



H. B. ROBINSON
SEG PLANT

TITLE

TRAINING INSTRUCTION NO. 201

H. B. ROBINSON PLANT OPERATOR REPLACEMENT TRAINING PROGRAM

REV.	APPROVED BY	DATE	REV.	APPROVED BY	DATE	REV.	APPROVED BY	DATE
2	<i>W. Thayer</i>	2/8/79						
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Recommend By:

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1/25/79

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1.0 PURPOSE

The purpose of the H. B. Robinson Operator Replacement Training Program is to ensure that operator replacement personnel are provided with sufficient formal and on-the-job training to meet or exceed the requirements of ANSI Standard N18.1-1971, "Selection and Training of Nuclear Power Plant Personnel", and 10 CFR 55, "Operators' Licenses". It is intended that graduates of this program will be prepared to pass the NRC hot license examinations and to operate the H. B. Robinson Plant in a safe and efficient manner.

2.0 PROCEDURE

No single training program can account for the wide differences in training and experience that may be encountered in candidates selected for operator replacement training. Two general categories of replacement candidates are recognized as those having:

- a. Previous PWR power plant (including Navy Nuclear Power) operating experience, and
- b. Little or no previous nuclear experience.

The training program set forth in this instruction represents the minimum training for candidates in category "b", above. Candidates in category "a" may be exempted from portions of training, but only to the extent that such exemption is justified by previous nuclear experience. In addition, the scope and content of the various phases of training may be adjusted to fit individual needs, using the same guidelines.

Prior to participating in an NRC License Exam, each candidate will hold a high school diploma or equivalent and will have at least two years of power plant experience, at least one year of which is nuclear power

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2.0 PROCEDURE (Continued)

plant experience.

The Operator Replacement Training Program is divided into three phases:

(1) On-site lectures, (2) Reactor startup experience, and (3) On-the-job training. Following is a description 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 and Principles of Reactor Operation

1. Atomic and nuclear physics
2. Fission process
3. Neutron multiplication
4. Reactivity
5. Reactivity coefficients
6. Reactor control
7. Rod worth
8. Xenon, Samarium and control poison effects
9. Shutdown margin

b. Design Features

1. Nuclear Steam Supply System
 - a. Reactor vessel and internals
 - b. Fuel
 - c. CVCS

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2.0 PROCEDURE (Continued)

2. Steam, condensate, feedwater and related systems
3. Turbine - generator and supporting systems
4. Safety Systems
 - a. Safety Injection
 - b. RHR
 - c. Containment Spray
 - d. Diesel Generator Emergency Power
5. Electrical Distribution
 - a. 230 KV
 - b. 4160 V
 - c. 480 V
 - d. DC Distribution
- c. Operating Characteristics
 1. Reactor Control
 - a. Control Rod Manipulations
 - b. Xenon Transients and Oscillations
 - c. Step load changes, auto and manual
 2. Safety Analyses
 - a. Review of minor accidents
 - b. Review of major accidents
- d. Instrumentation and Control Systems
 1. Nuclear Instrumentation
 2. Reactor Manual Control

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2.0 PROCEDURE (Continued)

- 3. Rod Position Indication
- 4. Reactor Protection System
- 5. Containment Isolation
- 6. Steam Break Detection
- 7. SI Initiation and Control Logic
- e. Standard and Emergency Operating Procedures
 - 1. Precautions and Limitations
 - 2. Overall Plant Operating Procedures (GP-1)
 - 3. Emergency Immediate Actions
 - 4. Emergency Plan and Procedure
- f. Radiation Control and Protection
 - 1. Radiation and Contamination
 - 2. Biological effects
 - 3. Time/distance/shielding
 - 4. 10 CFR 20
 - 5. Monitoring Systems and Instruments
 - 6. Radiation Procedures
- g. Chemistry
 - 1. Chemistry Control and Limits
- h. Technical Specifications
 - 1. Organization and Format
 - 2. Safety Limits and Limiting Safety System Settings
 - 3. Discharge Limits
 - 4. Limiting Conditions for Operations
- i. Quality Assurance Responsibilities for Operations Personnel
- j. Heat Transfer, Fluid Flow, Thermodynamics

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2.0 PROCEDURE (Continued)

1. Basic properties of fluid and matter
2. Fluid statics
3. Fluid dynamics
4. Heat transfer for conduction, convection, radiation
5. Change of Phase - Boiling
6. Burnout and Flow Instability
7. Reactor Heat Transfer Limits

k. Mitigating Core Damage

1. Incore instrumentation
2. Excore Nuclear Instrumentation
3. Vital Instrumentation
4. Primary Chemistry
5. Radiation Monitoring
6. Gas Generation

2.2 Phase II: Reactor Startup Experience

Candidates will perform at least eight (8) reactor startups on a fully-instrumented reactor or reactor simulator. This training will provide the students with observations of nuclear instrumentation responses during sub-critical multiplication, approach to criticality, and supercritical operation.

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2.0 PROCEDURE (Continued)

2.3 Phase III: On-the-Job Training

During this phase, candidates will participate in a program of on-the-job training for 3 months on shift as an extra person in the control room which involves:

- a. Manipulation of the nuclear plant controls under instruction during day-to-day operations.
- b. Periodic test familiarization should be completed in accordance with TI-202.
- c. Experience in training startups and shutdowns of the reactor, and
- d. Counselling from licensed operating personnel to facilitate the candidate's understanding of overall plant performance, systems design and performance, and operating procedures.

Attachment 4, TI-201A, to be completed during this phase.

An appropriate reactor simulator may be used to augment this training. During Phase III the Shift Foremen to whom the candidates are assigned will oversee their training activities and will report their training to the Training Supervisor.

When it has been determined by the Operating Supervisor, Unit 2, that a candidate has received sufficient training and experience, and when Attachment (3) and (4) to Training Instruction, TI-201A, have been completed, he will be permitted to take the reactor operator hot license examination for the H. B. Robinson Plant.

Throughout the Operator Replacement Training Program, the candidates' progress will be evaluated through a combination of quizzes, written examinations and/or oral examinations.

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3.0 RESPONSIBILITY

3.1 Operating Supervisor, Unit 2

The selection of candidates and the method(s) used for the selection of candidates will be the responsibility of the Manager - Operations & Maintenance and Operating Supervisor, Unit 2.

3.2 Training Supervisor

The Training Supervisor will be responsible for:

- a. Prescribing the duration and content of training for each candidate.
- b. The execution and over-all conduct of the Operator Replacement Training Program.
- c. Timely initiation of requests to the NRC for hot license examinations.
- d. 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. Training reports from Shift Foremen.

3.3 Shift Foremen

Shift Foremen will be responsible for the supervision and reporting of training during Phase III for candidates assigned to their shifts.

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4.0 DOCUMENTATION

Attachments (1) through (4) to Training Instruction TI-201A, listed below will be utilized to compile the information necessary on license applications.

- Attachment (1) Lecture Attendance and Grade Sheet
- (2) Replacement Candidate Record
- (3) System Qualification Checkoff (master)
- (4) On-the-Job Training Checkoff

The Training Supervisor will complete Attachment (1). The Shift Foreman and/or Candidate will utilize Attachments (2), (3), and (4) to report training under Phase III.

The following documentation for the replacement training program will be retained in the training records for use in compiling and substantiating data for NRC hot license examination requests.

- (1) Attachments 1, 3, and 4 of TI-201A
- (2) Attachment 8 of TI-200