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SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT □ 6201 S Street, P.O. Box 15830, Sacramento CA 95852-1830, (916) 452-3211
AN ELECTRIC SYSTEM SERVING THE HEART OF CALIFORNIA

RJR 85-386

August 8, 1985

DIRECTOR OF NUCLEAR REACTOR REGULATION
ATTN JOHN F STOLZ CHIEF
OPERATING REACTORS BRANCH #4
U S NUCLEAR REGULATORY COMMISSION
WASHINGTON DC 20555

RANCHO SECO NUCLEAR GENERATING STATION REQUEST FOR ADDITIONAL INFORMATION ON TOPICAL REPORTS T1-80 AND T2-80

Your letter of June 7, 1985 requested additional information regarding Topical Reports T1-80, "Operator Training Program for NRC Hot License Candidates," Revision 1 and T2-80, "NRC Licensed Operator Retraining Program," Revision 1. The items you requested additional information on and the SMUD responses are listed below.

NRC Item No. 1:

Item 5.4 (p. 4) Evaluation and observation allows for the advanced placement and/or exemption of trainees into portions of the training program. We request that you modify your program so that examinations verifying the present knowledge of the individual is comparable to the knowledge of an individual completing the training segment are required prior to excusing this individual from the training as suggested in Section 5.2.1.7, Testing in Lieu of Training, in ANSI/ANS-3.1-1981.

Please explain Training Division Procedures (TDPs) and how they pertain in trainee evaluation for advanced placement/exemption into training programs.

SMUD Response to Item No. 1:

Rancho Seco's Training Division Procedures (TDPs) define and clarify the concise procedures that govern the operation, development and administration of training and training programs. The procedures relate to such areas as the development and evaluation of staff, evaluation and revision of training programs, recordkeeping, division organization, etc. A complete uncontrolled set of TDPs is enclosed for your information. The purpose of the TDPs is to establish and ensure practices which will result in quality instructional programs for plant personnel as required by INPO accreditation criteria. The TDPs are reviewed on a regular basis to ensure they are effective and that they accurately reflect actual practices.

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NRC Item No. 2:

Discuss the certifications completed pursuant to Sections 55.10(a)(6) and 55.33(a)(4) and (5) of 10 CFR Part 55. Provide the title of the individual who will certify the eligibility of individuals for licensing or renewal of license. (Ref. Enclosure 1 of H. R. Denton's March 28, 1980 letter to all power reactor applicants, Section A.3).

SMUD Response to Item No. 2:

The title of the individual who will certify the eligibility of individuals for licensing or renewal of license is: Assistant General Manager, Nuclear.

The Simulator Start-Up Certification is a Power Safety International Program designed to certify to the NRC that the license candidate has safely conducted a reactor start-up under examination conditions.

The Start-Up Certification Program Consists Of:

° Classroom session - designed to review for each candidate the area of:

- Nuclear Instrumentation
- Control Rod Drive Operations
- Reactivity Balances
- Reactor Theory Review
- Heat Transfer and Thermodynamics Review
- Pressurizer and Steam Generator Operations
- Start-Up Operating Procedures

° Simulator Operation Session:

- Reactor Start-Up With All Rods In
- Reactor Start-Up With Safety Rods Out
- Moderator Temperature Coefficient Demonstration
- Reactor Start-Up to ≥5% Power
- Plotting Heat-Up Rates
- Start-Up Certification Examination

° Start-Up Certification Examination:

During the Start-Up Certification examination, the candidate will:

- Recognize and announce when Keff ≥ 1.0
- Recognize and announce when overlap requirements have been satisfied for nuclear instruments and control rod drives
- Increase power to below point of heat addition using predetermined start-up rates
- Establish critical conditions for plant
- Identify and announce point of adding heat
- Heat-up to 5% power at a predetermined SUR
- Identify and announce when reactor is at 5% power using proper indication

NRC Form-398, "Personal Qualifications Statement-License," further details applicants' education, training, and experiences that ensure compliance with NRC-approved training programs. This form is signed by the Assistant General Manager, Nuclear, certifying eligibility of the individuals for licensing or renewal of license.

NRC Item No. 3:

The simulator training program does not include all core manipulations which are described in H. R. Denton's March 28, 1980 letter, Enclosure 4. While these manipulations pertain to the requalification program, it is requested that you modify your programs for operators and senior operators to include all manipulations to ensure they are introduced in the initial training.

SMUD Response to Item No. 3:

The simulator training program identified a typical list of simulator exercises for operators and senior operators. Operator and senior operator programs have been modified to comply with your request to include all manipulations, with the exception of (8) and (12), for reasons addressed in Item 4, to ensure they are introduced in the initial training.

