technical specifications and usually include, as a minimum, items (a) through (h) of this paragraph.

(a) A safety system setting less conservative than the limiting setting⁵ established in the technical specifications.

(b) Conditions which result in a limiting condition for operation⁵ not being met.

(c) Abnormal degradation of one of the several barriers designed to confine radioactive materials.

(d) Leakage of product or radioactive waste material from storage tanks into leak monitoring sumps.

(e) An unplanned or uncontrolled release of radioactive material from the site boundary.

(f) Incidents or conditions which prevented or could have prevented the performance of the intended safety function of an engineered safety feature system or protection system.

(g) Inadequacies in the implementation of administrative or procedural controls such that the inadequacy causes or threatens to cause the existence or development of an unsafe condition in connection with the operation of the plant.

⁵ As defined in Regulatory Guide 3.6, "Guide to Content of Technical Specifications for Fuel Reprocessing Plants.

(h) Conditions arising from natural or man-made events that affect or threaten to affect the safe operation of the plant.

(2) Reporting of Unusual Events

A written report should be forwarded within 30 days to the Director of the appropriate AEC Regulatory Operations Regional Office in the event of:

(a) Discovery of any substantial errors in accident analyses, or in the methods used for such analyses, as described in the Safety Analysis Report or in the bases for the technical specifications;

(b) Discovery of any substantial variance from performance specifications contained in the technical specifications or in the Safety Analysis Report; or

(c) Discovery of any condition involving a possible single failure which, for a system intended to be designed against assumed single failures, could result in a loss of the capability of the system to perform its safety function.

b. Additional Nonroutine Reporting Requirements

Table II lists nonroutine reports required by 10 CFR Parts 20, 40, 50, 70, and 73, including those listed in Regulatory Position C.2.a.

TABLE I

REPORTING SUMMARY—ROUTINE REPORTS

Requirement	Report	Timing of Submittal
TS ¹	Preoperational	As scheduled between licensee and AEC.
TS	Startup	Within 90 days following completion of the startup test program.
TS	First Processing Year Operation	Within 60 days after completion of the first year of operation. Year begins on the date of processing irradiated fuel.
TS	Annual Semiannual	Within first quarter of each calendar year. Within 60 days after January 1 and July 1 of each year.
§20.407	Personnel Exposure and Monitoring	Within first quarter of each calendar year.
§20.408	Personnel Exposure on Termination of Employment or Work	Within 30 days after the exposure of the individual has been determined or 90 days after date of termination of employment or work assignment, whichever is earlier.
§40.64(a)	Transfer of Source Material	Promptly upon transfer.
§40.64(a)	Receipt of Source Material	Within 10 days after material is received.
§40.64(b)	Source Material Inventory	Within 30 days after June 30 of each year.
§50.59(b)	Changes, Tests, and Experiments	Annually or at shorter intervals as may be specified in the license.
§70.53	Special Nuclear Material Status	Within 30 days after June 30 and December 31 of each year.
§70.54	Transfer of Special Nuclear Material	Promptly upon transfer.
§70.54	Receipt of Special Nuclear Material	Within 10 days after material is received.
§71.61	Loss of Effectiveness of packaging	Within 30 days after noting loss of effectiveness.

¹ Technical specifications

TABLE II
REPORTING SUMMARY—NONROUTINE REPORTS

Requirement	Report	Notification	Initial Written Report
TS ¹	Abnormal Occurrence	Within 24 hours	Within 10 days
TS	Unusual Events		Within 30 days
§20.405	Overexposures and Excessive Levels of Radiation and Concentration of Radioactive Material		Within 30 days
§20.402	Theft or Loss of Material	Immediately	Within 30 days
§20.403(a)	Severe Accident Involving Licensed Material	Immediately	None required
§20.403(b)	Accident Involving Licensed Material	Within 24 hours	None required
§40.64(c)	Theft or Unlawful Diversion of Source Material	Promptly	Within 15 days
§50.59(d)	Authorization of Changes, Tests, and Experiments	²	
§70.52	Accidental Criticality or Loss of Special Nuclear Material	Promptly	None required
§73.71	Unaccounted for Shipments, Suspected Theft, or Unlawful Diversion of Special Nuclear Material	Immediately	Within 15 days
TS	Special		Within 3 months ³

¹ Technical specifications.

