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**Edwin I. Hatch Nuclear Plant**



**Georgia Power**

*the southern electric system*

August 12, 1980  
PM-80-816

PLANT E.I. HATCH

Ref: Criteria for Reactor Operator Training

Mr. Paul F. Collins  
Chief, Operator Licensing Branch  
U.S. Nuclear Regulatory Commission  
Room 330  
Washington, D.C. 20555

Gentlemen:

The enclosed information is provided to you in response to Enclosure 1 of "Criteria for Reactor Operator Training and Licensing" dated March 29, 1980. This information is an excerpt from the new training outline to be used for future license candidates for Plant E.I. Hatch. We feel that this outline will meet requirements of step A.2.c. of Enclosure 1.

In reference to step A.2.e, concerning requalification programs for instructors, it is felt that our current policy of requiring instructors to maintain active licenses should be adequate to meet this requirement. In order to maintain an active license, the instructors are required to attend annual simulator training and retraining lectures as required by our Plant Hatch Requalification Program initially approved by the Operator Licensing Branch.

If additional information on these two programs is required, please call at 912-367-7781.

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Plant Manager

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Training File

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I. PHASE 1 - BASIC LICENSE PREPARATION

2 months

A. MATHEMATICS

Fractions

Negative Numbers

Use of letters to Represents Numbers

Solution of Algebraic Equations

Computations with Units and Dimensions

Exponents

Powers of Ten

Exponential Process

Base e

Natural Logarithms

Common Logarithms

B. CLASSICAL PHYSICS

Definition of Physics

Scientific Method

Units of Measurements

Combining Fundamental Units

Unit Conversion

Linear Motion

Gravitational Forces

Force of Friction

Linear Momentum

Rotational Motion

Angular Momentum

Work

Energy

Power

Negative and Positive Charges

Coulomb's Law  
Electric Fields  
Electric Potential  
Potential Difference  
The Electron Volt  
Wave Propagation  
Electromagnetic Waves  
Origin of the Quantum Theory

C. Chemistry

Chemical Terms  
Laws of Chemical Reaction  
Dalton's Hypothesis  
Atomic Weight  
Electrons, Valence, and Periodic Chart  
Physical and Chemical Description of the Elements  
Nuclear Notation for Identifying Atoms  
Kinetic Theory of Gases  
Gram Molecular Weight and Avogadro's Number  
Atomic Concentration  
Weights and Sizes of Atoms and Molecules  
Discovering the Atom  
Quantum Mechanics  
Use of Atomic Quantum Numbers  
Periodic Table of the Elements  
X-rays

D. THERMODYNAMICS

Energy Transfer Systems  
Properties of Working Fluids  
Forms of Energy  
Work and Heat  
Energy and Power Equivalences  
Enthalpy  
The First Law of Thermodynamics  
Applied General Energy Equation

Second Law of Thermodynamics  
Phases of Matter  
Phase Diagrams  
Steam Tables  
Use of Saturated Steam Tables  
Use of Superheated Steam Tables  
Liquid Heat Capacity  
Mollier Diagram  
Types of Power Cycles  
Power Cycle Refinements  
Elements of Power Cycles  
Power Cycle Efficiency  
Overall Plant Efficiency  
Sample Analysis of a Nuclear Power Plant

E. FLUID MECHANICS

Basic Fluid Flow Relationships  
Units of Fluid Flow  
Laminar and Turbulent Flow  
Continuity of Flow  
Bernoulli's Equation  
Fluid Friction  
Evaluating Head Loss from Friction  
Evaluating Head Added by Pumps  
Measuring Fluid Flow Rate  
Two Phase Fluid Flow

F. HEAT TRANSFER

Modes of Heat Transfer  
Fundamentals of Heat Transfer  
Conduction  
Convection  
Boiling Heat Transfer  
Combined Heat Transfer  
Heat Exchanger Heat Transfer

NUCLEAR POWER PLANT COMPONENTS (cont'd.)

Moisture Separators

Generators

IV. PHASE 4 - REACTOR TECHNOLOGY

10 weeks

A. PLANT HATCH SYSTEMS

Reactor Vessel Assembly

Fuel

Control Rod Drive Mechanism

Control Rod Drive Hydraulics

Reactor Manual Control

Recirculation System

Recirculation Flow Control

Main Steam

EHC System

Reactor Vessel Instrumentation

Feedwater Control

Primary & Secondary Containment

Reactor Bldg. Closed Cooling Water System

Reactor Water Cleanup

Process Radiation Monitors

Area Radiation Monitors

Source Range Monitors

Intermediate Range Monitors

Local Power Range Monitors

Average Power Range Monitors

Gaseous Radwaste

Solid & Liquid Radwaste

Rod Block Monitoring

Reactor Protection System

Traversing Incore Probe

Auto Depressurization System

High Pressure Coolant Injection

Core Spray

Jockey Pump System

PLANT HATCH SYSTEMS cont'd

RHR System

Reactor Core Isolation Cooling

Standby Liquid Control System

Fuel Pool Cooling

Rod Worth Minimizer

Rod Sequence Control System

B. TECHNICAL SPECIFICATIONS

LIMITS

LCO'S

BASES FOR LCO'S

C. PROCEDURES

ADMINISTRATIVE

NORMAL OPERATION

ABNORMAL

EMERGENCY

D. ACCIDENT AND TRANSIENT ANALYSIS

PLANT SAFETY CRITERIA

INHERENT REACTOR PROTECTIVE FEATURES

PLANT PROTECTION SYSTEMS

ENGINEERED SAFETY SYSTEMS

ACCIDENT ANALYSIS

REACTOR SAFETY EXPERIENCE

PLANT RESPONSE

E. SEVERE CORE DAMAGE ACCIDENT

1. Vulnerable Operating Conditions

(a) Offsite Power Losses

(b) Onsite Power Losses

(c) Inoperative Plant Equipment

2. Core Cooling Mechanics

(a) Flow Paths (normal)

(b) Alternate Cool Methods

(c) Cooling Mode Selection

3. CORE DAMAGE

- (a) Detection
- (b) Verification Methods
- (c) Damage Assessment

4. CORE GASES

- (a) Sources
- (b) Effects on Cooling
- (c) Elimination and/or control of gases
- (d) Hydrogen hazards

5. CRITICAL INSTRUMENTATION DURING ACCIDENT

- (a) Pressure
- (b) Temperature
- (c) Level
- (d) Radiation
- (e) Alternate methods of evaluation

6. RADIATION HAZARDS

- (a) Location
- (b) Monitoring Instrument Response
- (c) Radiological Emergency Plan

F. PLANT FAMILIARIZATION

EQUIPMENT LOCATION

VALVES

LINE PATHS

ELECTRICAL SUPPLIES

IDENTIFICATIONS