NRC Item No. 4:

Our review of the control manipulations in the Enclosure of your retraining program and the list of manipulations in Enclosure 4 of the H. R. Denton letter of March 28, 1980, in NUREG-0737, indicates that the following exercises are not included:

(8) Loss of instrument air (if simulated plant specific).

(12) Loss of service water (if required for safety).

Please modify your program accordingly or explain why these exercises were omitted from your Enclosure.

SMUD Response to Item No. 4:

The two items: (8), "Loss of Instrument Air" (if simulated plant specific) and (12), "Loss of Service Water" (if required for safety) are not included in the list of manipulations, because:

° Rancho Seco does not have a plant specific simulator. Loss of Instrument Air will be included as a required control manipulation when Rancho Seco operates its own plant specific simulator.

° Loss of Service Water has no safety impact; therefore, it is not included in the list of manipulations.

However, the "Loss of Instrument Air Casualty" will be included as part of the annual oral examinations.

NRC Item No. 5:

Item (3) of the control manipulations, "Manual control of steam generators and/or feedwater during startup and shutdown" has been included, however, it is not indicated that this will be performed on an annual basis as described in Enclosure 4 of the H. R. Denton letter of March 28, 1980, in NUREG-0737. Please modify your program, or explain why this exercise will not be performed on an annual basis.

SMUD Response to Item No. 5:

Item (3) of the control manipulations, "Manual control of steam generators and/or feedwater during start-up and shutdown," has been indicated to be performed on an annual basis. (The omission of the asterisk (*) was a typing error; this has been corrected.)

NRC Item No. 6:

The criteria for accelerated training in Section 4 of your program on page 6 meets neither the intent of the Commission's position nor current industry standards. Accelerated training should be provided on a timely basis in the area(s) where licensed personnel exhibit deficiencies. We therefore request you modify your program to state that licensed personnel will be suspended from licensed duties when:

A) Overall grade on the annual written examination is less than 80% overall or less than 70% in a category.

B) Annual oral examinations or evaluations made by supervisors and/or training staff members of the performance and competency of licensed personnel during actual or simulated abnormal and emergency conditions clearly indicates the need for accelerated training.

Waiver of suspension from licensed duties will be considered if the Station Superintendent develops an Operation and Training Review Board that comprises members of the Station senior staff members. The Board should review the licensed individual's past performance, evaluate deficiencies and recommended training program before waiving suspension of licensed duties. The evaluation shall be completed within seven working days of the original findings. Accelerated training and reexamination must be completed within 30 days of the Board's recommendations.

SMUD Response to Item No. 6:

Section 4 of the retraining program has been modified to comply with your request that licensed personnel will be excluded from license duties when either of the following conditions exist:

A) Overall grade on the annual written examination is less than 80% overall or less than 70% in a category.

B) Annual oral examinations or evaluations made by supervisors and/or training staff members of the performance and competency of licensed personnel during actual or simulated abnormal and emergency conditions clearly indicates the need for accelerated training.

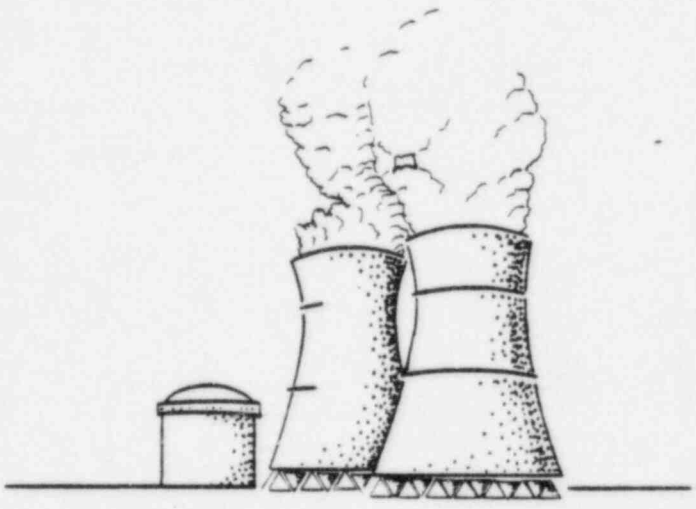
Waiver of suspension from licensed duties will be considered by the Plant Superintendent, who will develop an Operation and Training Review Board, consisting of the Operations Superintendent and the Training Superintendent. The Board shall review the licensed individual's past performance and evaluate deficiencies and recommended training program before waiving suspension of licensed duties. The evaluation shall be completed within seven working days of the original findings. Accelerated training and reexaminations must be completed within 30 days of the Board's recommendations.

Topical Reports T1-80 and T2-80 are enclosed for your review.

If you have any additional questions, please contact Mr. Ron Colombo at the Rancho Seco Nuclear Generating Station Unit No. 1.

