



H. B. ROBINSON
SEG PLANT

TITLE

H. B. ROBINSON STEAM ELECTRIC PLANT

UNIT NO. 2

TRAINING INSTRUCTION NO. 203

SENIOR REACTOR OPERATOR REPLACEMENT TRAINING PROGRAM

REVISION 0

REV.	APPROVED BY	DATE	REV.	APPROVED BY	DATE	REV.	APPROVED BY	DATE

Recommend By:

C. Belk

5-12-80

DATE

Approved By:

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5/25/80

DATE

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1.0 PURPOSE:

The purpose of the H. B. Robinson Senior Reactor Operator Replacement Training Program is to ensure that senior reactor operator replacement personnel receive sufficient training to meet or exceed the requirements of ANSI Standard N18.1-1971, 10 CFR 55, and revised NRC criteria for Operator Training and Licensing dated March 28, 1980. It is intended that graduates of this program will be prepared to pass the NRC hot license examination for Senior Reactor Operator and to supervise the safe and efficient operation of the H. B. Robinson Unit No. 2.

2.0 PROCEDURE:

Prior to participating in an NRC Senior Reactor Operator license examination, each candidate shall:

- a. Hold a high school diploma or its equivalent.
- b. Have the following experience:
 1. Four years of responsible power plant experience. Responsible power plant experience should be that obtained as a control room operator (fossil or nuclear) or as a power plant staff engineer involved in the day-to-day activities of the facility (prior to application).
 2. A maximum of two years' power plant experience may be fulfilled by academic or related technical training on a one-for-one time basis.
 3. Two years shall be nuclear power plant experience (prior to application).
 4. Six months shall be at the H. B. Robinson Unit No. 2 power plant (prior to application).

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2.0 PROCEDURE (Continued)

- c. Hold or have held a valid NRC operator license or senior reactor operator license on this plant or a similar plant for 1 year (prior to application).
- d. Have three months of shift training as an extra man on shift (prior to application).
- e. Complete the following additional training.

The Senior Reactor Operator Training Program shall consist of three phases:

(1) On-site lectures, (2) On-the-job training, and (3) Review and evaluation.

Following is a discription of each phase of training.

2.1 Phase I - On-Site Lectures

This phase will consist of formal classroom lectures. Candidates will be removed from shift rotation and placed in a full-time training status. Instruction during this phase will include, but will not be limited to the following topics:

- a. Reactor Theory
 - 1. Fission process
 - 2. Neutron multiplication
 - 3. Source and control rod effects
 - 4. Reactivity coefficients
 - 5. Critical conditions
 - 6. Specific quantitative and qualitative values for the Robinson Plant and will emphasize the understanding and utilization of mathematical expressions governing reactor behavior.
- b. Radioactive Material Handling, Disposal, and Hazards.

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2.0 PROCEDURE (Continued)

1. 10 CFR 20
 2. Radiation Protection Manual
 3. Radiation Work Permits
 4. Radioactive discharge - procedures, limitations, precautions
 5. Calculations
 - (a) Time, distance, shielding
 - (b) Radioactive decay
 - (c) Dose and dose rate conversions
 6. Radiation processing and monitoring equipment
- c. Specific Operating Characteristics - This category will constitute a review of operating characteristics and proceed beyond the scope of knowledge required for routine plant operation. It will include the use of curves and graphs to explain the causes, limitations, and effects of changes in the reactor core and NSSS systems.
1. Normal Plant Transients
 - (a) Xenon transients
 - (b) Step load changes, auto and manual
 2. Safety Analysis
 - (a) Review of minor accidents
 - (b) Review of major accidents
 3. Reactor Control
 - (a) Temperature and power coefficient curves.

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2.0 PROCEDURE (Continued)

(b) Differential and Integral Rod Worth Curves.

(c) Period vs. Reactivity Curves.

(d) Xenon, Samarium, Boron Curves

d. Fuel Handling and Core Parameters

1. Fuel Characteristics and Limitations

(a) Mechanical

(b) Reactivity Worth

(c) Fuel Brunup

(d) Thermal Hot Spots

(e) Decay Heat

(f) Control Rod Programming

2. Fuel Leak Detection

3. Fuel Storage Facilities

4. Fuel Handling

(a) Core Alterations

(b) Tools, Equipment, Interlocks

(c) Fuel Handling and Inspection Procedures and Limitations

5. Inadvertant Criticality

(a) Recognition

(b) Prevention

6. Inverse Count Rate Calculations

e. Administrative Procedures, Conditions, and Limitations

1. Technical Specifications

(a) Safety and Operating Limits

(b) Bases

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2.0 PROCEDURE (Continued)

