Georgia Power

POWER GENERATION DEPARTMENT

VOGTLE ELECTRIC GENERATING PLANT

TRAINING LESSON PLAN

TITLE:	DESIGN FEATURES SECTION 5	NUMBER:	LO-LP-39216-00
PROGRAM:	LICENSED OPERATOR TRAINING	REVISION:	0
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INSTRUCTOR GUIDELINES

WHITE BOARD WITH MARKERS

I. PURPOSE STATEMENT:

TO TEACH THE USE AND APPLICABILITY OF THE DESIGN FEATURES, SECTION 5 OF TECHNICAL SPECIFICATIONS

II. LIST OF OBJECTIVES:

1. The student will be able to list the definition of Exclusion Area and Low Population Zone from 10CFR100.

2. The student will be able to list the design pressure and temperature of containment.

3. The student will be able to list the design features of the fuel including number of assemblies, rods per assembly, active fuel length, total weight and maximum enrichments.

4. The student will be able to list the design features for control rods including percentage composition and cladding material.

5. The student will be able to list the design pressure and temperatures for the RCS and pressurizer.

6. The student will be able to list the design features of the spent fuel storage racks including K_{eff} when flooded with unborated water, center to center distance, drainage and capacity, and the K_{eff} for new fuel storage assuming aqueous foam moderation.

REFERENCES:

TECHNICAL SPECIFICATIONS
SECTION 5 DESIGN FEATURES

10CFR100

III. LESSON OUTLINE:

NOTES

I. INTRODUCTION

A. Design Features

1. Those features that cannot be changed

a. Would have significant effect on safety

2. Not covered in previous tech specs.

3. Materials of construction or geometric arrangements

II. PRESENTATION

A. Site

1. Exclusion Area - Figure 5.1-1

a. Required for 10CFR100

b. Person standing at outer periphery

1) Less than 25 Rem W.B.

2) Less than 300 Rem Thyroid from iodine

3) For two hours after accident

2. Low Population Zone

a. Also required by 10CFR100

b. Person at outer boundary

1) Less than 25 Rem W.B.

2) Less than 300 Rem to thyroid from iodine

3) For entire passage of cloud

B. Containment

1. Steel lined reinforced concrete structure

2. Cylindrical shape and dome roof

III. LESSON OUTLINE:

NOTES

3. Dimensions

a. Inside diameter - 140 feet

b. Inside height - 226 feet

c. Minimum thickness

1) Walls - 3 ft. 9 in.

2) Roof - 3 ft. 9 in.

3) Basement - 8 ft. 3 in.

4) Instrumentation cavity - 8 ft.

5) Steel liner - 1/4 inch

d. Net free volume 2.75×10^6 ft^3

4. Design Parameters

a. Pressure - 52 psig

b. Temperature - 400°F

C. Reactor Core

1. Fuel Assemblies

a. 193 fuel assemblies

1) Each with 264 fuel rods (17 x 17) - 25

2) Clad with Zirc 4

3) Active fuel length 144 inches

4) Maximum weight 1766 grams Uranium

5) Initial fuel load enrichment maximum of 3.2 W% U-235

6) Refuel fuel load enrichment maximum of 3.5 W% U-235.

III. LESSON OUTLINE:

NOTES

2. Control Rod Assemblies

a. 53 full length assemblies

b. 142 inches of absorber material

1) 95.5% Natural Hafnium

2) 4.5% Zirconium

3) Clad with stainless steel

D. Reactor Coolant System

1. Maintained with code requirements

a. FSAR Chapter 2

2. Design Pressure 2485 psig

3. Design Temperature

a. RCS 650°F

b. Pressurizer 680°F

4. Volume - steam and water 12, 240 ±100 ft^3

a. At T_{ave} 588.5°F

E. Meteorological Tower Location

1. Figure 5.1-1

F. Fuel Storage

1. Criticality

a. Spent fuel racks

1) K_{eff} less than or equal to .95

2) Flooded with unborated water

3) 10.6 inch center to center distance between spent fuel assemblies

III. LESSON OUTLINE:

NOTES

b. New fuel stored dry

1) K_{eff} less than or equal to .98

2) Assume aqueous foam moderation

2. Drainage

a. Designed to prevent inadvertent draining below 194' 1½"