R. J. RODRIGUEZ
ASSISTANT GENERAL MANAGER,
NUCLEAR

Enclosures - 3



RANCHO SECO

NUCLEAR GENERATING STATION

UNIT ONE

HERALD, CALIFORNIA

TOPICAL REPORT T1-80

operator training program for nrc hot license candidates

REV 1

SMUD

SACRAMENTO MUNICIPAL UTILITY DISTRICT

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TOPICAL REPORT T1-80

REV 1

SACRAMENTO MUNICIPAL UTILITY DISTRICT

RANCHO SECO

NUCLEAR GENERATING STATION

OPERATOR TRAINING PROGRAM

FOR

NRC HOT LICENSE CANDIDATES

LICENSED OPERATOR

1.0 PURPOSE

The purpose of this report is to formally establish the responsibilities of the NRC Licensed Operator and Senior Operator Training Plan at the Rancho Seco Nuclear Generating, Unit 1. The plan and contents established by this report shall be enforced and adhered to for the life of the plant.

The plan is established to meet the requirements of NUREG 1021 Section ES-109, "Eligibility Requirements for Reactor Operator and Senior Reactor Operator License Candidate."

This training plan is subject to approval by the Nuclear Regulatory Commission.

2.0 REFERENCES

.1 ANSI/ANS 3.1 1978, Selection and Training of Nuclear Power Personnel

.2 10 CFR 50, Licensing of Power Production and Utilization Facilities

.3 10 CFR 55, Operator Licenses

.4 NUREG 1021, Operator Licensing Examiner Standards

.5 INPO 83-022, PWR Control Room Operator, Senior Control Room Operator, and Shift Supervisor Qualification Guidelines

3.0 DEFINITIONS

The following terms are defined for uniform interpretation of this document:

.1 Controls -- When used with respect to a nuclear reactor, means apparatus and mechanisms; the manipulation of which directly affect the reactivity or power level of the reactor.

.2 Drill -- A supervised training exercise or walk-through conducted or simulated in a work environment for the purpose of developing and maintaining skills required to cope with plant abnormal/emergency conditions and including an evaluation of performance.

.3 Examination -- A test used to measure knowledge, skills, or achievement in one or more subjects.

DEFINITIONS (Continued)

3.4 Facility -- Means any production facility or utilization facility as defined per 10 CFR 50.2. Namely, "Utilization Facility" which means any nuclear reactor other than one designed or used primarily for the formation of plutonium.

.5 Instructional Hour or Contact Hour -- A one-hour period of training in which course instructor (the appropriate supervisor in on-the-job training phase) is present or readily available for instructing or assisting the trainee. One hour devoted to any of the following activities is considered an instructional hour under this definition.

* Programmed Learning
* Supervised Study
* Lectures
* Discussions
* Problem Solving Sessions
* Quizzes
* Examinations
* On-The-Job Training
* Laboratory Exercises
* Simulator Training and Exercises

.6 Observation Training -- Structured, on-the-job training in duties of operations personnel at an operational nuclear power plant.

.7 On-The-Job Training -- Training conducted through participating in nuclear power plant startup, operation, maintenance, or technical services under direction of experienced personnel. This training should include the systemic use of performance-based objectives, course schedules, tasks to be mastered, and task performance evaluations.

.8 Quiz -- A relatively short test used to measure achievement on material taught recently or on any small, newly completed unit of study.

.9 Operator -- An individual who manipulates controls of a facility. An individual is deemed to manipulate a control if he/she directs another to manipulate a control.

.10 Senior Operator -- An individual designated by a facility licensee under 10 CFR 50 to direct the licensed activities of licensed operators.

.11 Simulator -- A working model of the Control Room similar to the plant for which an individual is licensed or is a candidate for license. May considered a "simulator" provided it reproduces the general operating characteristics of the plant with similar arrangements of instrumentation and controls.

DEFINITIONS (Continued)

3.12 Simulate -- When an individual performs a walk-through of actions to be taken, using the control panel involved, discussing each step without actually operating any controls, he has "simulated" the operation. This method is used as a means of teaching or reviewing actions required by an emergency or abnormal condition.

4.0 STRUCTURE OF PLAN

The NRC Licensed Operator Plan is divided into the following programs:

* Reactor Operator
* Senior Reactor Operator

.1 The Reactor Operator Training Program is designed to prepare the trainee for the safe and efficient operation of the plant and for NRC licensing meeting the INPO Accreditation Training Program requirements. The Reactor Operator Training Program is delineated in Appendix A.

.2 The Senior Reactor Training Program is designed to prepare the trainee to become a Licensed Senior Reactor Operator and is delineated in Appendix B.

