DUKE POWER COMPANY

OCONEE NUCLEAR STATION

OPERATOR LICENSING PROGRAM

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OCONEE NUCLEAR STATION
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1.0 INTRODUCTION

Operator license training is a requirement of 10 CFR 55. The Operator Licensing Program for Oconee Nuclear Station is designed to provide the trainee with the necessary knowledge and training to become a competent operator. This program will be conducted on a continuing basis as the needs for replacement training demand. This program will include the use of lectures, on-the-job training, simulator training and audit examinations. The program will be implemented so as to minimize scheduling difficulties that will be incurred by site management.

2.0 DEFINITIONS

Reactivity Change

An operator trainee that performs five reactivity changes from those listed below in accordance with Section 5.2, License Training Programs, (Subsection 5.2.1.d), meets the requirements of 10 CFR 55, Appendix B.

(a) Critical approach from subcritical on source range instrumentation to critical at the point of adding heat on the intermediate range instrumentation.

(b) Any power level change (increase or decrease) of 10 percent of rated power or greater with control rods in manual.

(c) Reactor shutdown from critical at 15 percent of rated power to subcritical, shutdown on source range instrumentation.

(d) Boration or deboration during critical operation.

(e) Operation of refueling bridge to change core geometry during refueling.

3.0 EDUCATIONAL REQUIREMENTS

The minimum educational requirements for operator license trainees will be in accordance with Section 4.5 of ANSI 3.1 - 1978.

4.0 SCOPE

The range of instruction provided for operator training includes complete training for personnel of various initial entry experience levels.

(a) Experienced personnel previously assigned to a nuclear or fossil station or military nuclear trained personnel.

(b) Technical school trained with cooperative education on-the-job training.

(c) Engineering graduates.

(d) Non-trained and non-experienced personnel.

The initial entry level which an employee is admitted into the operator training program shall be determined after a conservative evaluation of the employee's past experience and level of understanding.

5.0 TRAINING OPERATIONAL DESCRIPTION

Training and qualification of operators consists of classroom experience, on-the-job performance tasks, simulator training and audit evaluation. Formal training consists of live lectures, taped lectures, and self-study assignments.

5.1 ORIENTATION TRAINING

The screening of new employees is done at the station or General Office by means of pre-employment tests and interviews. Pre-employment tests are used as a selection measurement tool based on job success performance criteria for the selection of new employees. When a prospective employee is selected for employment and hired, he is given orientation training which introduces him to the Company, Company and Station policy, nuclear energy, health physics, safety, basic quality assurance policies and procedures and basic system configurations. Qualification requirements for restricted area access are met during orientation training. This phase of training encompasses 24 hours of live and taped lectures.

5.2 LICENSE TRAINING PROGRAMS

5.2.1 Reactor Operator License Training Program

A course consisting of:

(a) Lectures and quizzes covering:

TOPIC: 1 REACTOR THEORY (RT)

LESSONS:

Fission Process
Neutron Multiplication Factor
Subcritical Multiplication
Reactor Kinetics
Reactor Poisons

Main Steam System
Auxiliary Steam System
High and Low Pressure Extraction System
Condensate System
Feedwater System
Emergency Feedwater System
Steam Seal System
Condenser Vacuum System
Heater Vent and Drain System
Auxiliary Gas Systems
Generator Stator Cooling System
Hydrogen Seal Oil System
Turbine Lube Oil System
Auxiliary Service Water System
Instrument Air System
Breathing Air System
Continuous Vacuum Priming System

TOPIC: 4 COMPONENTS (CM)

LESSONS:

Once-Thru Steam Generator
Main Turbine
Generator and Alterex
Evaporators
Keowee Hydro Generator
Moisture Separator Reheater
Feedwater Pump Turbine
York Air Conditioner
Westinghouse Reactor Coolant Pumps
Bingham Reactor Coolant Pumps
Pressurizer
Core Design and Construction
Control Rod Designs
Auxiliary Shutdown Panels

TOPIC: 2 CORE PERFORMANCE (CP)

LESSONS:

Core Description
Power Distribution
Hot Channel Factors
Core Thermal and Hydraulic Description
Reactivity Coefficients
Reactivity Control

TOPIC: 3 SYSTEMS (SY)

LESSONS:

Reactor Coolant System
High Pressure Injection System
Low Pressure Injection System
Reactor Building Spray System
Reactor Building Cooling System
Reactor Building Purge System
Penetration Room Ventilation System
Core Flood System
Component Cooling System
Spent Fuel Cooling System
Spent Fuel Pool Filtered Exhaust System
Chemical Addition and Sampling
Coolant Storage System
Coolant Treatment System
Hydrogen Purge System
Once-Thru Steam Generator Wet Layup System
Low Pressure Service Water System
High Pressure Service Water System
Recirculating Cooling Water System
Condenser Circulating Water System

TOPIC: 5 INSTRUMENT AND CONTROL (IC)

LESSONS:

Nuclear Instrumentation
Incore Instrumentation
Reactor Coolant System
Control Rod Drive System
Integrated Control System
Electrohydraulic Turbine Control
Engineered Safeguards System
Reactor Protective System
Radiation Monitors (RIA)
Plant Transient Response
Fire Detection System

TOPIC: 6 ELECTRICAL (EL)

LESSONS:

Main Power Distribution
Vital Instrumentation and Control Power
DC Power Distribution
Emergency Power Distribution
Power Switching Logic

TOPIC: 7 FUEL HANDLING (FH)

LESSONS:

Fuel Handling System
Fuel Handling Bridges
Fuel Handling Auxiliaries

TOPIC: 8 RADIATION/RADIATION CONTROL (RC)

LESSON GUIDES:

Radiation Protection Text
System Health Physics Manual

TOPIC: 9 PROCEDURES (PR)

LESSON GUIDES:

Operating Procedures
Emergency Procedures
Alarm Responses

TOPIC: 10 CHEMISTRY (CH)

LESSONS:

Primary Chemistry
Secondary Chemistry
Radiolitic Chemistry

TOPIC: 11 ADMINISTRATIVE PROCEDURES AND CONTROLS (AD)

LESSON GUIDES:

Basic Procedures
Technical Specifications
Emergency Plan
Operating Experiences (Industry and Station)
Station Directives

TOPIC: 12 ENVIRONMENTAL (EN)

LESSONS:

- Radiological Impact of Releases
- Radiological Gaseous Releases
- Radiological Liquid Releases
- Radiological Solid Releases
- Non-Radiological

TOPIC: 13 FLUID FLOW, AND THERMODYNAMICS

LESSONS:

- Properties of Fluids and Matter
- Fluid Mechanics
- Thermodynamics

TOPIC: 14 RECOGNIZING & MITIGATING SEVERE CORE DAMAGE

LESSONS:

- Core Cooling Mechanics
- Potentially Damaging Operating Conditions
- Recognizing Core Damage
- Gas/Steam Binding
- Hydrogen Hazards
- Critical Parameters
- Radiation Hazards

NOTE: The above-described classroom lecture schedule is designed to meet the needs of all but the non-trained and non-experienced personnel. (Basic mathematics and basic nuclear physics subjects would be taught to those personnel as a prerequisite to entry into the program.) Equivalency for previous training and experience will be granted on a case-by-case basis to determine applicable sectors for bypassing.

(b) In-Plant Experience

The on-the-job training phase shall assure that the license trainee will meet or exceed the intent of the requirements of ANSI 3.1-1978, Section 4.5.1.

The program will include a minimum of three months training on shift as an extra person in the control room which will require the manipulation of nuclear power plant controls during day-to-day operation. This phase of training will include the performance of the Task Training Lists (TSR-2C). The operator trainee will complete the Basic II and Advanced IA and IB Tasks Lists during his in-plant training. These Task Training Lists are included as Enclosure 7.1, 7.2, and 7.3. Enclosure 7.5 is an implementing instruction describing the use of Task Training Lists.

(c) Reactivity Changes

The trainee during his on-the-job training phase will perform five reactivity changes as described in Section 2.0, Definitions, with no more than four being any combination of Items 2.b), 2.d), and 2.e). Reactivity changes will be documented in the training files.

(d) Simulator Training

All trainees will participate at a minimum in a one-week (40 hours) simulator training course, consisting of 20 hours classroom and 20 hours simulator, at an approved facility such as the B&W simulator, Lynchburg, Virginia and obtain certification attesting to this ability to:

(1) Manipulate the controls and keep the reactor under control during a reactor trip

(2) Predict instrument response and use the instrumentation during a reactor startup

(3) Follow the facility startup procedures

(4) Explain alarms and annunciators that may occur during this operation

NOTE: The above certification need not be obtained if the NRC licensing examination will include a reactor startup for the trainee during his operational portion of the NRC licensing examination.

(e) Review and Evaluation

Following the above portions of the training program, a period of a minimum of 40 hours will be utilized for review preparation for licensing examination and an audit examination with evaluation of trainees ability to successfully perform for a licensing examination. Examination and results of audit examination will be documented in the trainee's training file. If evaluation by the training staff and management determines a need for additional training prior to NRC licensing examination date, a reassignment for future license training will be made.

5.2.2 Senior Reactor Operator Training Program

(a) For a senior license candidate with a previous Reactor Operator License on this facility, the course of instruction will encompass review and an expanded depth in the areas of Section 5.2.1.

NOTE: Training will be approached from a supervisory aspect, with course length determined by experience and depth of knowledge of candidates.

(b) In-Plant Experience

The on-the-job training phase shall assure that the license trainee will meet or exceed the intent of the requirements of ANSI 3.1-1978, Section 4.5.1.

The program will include a minimum of two weeks training on shift as an extra person which will require the supervision of plant operations during day-to-day operation. This phase of training will include the performance of the Task Training List (TSR-2C). The Senior operator trainee will complete the Advanced III Tasks List during his in-plant training. This task list will be filed in the operator trainee's training file. This Task Training List is included as Enclosure 7.4 .