3. Capacity

a. Maximum of 288 spent fuel assemblies

G. Component Cyclic or Transient Limits (Table 5.7-1)

1. Reactor Coolant System

a. Heatup cycles at less than 100°F/hour or cooldown at less than 100°F/hour

1) 200

b. Pressurizer cooldown cycles less than or equal to 200°F/hour

1) 200

c. Loss of load without immediate reactor or turbine trip

1) 80

d. Loss of offsite AC power

1) 40

e. Partial loss of flow - one loop

1) 80

f. Reactor trip cycles

1) 400

III. LESSON OUTLINE:

NOTES

g. Inadvertent auxiliary spray actuation cycles

1) 10

h. Leak tests - 2485 psig

1) 50

i. Hydrostatic pressure tests - 3107 psig

1) 5

2. Secondary

a. Steam line break greater than 6 inches

1) 1

b. Hydrostatic pressure tests - 1481 psig

1) 5

III. SUMMARY

A. Site

1. Exclusion Area

2. Low Population Zone

B. Containment

1. Configuration

2. Design Pressure and Temperature

C. Reactor Core

1. Fuel Assemblies

2. Control Rod Assemblies

D. Reactor Coolant System

1. Design Pressure and Temperature

2. Volume

III. LESSON OUTLINE:

NOTES

E. Meteorological Tower Location

F. Fuel Storage

1. Criticality

2. Drainage

3. Capacity

G. Component Cyclic or Transient Limits

at the start of the event and that contributed to the event.

(C) Dates and approximate times of occurrences.

(D) The cause of each component or system failure or personnel error, if known.

(E) The failure mode, mechanism, and effect of each failed component, if known.

(F) The Energy Industry Identification System component function identifier and system name of each component or system referred to in the LER.

(*1*) The Energy Industry Identification System is defined in: IEEE Std 803-1983 (May 16, 1983) Recommended Practices for Unique Identification Plants and Related Facilities—Principles and Definitions.

(*2*) IEEE Std 803-1983 has been approved for incorporation by reference by the Director of the Federal Register. A notice of any changes made to the material incorporated by reference will be published in the FEDERAL REGISTER. Copies may be obtained from the Institute of Electrical and Electronics Engineers, 345 East 47th Street, New York, NY 10017. A copy is available for inspection and copying for a fee at the Commission's Public Document Room, 1717 H Street, NW., Washington, D.C. and at the Office of the Federal Register, 1100 L St. NW., Washington, D.C.

(G) For failures of components with multiple functions, include a list of systems or secondary functions that were also affected.

(H) For failure that rendered a train of a safety system inoperable, an estimate of the elapsed time from the discovery of the failure until the train was returned to service.

(I) The method of discovery of each component or system failure or procedural error.

(J)(*1*) Operator actions that affected the course of the event, including operator errors, procedural deficiencies, or both, that contributed to the event.

(*2*) For each personnel error, the licensee shall discuss:

(*i*) Whether the error was a cognitive error (e.g., failure to recognize the actual plant condition, failure to realize which systems should be functioning, failure to recognize the true nature of the event) or a procedural error;

(*ii*) Whether the error was contrary to an approved procedure, was a direct result of an error in an approved procedure, or was associated with an activity or task that was not covered by an approved procedure;

(*iii*) Any unusual characteristics of the work location (e.g., heat, noise) that directly contributed to the error; and

(*iv*) The type of personnel involved (i.e., contractor personnel, utility-licensed operator, utility nonlicensed operator, other utility personnel).

(K) Automatically and manually initiated safety system responses.