5.0 STRUCTURE OF PROGRAMS

The Rancho Seco Licensed Operator, Senior Operator Programs are divided into three basic phases. They are the "Classroom" phase, the "Self-Study" phase, and the "Job Training" phase. The components of each phase with a brief description is described in the applicable appendixes. The major portions of the programs are:

.1 Classroom Phase

The Classroom phase consists of preplanned lectures that meet the objectives of the course. Lectures may consist of preplanned supervised classroom discussions or seminars. Films, video tapes, programmed instruction and other effective training aids may be used to supplement lectures; however, an instructor shall be present to answer questions, lead discussions, and monitor class performance. The components of the classroom phase are delineated in the applicable appendices.

5.2 Self-Study Phase

The Self-Study phase consists of a structured module designed to allow the students to gain an indepth knowledge of the plant systems, the procedures associated with the systems, and to apply the theoretical concepts presented during the classroom phase to actual plant operations. Each candidate is issued a book consisting of study guide, list of reference materials, and checksheets to be completed to supplement the classroom phase. The checksheets are required to be completed prior to the NRC examination. The components of the self-study phase are delineated in the applicable appendices.

.3 Job Training Phase

The Job Training phase consists of modules designed to help the trainee develop an understanding and increase the candidate's awareness and experience in Control Room activities. The on-the-job module consists of checksheets to document tasks performed, simulated, or walked-through. The components of the job training phase are delineated in the applicable appendices.

.4 Evaluation and Observation

Evaluation and observation of trainees will be conducted and used to:

* Assure consistent progress throughout the program.
* Identify strengths and weaknesses.
* Allow for advanced placement and/or exemption of trainees into portions of the training program.

Trainee evaluation of performance shall be measured against established criteria. Evaluation techniques include:

* Written examinations and quizzes,
* Oral checkouts
* Operational demonstrations/simulations

Trainee evaluation for advanced placement/exemption into training programs shall be conducted in accordance with Training Division Procedures (TDPs).

.5 Records and Documentation

Training files shall be maintained in a format that is auditable to verify that training is conducted in accordance with the training programs. Records and documentation shall be in accordance with Administrative Procedures.

STRUCTURE OF PROGRAMS (Continued)

5.6 Instructors

.1 Instructors who teach safety systems, integrated responses, transients, and simulator courses shall demonstrate their competence to NRC by successful completion of a Senior Operator Examination.

For instructors who have appropriate experience/expertise in the above areas, but do not meet the requirements, a competent instructor will be in attendance during the class.

.2 Instructors shall be enrolled in appropriate requalification programs to assure they are cognizant of current operating history, problems, and changes to procedures and administrative limitations.

6.0 ENCLOSURES

.1 Appendix A, Operator Training Program

.1 A.1, Classroom Phase

.2 A.2, Self-Study Phase

.3 A.3, Job Training Phase

.4 A.4, Pre-License Audits

.2 Appendix B, Senior Operator Training Program

.1 B.1, Classroom Phase

.2 B.2, Self-Study Phase

.3 B.3, Job Training Phase

.4 B.4, Pre-License Audits

APPENDIX A

REACTOR OPERATOR PROGRAM

The Reactor Operator Training Program is designed to prepare the trainee for the safe and efficient operation of the plant and for NRC licensing meeting the INPO criteria for accreditation of training programs. The Reactor Operator Training Program is divided into three (3) basic phases. They are the "Classroom" phase, the "Self-Study" phase, and the "Job Training" phase. The components of each phase, with a description are:

A.1 Classroom Phase

The Classroom phase of the Reactor Operator Training Program consists of formal classroom presentation of academic subjects and nuclear power plant related technologies. Topics include mathematics, physics, systems and procedures, and other plant related topics. Courses in the classroom phase of the Reactor Operator Training Program are:

	Course	Contact Hours/Duration
.1	Mathematics	Approx 2 Weeks

The Mathematics course presents instruction on the essentials of mathematics. It includes indepth study of arithmetic, algebra, geometry, trigonometry, and introduction to calculus. The purpose is to provide the trainee with the necessary background to use mathematical concepts to understand and use technical information encountered in future course work and on the job.

.2	Classical Physics	Approx 1 Week

The Classical Physics course presents instruction on the fundamentals of classical physics in the areas of unit analysis, mechanics, energy and power, and electrostatics. The purpose is to provide the trainee with a better understanding of the physical process underlying the operation of plant systems and equipment.

.3	Reactor Theory	Approx 2 Weeks

The Reactor Theory course presents instruction on the theoretical bases of reactor operation. It includes indepth study of atomic structure, the fission process, reactor controls, and coefficients. The purpose is to provide the trainee with a theoretical understanding of the dynamics of reactor operation and control.

