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

RENEWAL OF FACILITY LICENSE

DOCKET NO. 50-70

THE GENERAL ELECTRIC COMPANY

GENERAL ELECTRIC TEST REACTOR

Amendment No. 16
License No. TR-1

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for renewal of Facility License No. TR-1 filed by the General Electric Company, dated July 9, 1990, as supplemented on December 17, 1990, and August 7, 1992, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations as set forth in 10 CFR Chapter I;
 - B. Construction of the facility was completed in substantial conformity with Construction Permit No. CPTR TR-2 dated January 7, 1959, the provisions of the Act, and the regulations of the Commission;
 - C. The facility will be maintained in conformity with the application, the provisions of the Act, and the regulations of the Commission;
 - D. There is reasonable assurance; (i) that the activities authorized by this license can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - E. The licensee is technically and financially qualified to engage in the activities authorized by this license in accordance with the regulations of the Commission;
 - F. The licensee has satisfied the applicable provisions of 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements," of the Commission's regulations;
 - G. The issuance of this license will not be inimical to the common defense and security or to the health and safety of the public;
 - H. The issuance of this license is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied; and
 - I. The possession of the byproduct materials as authorized by this license will be in accordance with the Commission's regulations in 10 CFR Part 30, including Section 30.33.

2. Accordingly, Facility License No. TR-1 is hereby amended to read as follows:


- A. This amended license applies to the nuclear test reactor (hereinafter the reactor) which is owned by the General Electric Company and located at the Vallecitos Nuclear Center in Alameda County, California, as described in the application for license renewal dated July 9, 1990, as supplemented on December 17, 1990, and August 7, 1992.
- B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses the General Electric Company:
 - (1) Pursuant to Section 104c of the Act and 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," to possess, but not operate, the reactor at the designated location at the Vallecitos Nuclear Center, in accordance with the procedures and limitations described in the application and in this license.
 - (2) Pursuant to the Act and 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," to possess, but not to separate, such byproduct material as may have been produced by operation of the reactor.
- C. This license shall be deemed to contain and is subject to the conditions specified in Parts 20, 30, 50 and 51 of 10 CFR Chapter 1, to all applicable provisions of the Act, and to the rules, regulations and orders of the Commission now or hereafter in effect and to the additional conditions specified below:
 - (1) Operation

The licensee shall not operate the reactor nor install fuel or fueled experiments within the reactor core or core area.
 - (2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 16, are hereby incorporated in the license. The licensee shall possess and maintain the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall expire at midnight, January 26, 2016.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in dark ink, appearing to read "Bruce A. Boger", with a stylized flourish at the end.

Bruce A. Boger, Director
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Date of Issuance: September 30, 1992

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APPENDIX A
FACILITY LICENSE NO. TR-1
TECHNICAL SPECIFICATIONS
GENERAL ELECTRIC TEST REACTOR
VALLECITOS, CALIFORNIA
OCTOBER 1985

DOCKET NO. 50-70

APPENDIX A
TECHNICAL SPECIFICATIONS
LICENSE TR-1
GETR

1.0 Definitions

- 1.1 Channel. A channel is the combination of sensor, line, amplifier, and output devices which are connected for the purpose of measuring the value of a parameter.
- 1.2 Channel test. A channel test is the introduction of a signal into the channel for verification that it is operable.
- 1.3 Channel calibration. A channel calibration is an adjustment of the channel such that its output corresponds with acceptable accuracy to known values of the parameter which the channel measures. Calibration shall encompass the entire channel, including equipment actuation, alarm or trip, and shall be deemed to include a channel test.
- 1.4 Channel check. A channel check is a qualitative verification of acceptable performance by observation of channel behavior. This verification, where possible, shall include comparison of the channel with other independent channels or systems measuring the same variable.
- 1.5 Confinement. Confinement means a closure on the overall facility which controls the movement of air into it and out through a controlled path.
- 1.6 Operable. Operable means a component or system is capable of performing its intended function.
- 1.7 Operating. Operating means a component or system is performing its intended function.
- 1.8 Shall, should and may. The word "shall" is used to denote a requirement; the word "should" to denote a recommendation; and the word "may" to denote permission, neither a requirement nor a recommendation.
- 1.9 Facility Specific Definitions
 - a. Restricted activity. A restricted activity is an activity inside the reactor building involving activated and/or contaminated reactor facility structures, components or systems that could cause within the reactor building airborne radioactive material concentrations in excess of the limits in 10CFR20, Appendix B, Table 1, Column 1.
 - b. Reactor building. The reactor building is the same structure described in the SAR as the containment building. The new name is more appropriate, as a leak-tight building with isolation capability is not required for the shut down facility.