2. Facility Operating License

(a) Design

(b) Operating Considerations and Limitations

3. Administrative Instructions - Vol. 1

(a) Procedure - formation and approval

(b) Temporary and Permanent Changes

4. Emergency Plan - Vol. 13

5. 10 CFR 50, 55

6. Fire Protection - Vol. 19

7. QA Manual - Vol. 11

f. Heat Transfer, Fluid Flow, Thermodynamics

1. Basic Properties of Fluid and Matter

2. Fluid Statics

3. Fluid Dynamics

4. Heat Transfer by Conduction, Convection, Radiation

5. Change of Phase - Boiling

6. Burnout and Flow Instability

7. Reactor Heat Transfer Limits

g. Mitigating Core Damage

1. Incore Instrumentation

2. Excore Nuclear Instrumentation

3. Vital Instrumentation

4. Primary Chemistry

5. Radiation Monitoring

6. Gas Generation

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2.0 PROCEDURE (Continued)

Throughout the On-Site Lecture Phase the candidate's progress will be evaluated through quizzes, written examinations, and/or oral examinations.

2.2 Phase 2 - On-the-Job Training

Candidates will spend at least three months on on-the-job training as an extra man on shift working with the Shift Foreman.

- a. The candidate will direct day-to-day operations under the direction of the Shift Foreman.
- b. The candidate will complete Attachment 1, "On-the-Job Training Check-Off" for Senior Reactor Operators.
- c. The candidate will complete Attachment (5), TI-200, Supervisor/Staff Monthly Record.

2.3 Phase 3 - Review and Evaluation

This phase consists of a minimum of 40 hours of review, a simulated NRC type exam and evaluation. This period is in addition to the exams of Phase I.

3.0 RESPONSIBILITY:

3.1 Operating Supervisor, Unit 2, will be responsible for:

- a. Selection of candidates and method(s) used. This responsibility will be shared with Manager-O&M.
- b. Scheduling of the on-the-job training period

3.2 Manager - Operations & Maintenance will be responsible for:

Selection of candidates and method(s) used. This responsibility will be shared with Operating Supervisor, Unit 2.

3.3 Training Supervisor will be responsible for:

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3.0 RESPONSIBILITY (Continued)

- a. The execution and overall conduct of the SRO Replacement Training Program.
- b. Timely initiation of requests to the NRC for hot license examinations.
- c. The proper maintenance of records pertaining to this training program.
 1. Copies of examinations administered and the answers provided by the candidates.
 2. Copies of lesson plans and instructional aids.
 3. Lecture attendance and grade sheets.
 4. On-the-Job Check-Off Sheet
 5. Supervisor/Staff Monthly Record

3.4 SRO candidates will be responsible for:

- a. Completion of the on-the-job checkoff
- b. Timely completion of Supervisor/Staff Monthly Record.

4.0 DOCUMENTATION

Attachment (1) to this instruction and Attachment (1), (2), (3), and (5) to TI-200 listed below will be utilized to complete the information necessary on license applications.

TI-203 - Attachment (1) On-the-Job Training Checkoff

TI-200 - Attachments (1) Lecture Attendance and Grade Sheet

(2) Periodic/Comprehensive Exam Evaluation and Grade Sheet

(3) Oral Examination Evaluation

(5) Supervisors/Staff Monthly Record

CAROLINA POWER & LIGHT COMPANY
H. B. ROBINSON STEAM ELECTRIC PLANT

ON-THE-JOB TRAINING CHECKOFF

NAME: _____

DATES: _____ TO _____

A. Shift Foreman's Logs

Demonstrate the ability to maintain all logs normally maintained by Shift Foreman and be able to discuss reasons for recording each entry.

B. Discuss the following in detail:

1. Waste Releases

Liquid

Gas

2. Radiation Work Permits

Special

Standing

3. Chemistry Log

4. Jumper Log

5. Minimum Equipment List
(S.O. #12)

6. Equipment Inoperable Record
(S.O. #11)

7. Operations Work Procedures
(S.O. #9)

8. Standing Orders

#1

#2

#3

#4

#5

#7

#8

Shift Foreman

Date

Shift Foreman

Date

ON-THE-JOB TRAINING CHECKOFF (Continued)
 Standing Orders (Continued)

Shift Foreman

Date

#9

#10

#13

9. Operating Notes

10. FSAR - Chapter 14

11. Fire Protection (Vol. 19)

12. Abnormal Procedures (Vol. 5)

13. Emergency Instructions (Vol. 6)

14. General Procedures (Vol. 4)

15. Emergency Plan (Vol. 13)

including notifications

16. Tech. Specs. (Including Reporting
Requirements)

17. Administrative Instructions (Vol. 1)

Section 4

Section 5

Section 11

Section 12

18. LER Forms

19. Shift Foreman's duties
(general)C. Noted and forwarded.

Operating Supervisor #2

Date

ROUTE TO TRAINING GROUP WHEN COMPLETED!