	Course	Contact Hours/Duration
A.1 .4	Heat Transfer and Fluid Flow	Approx 2 Weeks

The Heat Transfer and Fluid Flow course presents instruction on the mechanical action of heat and fluid behavior. It includes indepth study on thermodynamics, heat transfer applications, fluid statics, and fluid flow and applications. The purpose is to provide the trainee with a theoretical understanding of thermodynamics, heat transfer and fluid flow concepts, and their application to plant operations.

.5	Chemistry	Approx 8 Hours

The Chemistry course presents instruction on the theoretical bases and application of plant chemistry control. It includes a study of corrosion, water chemistry control, radiochemistry, and plant chemistry requirements. The purpose is to provide the trainee with an understanding of the importance and methods of chemistry control.

.6	Radiological Protection	Approx 16 Hours

The Radiological Protection course presents instruction on the theoretical bases and practical applications of health physics. It includes indepth study in the areas of radiation and its effects, radiation detection and monitoring devices, radiological controls, and the ALARA Program. The purpose is to provide the trainee with a sound understanding of the processes and methods of controlling personnel exposure.

.7	Electrical Theory	Approx 24 Hours

The Electrical Theory course presents instruction on the fundamentals of electrical equipment operation. The purpose is to provide the trainee with an understanding of the basic processes underlying the operation of plant electrical equipment and to read and interpret electrical diagrams used in the Control Room.

.8	Material Science	Approx 24 Hours

The Material Science course presents instruction on nuclear plant materials. In includes an indepth study of various material properties, mechanisms that affect these properties, and the characteristics of materials that are of interest to nuclear power plants. The purpose is to provide the trainee with a sound understanding of the nature of materials as it applies to plant design criteria and material limitations.

	Course	Contact Hours/Duration
A.1 .9	Systems Training	Approx 10 Weeks

The Systems Training course presents instruction in the design, construction, and operation of plant systems relevant to the licensed operator job functions. It includes indepth study on system flowpaths, components instrumentation, control functions, technical specifications, system interrelationships, and operation. The purpose is to provide the trainee with the understanding necessary to operate the systems from the Control Room. The list of systems may include, but are not limited to:

* Nuclear Fuel and Control Components
* Main Generator
* Once Through Steam Generator
* Reactor Vessels and Internals
* Reactor Coolant
* Reactor Coolant Pumps
* Reactor Building Spray
* Decay Heat Removal
* Spent Fuel Pool Cooling
* Component Cooling Water
* Safety Features Actuation
* Site Communications
* Main Steam
* Circulating Water
* Plant Cooling Water
* Turbine Lube Oil
* High Pressure Control Oil
* Nuclear Service Raw Water
* Turbine Electro-Hydraulic Control
* Hydrogen Seal Oil
* Hydrogen Gas
* Auxiliary Steam
* Nitrogen Gas
* Plant Air
* Makeup and Purification
* Control Rod Drive Cooling Water
* Pressurizer and Pressure Relief
* Lighting Distribution
* Main Turbine
* Containment Purge and Ventilation
* Emergency Core Cooling
* Chemical Addition and Sampling
* Radwaste -- Solid, Liquid, and Gaseous
* Feed and Condensate
* Auxiliary Feedwater
* Nuclear Instrumentation -- Nuclear and Incore

Course	Contact Hours/Duration

A.1 .9 Systems Training (Continued)

* Control Rod Drive
* Fire Protection
* Radiation Monitoring
* Emergency Diesel
* Electrical Distribution

.10 Procedures — Approx 2 Weeks

The Procedures course presents instruction on the procedures, policies, and practices related to overall plant operations during normal and off-normal conditions and administrative requirements affecting the Control Room Operator. The purpose is to provide the trainee with a sound understanding of the duties, responsibilities, and requirements placed on the Control Room Operator by the station operating and administrative procedures. The list of procedures may include, but are not limited to:

* Plant Heatup and Startup
* Normal Operation
* Plant Shutdown and Cooldown
* Reactivity and Heat Balance
* Boron Concentration Control
* Casualty Procedures
  - ... Loss of Vacuum
  - ... Los of Air
  - ... Loss of NNI
  - ... Inadequate Core Cooling
  - ... Loss of Subcooled Natural Circulation
* Administrative Procedures
  - ... Responsibilities and Authorities
  - ... Review, Approval, and Maintenance of Procedures
  - ... Work Requests
  - ... Clearance
  - ... Control Room Watchstanding
  - ... Post Trip Transient Report
* Emergency Plan
  - ... Applicable Procedures AP.500 - 599

.11 Refueling — Approx 16 Hours

The Refueling course presents instruction on the components, systems, precautions, and procedures associated with the core refueling and the handling of new and spent fuel. The purpose is to provide the trainee with a sound understanding of the fuel and control components handling methods and equipment necessary for safe and effective refueling operations.