- c. Reactor facility. The reactor facility is defined as the reactor building and its ventilation system, the tank farm, the experiment exhaust system (EES) tanks, north half of Building 202, and contaminated piping connecting these components.

2.0 Safety Limits and Limiting Safety System Settings

2.1 Safety Limits

Not applicable.

2.2 Limiting Safety System Settings

Not applicable.

3.0 Limiting Conditions For Operation

3.1 Reactor Core Parameters

Not applicable.

3.2 Reactor Control and Safety System

Not applicable.

3.3 Coolant Systems

Not applicable.

3.4 Confinement

3.4.1 Applicability

This specification applies to the reactor building.

3.4.2 Objective

The objective of this specification is to define the activities which require confinement and to specify the action taken and the equipment provided to achieve confinement.

3.4.3 Specifications

3.4.3.1 Activities That Require Confinement

Restricted activities are defined in Section 1.0, Paragraph 1.9.a. These activities require confinement.

3.4.3.2 Equipment To Achieve Confinement

- (1) When the ventilation system is not operating, the reactor building shall be maintained in a condition such that there are no airflow pathways open directly to the environs except the airlock doorways when the doors are open.
- (2) The airlock outer doors shall be kept closed except during personnel access or egress or while equipment is being passed through the doorway.
- (3) The airlock outer doors shall be locked or blocked closed to prevent unauthorized entry except when authorized personnel are inside the reactor building or outside with the door in view.
- (4) When restricted activities are in progress, the direction of airflow through pathways open directly to the environs shall be into the reactor building and discharge to the environs shall be through an operating ventilation system.

3.4.4 Bases

Measurements of airborne radioactivity by monitors and samplers inside the reactor building and in the ventilation discharge indicate that the reactor building in its present condition does not require a confinement system. Because of the activation and contamination levels, it is possible to perform activities, i.e., restricted activities, that could cause airborne concentrations in excess of 10CFR20 limits. Specification 3.4.3.1 ensures that a confinement system will be provided for such activities.

The restrictions and limitations in Specification 3.4.3.2 are necessary to provide assurance that the reactor building and ventilation system provide an effective confinement system.

3.5 Ventilation Systems

3.5.1 Applicability

This specification applies to the reactor building ventilation system.

3.5.2 Objective

This specification describes the minimum requirements of the reactor building ventilation system.

3.5.3 Specification

- (1) A reactor building ventilation system shall be operating whenever restricted activities are in progress.
- (2) The reactor building ventilation system shall discharge through a particulate filter system.

- (3) When the system is required to be operable, the exhaust air downstream of the filters shall be continuously monitored or sampled to show that the specified release rate limits in Specification 3.7.3.2 are not exceeded. If the release rate limits are exceeded, activities causing the release will be discontinued and corrective action taken to ensure further release is within limits.
- (4) The ventilation system shall be capable of maintaining the direction of airflow into the reactor building through any existing pathways open directly to the environs.

3.5.4 Bases

The extremely small source term at the GETR is adequately confined by the reactor building. Whenever restricted activities are in progress, a filtered and monitored ventilation system provides assurance release rates are maintained within limits.

3.6 Emergency Power

Not applicable.

3.7 Radiation Monitoring Systems and Effluents

3.7.1 Applicability

This specification applies to those devices either permanently installed or portable and used to detect radiation and/or contamination levels and to the effluents released through the reactor building ventilation system.

3.7.2 Objective

To describe the minimum radiological instrument capabilities that must be available for use at the reactor facility and to state the airborne radioactivity limits for effluent released through the reactor building ventilation system.

3.7.3 Specifications

3.7.3.1 Monitoring Systems

The radiological instrumentation capability that must be available for use at the reactor facility are given in Table 3-1. These instruments shall perform the following functions.