² AEC authorization may be required prior to performing the change, test, or experiment in this category.

³ Special reports covering inspections, tests, and maintenance that are appropriate to assure safe operation of the facility. The frequency and content of these special reports are determined on an individual-case basis designated in the Technical Specifications.

APPENDIX A

STANDARD FORMAT FOR REPORTING ABNORMAL OCCURRENCES

The standard format for submission of abnormal occurrence reports (AOR) identifies the principal information that should be contained in a completed AOR and gives a format for presenting it. In the course of reviewing past AOR's, the AEC Regulatory staff has found a wide variance in the type and detail of information reported. To assure that AOR's submitted are consistent both in format and in the principal

information included, the format for AOR's presented in this Appendix should be used, and the information requested should be submitted when applicable. If investigation is not complete by the time the initial report is submitted, the licensee should so indicate and give estimated time when a supplemental report will be submitted.

STANDARD FORMAT FOR ABNORMAL OCCURRENCE REPORTS

1. Report Number:
- 2a. Report Date:
- 2b. Occurrence Date:
3. Facility:
4. Identification of Occurrence:
5. Conditions Prior to Occurrence:
 - Routine
 - Routine Startup Operation
 - Routine Shutdown Operation
 - Hot Standby
 - Cold Shutdown
 - Other (specify)
6. Description of Occurrence:
7. Designation of Apparent Cause of Occurrence:
 - Design
 - Installation/Construction
 - Procedure
 - Unusual Service Condition Including Environmental
 - Manufacture
 - Operator
 - Component Failure
 - Other (specify)
8. Analysis of Occurrence:
9. Corrective Action:
10. Failure Data:

NOTES TO AOR STANDARD FORMAT

1. Report Number: Abnormal occurrence reports should be numbered sequentially on a calendar-year basis for each facility (or each unit of a multi-unit site) using the facility (unit) docket number as the principal identifier (e.g. Docket Number/Year-Sequential number in calendar year). Supplementary reports should be numbered using alphabetical identifying letters following the principal report number (e.g. Docket Number/Year-Sequential number in calendar year-alphabetical letter identifying supplementary report.)
2. Date: Date of (a) report submitted and (b) occurrence.
3. Facility: Name and location of facility.
4. Identification of Occurrence: The abnormal occurrence should be identified by a short title which identifies the type of abnormal occurrence and the system, component, or event involved. (Regulatory Position C.2.a.1 should be used as a guide for listing the type of abnormal occurrence.)
5. Conditions Prior to Occurrence: The applicable caption should be used followed by a description of plant status prior to the abnormal occurrence. Major plant parameters should be included.
6. Description of Occurrence: A chronological sequence of events should be described in an objective manner. The following should be included:
 - a. Method of detection and time of detection.
 - b. Step-by-step sequence of events identifying all protection system actions and operator actions to bring the situation under control.
7. Designation of Apparent Cause of Occurrence: The

single apparent cause should be identified and narrated. When other causes contributed to the abnormal occurrence, the narrative of the apparent cause should discuss fully the single cause assigned and the contributing causes assigned.

8. **Analysis of Occurrence:** The abnormal occurrence should be analyzed for safety implications. The analysis of effects and the attendant consequences should be supported by sufficient information, as applicable:
- a. Maximum and minimum conditions during transients.
 - b. Equipment malfunction.
 - c. Operator error.
 - d. Damage to systems and components.

9. **Corrective Action:**¹ The following information should be provided:

- a. Corrective action taken (or to be taken) to correct the abnormal occurrence.
- b. Corrective action taken (or to be taken) to prevent repetition of the occurrence and of similar occurrences.

10. **Failure Data:** Where equipment failure is cause of the occurrence or equipment failed as a result of the occurrence the following information should be provided:

- a. Record of previous failures and malfunctions of the affected systems and components or of similar equipment.
- b. Equipment identification—(e.g. component, manufacturer, name plate data).

¹ The cause of the occurrence is described in Item 7, "Designation of Apparent Cause of Occurrence" and the action taken to bring the situation under control is discussed in Item 6, "Description of Occurrences." These items should not be repeated in this discussion.