	Course	Contact Hours/Duration
A.1 .12	Accident and Transient Prevention, Mitigation and Response	Approx 1 Week

The Accident and Transient Prevention, Mitigation and Response course presents instruction in the prevention of and responses to transient situations and mitigation of reactor core damage. It includes indepth study of preventing undesired transients and accidents, diagnosing plant conditions, basic reactor protection analysis, and mitigating core damage. The purpose is to provide the trainee with background to recognize and respond to abnormal or emergency conditions during plant operations.

.13 Process Instrumentation — Approx 16 Hours

The Process Instrumentation course presents instruction on the fundamentals of process variables measurement. It includes a study of temperature, pressure, flow, level, and position indication. The purpose is to provide the trainee with a basic understanding of the construction and operation of various process instruments.

.14 Pre-Simulator Review — Approx 1 Week

Approximately one week of Pre-Simulator Review training is scheduled prior to the simulator operation training. This is to brief the students about the simulator capabilities and reviewing major systems, procedures, and reactor control and operation. The material will also cover weak areas identified by past performances and will contain topics related to the particular simulator segments which will aid the trainee in obtaining maximum benefit from the simulator operations. The list of topics in this review course may include, but is not limited to:

* Reactor Theory
* Nuclear Instrumentation
* Major Non-Nuclear Instrumentation
* Integrated Control Systems
* Control Rod Drive Systems
* Normal, ABnormal, and Emergency Procedures

.15 Pre-License Review

The Pre-License Review course is designed to provide a timely review of the training topics most likely to appear on the NRC examination. The review course familiarizes the applicants with NRC examination category topics and minimizes the possibility of a knowledgeable operator failing the NRC examination due to a lack of familiarity with examination topics or techniques. The course will include subjects which were demonstrated as weak areas on the audit exam and recent plant experience and modifications.

A.2 "Self-Study" Phase

The Self-Study Phase of the training program is designed to help the trainee gain a more indepth knowledge and a better understanding of plant systems and their operation, plant procedures (normal, abnormal, emergency, and administrative) and miscellaneous material (technical specifications, annunciators, special orders, 10 CFRs, etc.) by providing a checklist for self evaluation accomplishment of study objectives and documentation for the successful completion of the oral checkout. The major modules are listed as:

Module	Contact Hours/Duration
.1 Systems	---

The Systems module of the self-study phase is designed so that the students may further develop their study skills and gain increased understanding of plant systems and operation. This is accomplished by formalizing the self-study module, providing the student with learning objectives and a list of reference materials and instructions/guidelines on completing the module.

The list of systems contained in this module may consist of, but is not limited to:

* Reactor Coolant and Pressurizer
* Makeup, Letdown, and Purification
* Control Rod Drive
* Component and Turbine Plant Cooling Water
* Fuel Handling
* Spent Fuel Cooling
* High Pressure Injection
* Low Pressure Injection
* Core Flood
* Auxiliary Feed
* Reactor Buidling Spray
* Emergency Diesel
* Safety Features Actuation
* Main and Auxiliary Steam
* Main Turbine and Generator
* Reactor Protection
* Radiation Monitoring
* Fire Protection

Module	Contact Hours/Duration
A.2 .2 Procedures	---

The Procedures training module is designed to help the trainee gain more knowledge and understanding of overall plant, casualty, emergency, and administrative procedures. This is accomplished by formalizing the procedure module of the self-study phase, providing the students with learning objectives and a list of reference materials, and instructions/guidelines on completing the module.

The list of procedures contained in this module may consist of, but is not limited to:

Overall Operating Procedures

* Plant Heatup and Startup
* Normal Operations
* Plant Shutdown and Cooldown

Casualty Procedures

* Loss of Component and Plant Cooling Water
* Loss of Plant Air
* Loss of Lube Oil
* Loss of Condenser Vacuum
* Loss of Subcooled Natural Circulation
* Earthquake
* Loss of NNI Power
* Inadequate Core Cooling

Emergency Procedures

* Load Rejection
* Reactor/Turbine Trip
* Loss of Reactor Coolant/Pressure
* Steamline/Feedline Failure
* Reactor Coolant Pump/Motor Emergencies
* Loss of Control Room

Administrative Procedures

* Responsibilities and Authorities
* Work Requests
* Administrative Clearance
* External Plant Reports
* Occurrence Description Reports
* Control Room Watchstanding
* Control of Special Orders
* Abnormal Tags
* Tool and Equipment Control

Module	Contact Hours/Duration
A.2 .3 Miscellaneous Materials	---

The Miscellaneous Materials training module is designed to further enhance the trainee's understanding of plant design and operation and to assist the trainee in the study of the different areas of this module. This is accomplished by formalizing the self-study module, providing the student with a list of learning objectives, and a list of reference materials, and instructions/guidelines on completing the module.