- (1) Stack Particulate Sampling (Monitoring) System. During performance of restricted activities, the stack effluent shall be continuously monitored or sampled.

- (2) Airborne Activity Monitors. Mobile and/or stationary continuous air monitors and samplers shall be used as necessary in the reactor building and are located as necessary to support the activities in progress.

Whenever such monitors are inoperable, portable instruments, surveys or analyses may be substituted for any of the normally installed monitors in Section 3.7.3.1 for periods up to 48 hours.

TABLE 3-1

GETR Radiological Instrumentation

a. Portable Instrumentation

<u>Activity Detected</u>	<u>Maximum Range</u>
Beta-Gamma	250 R/h; 1,000 Rad/h
Gamma	1,000 R/h
Beta-Gamma	1,000 R/h; 20,000 Rad/h
Beta-Gamma	70,000 cpm

b. Fixed Instrumentation

	<u>Activity Detected</u>	<u>Maximum Range</u>
Stack Particulate	Beta-Gamma	10^5 cps
CAM's (continuous air monitor)	Beta-Gamma	50,000 cpm

3.7.3.2 Effluents

The limits for radioactive material discharged through the reactor building ventilation system to the atmosphere shall be as specified in Table 3-2.

TABLE 3-2

Isotope Group	Stack Release Rate Limits	
	Annual Average ($\mu\text{Ci/sec}$)	Short-Term ($\mu\text{Ci/sec}$)
Particulate $> 8d T_{\frac{1}{2}}$		
Beta-Gamma	$1.04 \times 10^{11} \text{ MPC}_a/1400$	$1.04 \times 10^{12} \text{ MPC}_a/700$
Alpha	$1.04 \times 10^{11} \text{ MPC}_a/1400$	$1.04 \times 10^{12} \text{ MPC}_a/700$

where MPC_a = the concentration in $\mu\text{Ci/ml}$ shown in Table II, Appendix B, 10 CFR Part 20.

Liquid effluents exceeding the unconditional release concentration limits of Column 2 of Table II, Appendix B, 10 CFR Part 20 shall ultimately be disposed of as solid waste. When underground tanks are used for storage of liquid effluents, a surveillance program to detect leakage shall be maintained.

3.7.4 Bases

The instrumentation described in 3.7.3.1 will provide assurance that the concentration of airborne radioactive material in the working areas and the stack effluent are measured and that when there is a potential for the creation of high gamma fields as a result of the conduct of restricted activities, the radiation level will be monitored and an alarm actuated if necessary.

The stack release rate limits are based on computer calculated dilution-dispersion factors using two years of site recorded meteorological data.

The above listed annual average contains a reduction factor of 2 to account for discharges from other VNC stacks and a reduction factor of 700 to account for reconcentration in the environs.

3.8 Experiments

Not applicable.

3.9 Facility Specific LCO

Not applicable.

4.0 Surveillance Requirements

4.1 Reactor Core Parameters

Not applicable.

4.2 Reactor Control and Safety System

Not applicable.

4.3 Coolant Systems

Not applicable.

4.4 Confinement

4.4.1 Applicability

This specification applies to the surveillance requirements for the reactor building confinement system.

4.4.2 Objective

To assure that the reactor building is maintained in a condition that provides an effective boundary for the confinement system.

4.4.3 Specifications

- (1) During periods when the ventilation system has not operated, the facility records shall be reviewed and the reactor building shall be visually inspected at least annually to determine that there are no pathways open directly to the environs except the airlock doorways. This determination also shall be made prior to the initiation of any restricted activities.
- (2) Weekly a check shall be made to determine the airlock outer doors are locked or blocked closed whenever no one is inside the reactor building.
- (3) Whenever the reactor building ventilation system is required to be operating, there shall be verification at least weekly that the direction of flow through pathways open directly to the environs is into the reactor building.

4.4.4 Bases

Compliance with these specifications provides assurance that the reactor building is maintained as an effective confinement boundary.

4.5 Ventilation Systems

4.5.1 Applicability

Applies to the reactor building ventilation system.

4.5.2 Objective

To specify surveillance requirements that will provide assurance the reactor ventilation system is operable when required.