(c) Operational Experience

1. Applicants for Senior Operator Licenses shall have 4 years of responsible power plant experience consisting of that obtained as:

(a) Control Room Operator (Fossil or Nuclear)
(b) Power Plant Staff Engineer
(c) Reactor Operator (Research Reactor)
(d) Reactor Operator (U.S. Naval Nuclear Plant)
(e) Shutdown Maneuvering Watch (U.S. " ")
(f) Engineering Watch Supervisor (U.S. " ")
(g) Engineering Officer of Watch (U.S. " ")

NOTE: Items C thru G creditable for hours of actual watchstanding only.

A maximum of 2 years power plant experience may be fulfilled by Academic or related Technical Training on a one-for-one time basis. (NOTE: Naval Nuclear Power School creditable for 6 months and Naval Nuclear Power Training Unit [Prototype] creditable for 6 months; Duke Power Company Basic Nuclear Academic Training including Research Reactor Training creditable for 12 months; all other training programs not herein described will be creditable on a case basis.)

Two years shall be Nuclear Power Plant Experience. At least 6 months of the Nuclear Power Plant Experience shall be at this plant.

Candidates for Senior Operator Licenses shall have held an Operator's License for a minimum of 1 year at time of application to NRC for examination. (NOTE: Applicable after December 1, 1980.)

(d) Simulator Training

All trainees will participate at a minimum in a one-week (40 hours) simulator course, consisting of 20 hours classroom and 20 hours simulator, at an approved facility such as the B&W simulator, Lynchburg, Virginia.

(e) Review and Evaluation

Following the above portions of the training program, a period of a minimum of 40 hours will be utilized for review preparation for licensing examination and an audit examination with evaluation of trainees ability to successfully perform for a licensing examination. Evaluation and results of audit examination will be documented in the trainee's training file. If evaluation by the training staff and management determines a need for additional training prior to NRC licensing examination of a degree inconsistent with remaining time to examination date, a reassignment for future license training will be made.

6.0 RECORDS

6.1 Training records for each trainee will be maintained and shall contain the following:

(a) Examination results - Unsatisfactory will include specifics
(b) On-the-job training documentation
(c) Records of reactivity changes
(d) Evaluations made by training staff*
(e) Evaluations made by simulator staff*
(f) Startup certification
(g) Documentation of training participation

* Where Applicable

6.2 Training records will be retained for a minimum of six years.

7.0 ENCLOSURES

7.1 Task Training Data (TSR-2C) B-II

7.2 Task Training Data (TSR-2C) A-IA

7.3 Task Training Data (TSR-2C) A-IB

7.4 Task Training Data (TSR-2C) A-III

7.5 Implementing Instructions for TSR-2C Usage

Enclosure 7.5

Subject: Task Training
Plant Operations
Guidance & Definitions

The following information concerns Task Training as it relates to the plant Operations Group and supplements the material contained in the Nuclear Station Training Plan.

1. Completeness - It should be emphasized that a concerted effort should be made towards completing a task list in a timely manner. Tasks were selected based on three criteria - relevance to the present work classification, preparation for the next training module and to meet NRC operator licensing requirements. Tasks that could have a significant impact on the individual's performance in the next training module carry a single asterisk (*) and tasks that are required, carry a double asterisk (**).

2. Timeliness - The Basic II task list should be completed prior to starting the Advanced I task lists which are a part of the Licensed Preparatory module. The Advanced I task lists should be completed before starting the classroom or simulator phase of the License Preparatory (RO) module.

3. Criteria and Standards - The actual performance level is at the discretion of the individual directing the task or the trainee's shift supervisor.

   It is recognized that a trainee may not be able to perform a task because of plant conditions or he may be given credit by virtue of previous work experience related to that task. However, as a minimum, the individual should be capable of simulating a performance of a task. The intent of a performance criteria is to provide reasonable assurance that the trainee will be able to perform a task should he be called on to do so in the future.

   The designated Signature column of the task list is for use by the Operations Group to document that a task was performed satisfactorily. It is suggested

that the trainee perform Task "0" first. The designated signature for this task should be a shift supervisor. At this time, the shift supervisor would notify the trainee as to the designated signatures required for the remaining tasks.

The standards used to evaluate the satisfactorily performance of a task are determined by the designated individual. It is suggested that after the date indicating when the task was performed satisfactorily, that it should be noted whether the task was performed (P) or simulated (S). Because of plant conditions, a task or evolution within a task may not be able to be performed. These notations could then be used to identify those trainees, who initially simulated the performance of a task and now may be able to actually perform the task because of a change in plant conditions. Required tasks, those carrying a double asterisk (**), must be performed.

4. Distribution - The operations instructor who is responsible for the relevant training area will issue the appropriate task lists. The completed task lists shold be returned to the issuing instructor.

5. Documentation - The responsible instructor will transmit the completed task lists to the group responsible for training record entries.