(L) The manufacturer and model number (or other identification) of each component that failed during the event.

(3) An assessment of the safety consequences and implications of the event. This assessment must include the availability of other systems or components that could have performed the same function as the components and systems that failed during the event.

(4) A description of any corrective actions planned as a result of the event, including those to reduce the probability of similar events occurring in the future.

(5) Reference to any previous similar events at the same plant that are known to the licensee.

(6) The name and telephone number of a person within the licensee's organization who is knowledgeable about the event and can provide additional information concerning the event and the plant's characteristics.

(c) *Supplemental information.* The Commission may require the licensee to submit specific additional information beyond that required by paragraph (b) of this section if the Commission finds that supplemental material is necessary for complete understanding of an unusually complex or significant event. These requests for supplemental information will be made in writing and the licensee shall submit the requested information as a supplement to the initial LER.

(d) *Submission of reports.* Licensee Event Reports must be prepared on

Form NRC 366 and submitted within 30 days of discovery of a reportable event or situation to the U.S. Nuclear Regulatory Commission, Document Control Desk, Washington, D.C. 20555. The licensee shall also submit an additional copy to the appropriate NRC Regional Office listed in Appendix A to Part 73 of this chapter.

(e) *Report legibility.* The reports and copies that licensees are required to submit to the Commission under the provisions of this section must be of sufficient quality to permit legible reproduction and micrographic processing.

(f) *Exemptions.* Upon written request from a licensee including adequate justification or at the initiation of the NRC staff, the NRC Executive Director for Operations may, by a letter to the licensee, grant exemptions to the reporting requirements under this section.

(g) *Reportable occurrences.* The requirements contained in this section replace all existing requirements for licensees to report "Reportable Occurrences" as defined in individual plant Technical Specifications.

[48 FR 33858, July 26, 1983]

US/IAEA Safeguards Agreement

§ 50.78 Installation information and verification.

Each holder of a construction permit shall, if requested by the Commission, submit installation information, permit verification thereof by the International Atomic Energy Agency, and take such other action as may be necessary to implement the US/IAEA Safeguards Agreement, in the manner set forth in §§ 75.6 and 75.11 through 75.14 of this chapter.

[45 FR 50711, July 31, 1980]

Transfers of Licenses—Creditors' Rights—Surrender of Licenses

§ 50.80 Transfer of licenses.

(a) No license for a production or utilization facility, or any right thereunder, shall be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of the license to any person, unless the Commission shall give its consent in writing.

(b) An application for transfer of a license shall include as much of the information described in §§ 50.33 and 50.34 of this part with respect to the identity and technical and financial qualifications of the proposed transferee as would be required by those sections if the application were for an initial license, and, if the license to be issued is a class 103 license, the information required by § 50.33a. The Commission may require additional information such as data respecting proposed safeguards against hazards from radioactive materials and the applicant's qualifications to protect against such hazards. The application shall include also a statement of the purposes for which the transfer of the license is requested, the nature of the transaction necessitating or making desirable the transfer of the license, and an agreement to limit access to Restricted Data pursuant to § 50.37. The Commission may require any person who submits an application for license pursuant to the provisions of this section to file a written consent from the existing licensee or a certified copy of an order or judgment of a court of competent jurisdiction attesting to the person's right (subject to the licensing requirements of the Act and these regulations) to possession of the facility involved.

(c) After appropriate notice to interested persons, including the existing licensee, and observance of such procedures as may be required by the Act or regulations or orders of the Commission, the Commission will approve an application for the transfer of a license, if the Commission determines:

(1) That the proposed transferee is qualified to be the holder of the license; and

(2) That transfer of the license is otherwise consistent with applicable provisions of law, regulations, and orders issued by the Commission pursuant thereto.

(42 U.S.C. 2132-2135, 2239)

[26 FR 9546, Oct. 10, 1961, as amended at 35 FR 19661, Dec. 29, 1970; 38 FR 3956, Feb. 9, 1973]