4.5.3 Specification

- (1) Particulate filters shall be visually inspected and tested by the standard filter dioctyl phthalate (DOP) or dioctyl sebacate (DOS) efficiency test for 99.97% removal of 0.3 μm particles by the vendor. Each filter shall be visually inspected prior to and after installation and at least annually thereafter.
- (2) A channel calibration of the ventilation effluent sampler or monitor shall be performed prior to placing into service, after major maintenance, and at least annually while in service. A channel check shall be performed monthly while the sampler or monitor is in service. These tests need not be performed if operation of the ventilation system was not required during the year.
- (3) At least annually direction of airflow through pathways open directly to the environs shall be verified to be into the reactor building while the ventilation system is operating. This test also shall be performed prior to the initiation of any restricted activity; it need not be performed if operability of the ventilation system was not required during the year.

4.6 Emergency Power

Not applicable.

4.7 Radiation Monitoring Systems and Effluents

4.7.1 Applicability

This specification applies to the equipment and systems installed to detect radiation and/or contamination, e.g., laboratory counting instruments and portable radiation measuring instrumentation used for the reactor facility.

4.7.2 Objective

To describe check and calibration frequencies of laboratory counting instruments and portable radiation measuring instrumentation.

4.7.3 Specifications

- (1) Portable monitoring instruments shall be calibrated upon initial acquisition, after major maintenance, and at least annually.
- (2) Background and efficiency using standard sources shall be measured at least quarterly on all laboratory instruments used for counting health physics samples.

4.7.4 Bases

These specifications provide assurance that monitoring and analytical instrumentation will be functional when needed.

4.8 Experiments

Not applicable.

4.9 Facility Specific Surveillance

Not applicable.

5.0 Design Features

5.1 Site and Facility Description

The GETR facility shall be located on the site of the Vallecitos Nuclear Center which is owned and controlled by the General Electric Company. The minimum distance from the facility to the posted site boundary shall be approximately 2,800 feet. The restricted area as defined in 10CFR20 of the Commission's regulations shall be the Vallecitos Nuclear Center.

5.2 Reactor Coolant System

Not applicable.

5.3 Reactor Core and Fuel

Not applicable.

5.4 Fissionable Material Storage

Not applicable.

6.0 Administrative Controls

6.1 Organization

6.1.1 Structure

The organization for the management and operation of the reactor facility shall include the structure indicated in Figure 1. Other organizational levels/staffing may be added to meet specific facility needs. Additional description of levels follows:

- (1) Level 1. Individual responsible for the reactor facility's licenses (i.e., Organizational Head).
- (2) Level 2. Individual responsible for reactor facility activities (i.e., Facility Manager).
- (3) Level 3. Individual responsible for day-to-day supervision (i.e., Facility Supervisor).

As indicated in Figure 1, the review and independent examination group shall report to Level 1. Radiation safety personnel shall report to Level 2 or higher.