The list of subjects covered in this module may consist of, but is not limited to:

* Technical Specifications
* FSAR Chapter 14, Safety Analysis
* 10 CFR 20
* 10 CFR 55
* Emergency Plan
* Radiation Control Manual
* Heat Transfer and Fluid Flow Review
* Reactor Physics Review

A.3 Job Training Phase ---

The Job Training phase consists of:

* Simulator Training
* On-The-Job Training
* Test Reactor Training

The Job Training phase is designed to help the trainee develop increased awareness and gain a "feel" for plant operations and controls and to develop a greater sense for plant responses under varying conditions.

Module	Contact Hours/Duration
.1 Simulator Training	Approx 4 Weeks

The Simulator Training module provides the opportunity to learn and practice normal, abnormal, and emergency operating procedures in a realistic setting without interfering with normal plant operations. The purpose of the module is to enhance plant safety and reliability. The module is normally separated into three (3) distinct segments.

* Simulator Orientation
* Startup Certification
* Normal and Transient Operation

Module	Contact Hours/Duration

A.3 .1 Simulator Training (Continued)

The Orientation segment familiarizes the trainee with the simulator and its capabilities. The Startup Certification segment allows the operator to manipulate reactivity controls during a startup. The Transient segment requires the trainee to perform various plant evolutions and respond to malfunctions and subsequent transients and is designed to place emphasis on Control Room operations, especially emergency and casualty operations.

The following is a list of simulator exercises:

.1 Plant or reactor startups to include a range that reactivity feedback from nuclear heat addition is noticeable and heatup rate is established.

.2 Plant shutdown.

.3 Manual control of steam generators and/or feedwater during startup and shutdown.

.4 Boration and/or dilution during power operation.

.5 Any significant (>10%) power change in manual rod control.

.6 Any reactor power change of 10% or greater where load change is performed with load limit control on manual.

.7 Loss of coolant including:

.1 Significant Steam Generator Leaks

.2 Inside and Outside Primary Containment

.3 Large and Small, Including Leak-Rate Determination

.4 Saturated Reactor Coolant Response

.8 Loss of electrical power (and/or degraded power sources).

.9 Loss of core coolant flow/natural circulation.

.10 Loss of condenser vacuum.

.11 Loss of shutdown cooling.

.12 Loss of Component Cooling System or cooling to an individual component.

Module	Contact Hours/Duration

A.3 .1 Simulator Training (Continued)

.13 Loss of normal feedwater or normal feedwater system failure.

.14 Loss of all feedwater (normal and emergency).

.15 Loss of protective systems channel.

.16 Mispositioned control rod or rods (or rod drops).

.17 Inability to drive control rods.

.18 Conditions requiring use of emergency boration.

.19 Fuel cladding failure or high activity in reactor coolant.

.20 Turbine or generator trip.

.21 Malfunction of automatic control system(s) which affect reactivity.

.22 Malfunction of reactor coolant pressure/volume control system.

.23 Reactor trip.

.24 Main steam line break (inside or outside containment).

.25 Nuclear instrumentation failure(s).

.2 One-The-Job Training — Approx 3 Months

The On-The-Job Training module is designed to provide hands-on training on the control and operation of plant systems and procedures with particular emphasis on Control Room activities to maintain awareness of Rancho Seco plant status and operating conditions. The candidates are assigned to operating shifts during this period to maximize the opportunities for each applicant to participate in Control Room operations.

Each candidate is issued a training book consisting of training guides and checksheets that are required to be completed as a prerequisite for the NRC examination.

Module	Contact Hours/Duration

A.3 .2 One-The-Job Training (Continued)

The On-The-Job Training module may consist of the following checksheets:

* Plant Startup
* Plant Shutdown
* Reactor Coolant Pump Start/Stop with Reactor Critical
* Manual Rod Control for Plant Transients
* Reactor Operations Involving Emergency or Special Procedures Where Reactivity is Changed
* Refueling Operations
* Surveillance Testing
* Additional Plant Evolutions and Control Manipulations

.3 Test Reactor Training — Approx 2 Weeks

The Test Reactor Training module contains instruction on the practical application of reactor theory concepts to reactor operation. Demonstration and laboratory sessions allow the trainee to perform reactivity manipulations and observe and measure actual core responses.

The methods of training utilized are classroom discussion and training reactor operation. Principles and procedures are discussed prior to demonstrations and laboratory sessions to familiarize the trainee with upcoming exercises. Experiments and demonstrations are conducted with emphasis on their application to reactor operations. The use and compliance with operating procedures is stressed. Critiques following the experiments reinforce the skills and knowledge gained.