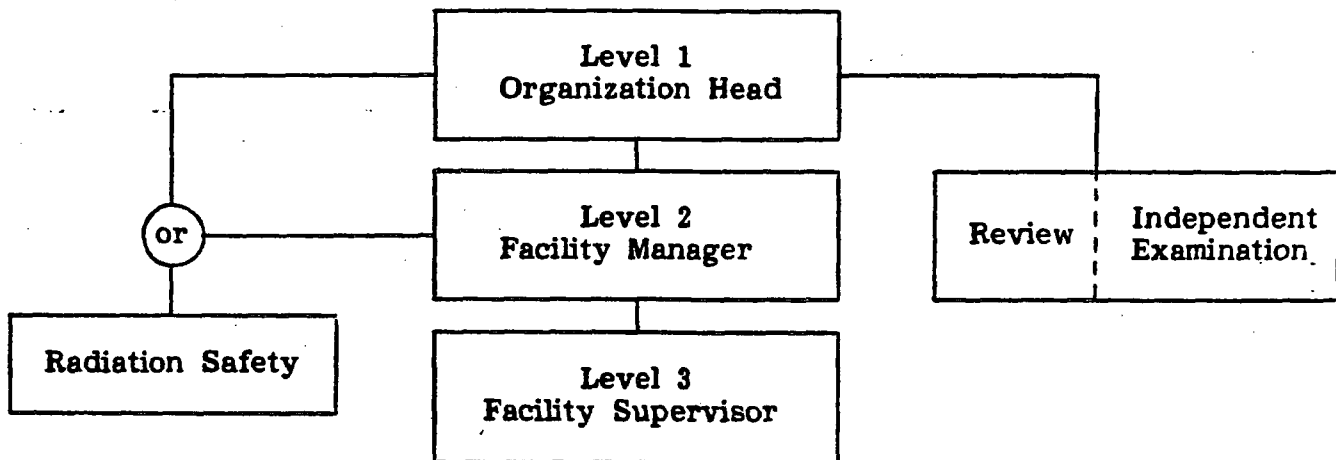


Figure 1. Organization Chart

6.1.2 Responsibility

Responsibility for the safety of the reactor facility shall be with the chain of command established in Figure 1. Individuals at the various management levels, in addition to having responsibility for the policies and activities conducted in the reactor facility, shall be responsible for safeguarding the public and facility personnel from undue radiation exposures and for adhering to all requirements of the facility license and technical specifications.

In all instances responsibilities of one level may be assumed by designated alternates or by higher levels, conditional upon appropriate qualifications.

6.2 Review and Independent Examination

6.2.1 Composition and Qualification

Independent review functions shall be performed by technically qualified personnel responsible to a management position other than the facility manager.

6.2.2 Charter and Rules

The independent review function shall be performed under a written charter or directive containing the following information as a minimum:

- a. subjects reviewed;
- b. responsibilities;
- c. authorities;
- d. records;
- e. other matters as may be appropriate.

6.2.3 Review Function

Activities requiring independent review shall include the following:

- a. Proposed activities that could affect personnel or facility safety or result in an uncontrolled release of radioactivity in excess of 10CFR20 limits, to be conducted without prior NRC approval, and reviewed and approved pursuant to 10CFR50.59 to verify the proposed activity does not constitute a change in the Technical Specifications or an unreviewed safety question.
- b. Proposed changes to the procedures or the facility, to be completed without prior NRC approval, reviewed and approved pursuant to 10CFR50.59 to verify the activity does not constitute a change in the Technical Specifications or an unreviewed safety question.
- c. All new procedures and revisions thereto having safety significance.
- d. Proposed changes to the Technical Specifications or the facility license.

- e. Violations of the Federal regulations, Technical Specifications, and facility license requirements.
- f. Unusual or abnormal occurrences which are reportable to the NRC under provisions of the Federal regulations.

6.2.4 Independent Examination Function

The independent examination function shall include selective (but comprehensive) examination of activities records and other documents. Discussions with cognizant personnel and observation of operations also should be used as appropriate. In no case shall personnel immediately responsible to Level 2 management perform the examination. The following items shall be examined:

- (1) Facility activities for conformance to the technical specifications and license, at least once per calendar year (interval between examinations not to exceed 15 months).
- (2) The qualifications of the staff, at least once every other calendar year (interval between examinations not to exceed 30 months).
- (3) The results of action taken to correct those deficiencies that may occur in the reactor facility equipment, systems, structures, or methods of operations that affect facility safety, at least once per calendar year (interval between examinations not to exceed 15 months).
- (4) The reactor facility emergency plan and implementing procedures, at least once every other calendar year (interval between examinations not to exceed 30 months).

Deficiencies uncovered that affect facility safety shall immediately be reported to Level 2 management. A written report of the findings of the examination shall be submitted to Level 2 management and the manager of the radiation safety function within three months after the examination has been completed.

6.3 Procedures

Written procedures, including ALARA, shall be prepared and approved prior to initiating any of the activities listed in this section. The procedures shall be reviewed by the review function (see 6.2.3) and approved by Level 2 management or designated alternates, and such reviews and approvals shall be documented in a timely manner. Several of the following activities may be included in a single manual or set of procedures or divided among various manuals or procedures.

- (1) Routine maintenance of major components of systems that could have an effect on facility safety.
- (2) Surveillance tests and calibrations required by the technical specifications or those that may have an effect on facility safety.

- (3) Personnel radiation protection, consistent with applicable regulations.
- (4) Administrative controls for maintenance and for the conduct of activities that could affect facility safety.
- (5) Implementation of required plans such as emergency or security plans.

Staff shall conduct activities utilizing the published and approved procedures except as noted below:

Substantive changes to the above procedures shall be made effective only after documented review by the review group and approval by Level 2 or designated alternates. Minor modifications to the original procedures which do not change their original intent may be made by Level 3 or higher, but the modifications must be approved by Level 2 or designated alternates within 14 days. Temporary one-time deviations from the procedures may be made by Level 3 in order to deal with special or unusual circumstances or conditions. Such deviations shall be documented and reported to Level 2 or designated alternates. All changes (except one-time deviations) shall be incorporated into the written activities procedures.

6.4 Experiments Review and Approval

Not applicable.

6.5 Required Actions

6.5.2 Action To Be Taken In the Event of An Occurrence of the Type Identified In 6.6.2(1)a. and 6.6.2(1)b.

- (1) Reactor facility conditions shall be returned to normal or the activities in progress stopped. If it is necessary to stop the activities in progress to correct the occurrence, operations shall not be resumed unless authorized by Level 2 or designated alternates.
- (2) Occurrence shall be reported to Level 2 or designated alternates and to the NRC as required.
- (3) Occurrence shall be reviewed by the review function.

6.6 Reports

All reports shall be addressed to the U. S. Nuclear Regulatory Commission Washington, D.C. 20555; Attention: Document Control Desk, with a copy to the Regional Administrator, Region V.

6.6.1 Annual Report

Annually submit to the NRC a report containing the following:

- (1) A narrative summary of facility activities.
- (2) Tabulation of major preventive and corrective maintenance operations having safety significance.

- (3) A brief description of major changes in the reactor facility and procedures and activities significantly different from those performed previously and not described in the Safety Analysis Report, and a summary of the safety evaluation that shows no unreviewed safety questions were involved.
- (4) A summary of the nature and amount of radioactive effluents released or discharged to environs beyond the effective control of the licensee as determined at or before the point of such release or discharge. The summary shall include to the extent practicable an estimate of the major individual radionuclides present in the effluent. If the estimated average release after dilution or diffusion is less than 25 percent of the concentration allowed or recommended, a statement to this effect is sufficient.
- (5) A summarized result of environmental surveys performed outside the facility.

6.6.2 Special Reports

Special reports used to report unplanned events as well as planned major facility and administrative changes shall be submitted in accordance with the following schedule:

- (1) There shall be a report not later than the following working day by telephone and confirmed in writing by telegraph or similar conveyance to the NRC to be followed by a written report that described the circumstances of the event within 14 days of any of the following:
 - a. Release of radioactivity from the site above allowed limits (see 6.5.2).
 - b. Any of the following (see 6.5.2):
 - (i) Activities in violation of limiting conditions for conduct of activities established in the technical specifications unless prompt remedial action is taken.
 - (ii) An observed inadequacy in the implementation of administrative or procedural controls such that the inadequacy causes or could have caused the existence or development of an unsafe condition with regard to facility operations.
- (2) A written report within 30 days to the NRC of:
 - a. Permanent changes in the facility organization involving Level 1-2 personnel.
 - b. Significant changes in the accident analysis as described in the Safety Analysis Report.

6.7 Records

Records may be in the form of logs, data sheets, or other suitable forms. The required information may be contained in single or multiple records or a combination thereof.

6.7.1 Records To Be Retained For A Period of At Least Five Years Or For the Life of the Component Involved If Less Than Five Years

- (1) Normal facility operation (but not including supporting documents such as checklists, log sheets, etc., which shall be maintained for a period of at least one year).
- (2) Principal maintenance activities.
- (3) Reportable occurrences.
- (4) Surveillance activities required by the Technical Specifications.
- (5) Reactor facility radiation and contamination surveys where required by applicable regulations.
- (6) Approved changes in operating procedures.
- (7) Records of meeting and independent examination reports of the review and independent examination group.

6.7.2 Records To Be Retained For the Lifetime of the Reactor Facility

(NOTE: Applicable annual reports, if they contain all of the required information, may be used as records in this section.)

- (1) Gaseous and liquid radioactive effluents released to the environs.
- (2) Off-site environmental-monitoring surveys required by the Technical Specifications.
- (3) Radiation exposure for all personnel monitored.
- (4) Drawings of the reactor facility.
- (5) Records of disposal of licensed material.