Experiments and demonstrations that typically may be performed in this module are:

* Unloading/Loading Fuel
* Instrument Calibration
* 1/M Approach to Criticality
* Reactor Startup and Shutdown
* Power Level Changes and Control Rod Reactivity Effects
* Nuclear Instrumentation Performance
* Reactivity Measurements
* Moderator Temperature Coefficient Effects

Module	Contact Hours/Duration
A.4 Pre-License Audits	---

Pre-License Audit examinations are administered to all candidates. The contents of the written examinations closely parallel NRC examinations. In addition, each applicant will participate in an oral operating/demonstrating examination.

The written and oral examinations are administered and graded using NRC examining and grading techniques. The corrected written examinations are returned to the students for review purposes. At the conclusion of each oral examination, the examiner immediately reviews the results of the examination with the student. The results of the audits will be used to determine areas requiring additional emphasis in training prior to the NRC examination.

APPENDIX B

SENIOR OPERATOR TRAINING PROGRAM

The Senior Operator Training Program is designed to provide to the trainee a more thorough understanding of the underlying principles of various theoretical subjects pertaining to his job and the concepts of supervision and management skills necessary to direct subordinates to ensure compliance with applicable regulations, guidelines, and specifications.

The Senior Operator Training Program is divided into three (3) basic phases. They are the "Classroom" phase, the "Self-Study" phase, and the "Job Training" phase. The components of each phase with a brief description are:

B.1 Classroom Phase

The Classroom Phase of the Senior Operator Training Program consists of formal classroom presentation of academic subjects, nuclear power plant related technologies and procedures designed especially to enhance the trainees technical maturity and to provide the trainee with an understanding of principles and analytical ability beyond that required of the Control Room Operator. Courses in the classroom phase of the Senior Operator Program are:

	Course	Contact Hours/Duration
.1	Reactor Theory	Approx 1 Week

The purpose of the Reactor Theory course is to relate the theoretical concepts of reactor physics and kinetics to actual conditions occuring in the plant. The course presents detailed instruction on the theoretical basis of reactor operation, and provide the trainee with an increased knowledge of the dynamics of reactor kinetics.

The course provides instruction in nuclear physics, radiation, neutron life cycle, binding energy, nuclear reactions, and reactivity. It also provides information to describe neutron sources, subcritical multiplication, fission product poisons, and their effects on reactor response. Special emphasis is placed on reactor subcritical and critical plant operations, decay heat production, and power distribution.

	Course	Contact Hours/Duration
B.1 .2	Heat Transfer and Fluid Flow	Approx 1 Week

The purpose of the heat transfer and fluid flow course is to relate the theoretical concepts of fluid dynamics, heat production, and transfer to actual conditions occuring in the plant. This will allow the student to recognize and assess the thermal-hydraulic effects of plant transient and accident conditions and implement an appropriate response.

The course provides instruction in the areas of heat transfer, thermodynamics, heat transfer application behavior of fluids, and fluid flow applications. Special emphasis is placed on methods of recognizing and optimizing natural convection coolant flow, potential problems with core flow, the mechanisms of heat transfer from the fuel pellets to the ultimate heat sink during transient and accident conditions, and methods available to verify heat transfer from the fuel to the coolant and from the coolant to theheat sink. It also includes instruction on pump theory, power plant cycles, and systems and components.

.3	Plant Chemistry	Approx 8 Hours

The purpose of the Plant Chemistry course is to increase the Senior Operator Trainee's knowledge of the theoretical bases and plant applications of plant chemistry control. This will allow the Senior Operator to better understand the importance and methods of maintaining plant chemistry control. The course presents information on chemistry fundamentals, corrosion, and chemistry control.

The course provides instruction in the following areas: fundamental chemistry concepts; corrosions mechanisms and prevention; crud formation and effects; radiation chemistry; hydrogen production; primary, secondary, and steam generator chemistry; and hazards and safety requirements associated with chemicals and gases found in the plant.

.4	Radiation Protection	Approx 16 Hours

The purpose of the Radiation Protection course is to increase the scope of the Senior Operator Trainee's knowledge in the theoretical bases and practical application of health physics. This will allow the trainee to fulfill the additional responsibilities of the Senior Operator in these areas. The course presents information on radiation and its effects, radiation monitoring, and radiological control.

Course	Contact Hours/Duration

B.1 .4 (Continued)

The course provides information in the following areas concerning radiation: detector principle; instruments; units and concepts of measurement; effects of matter; 10 CFR 20; contamination control; methods of reducing exposure; and the ALARA Program. Special emphasis is placed on the barriers between radioactivity in the fuel and the environment.

.5 Electrical Theory — Approx 16 Hours

The purpose of the Electrical Theory course is to increase the scope of the Senior Operator Trainee's knowledge of electrical theory and electrical systems. This will allow the trainee to fulfill the additional responsibilities of the Senior Reactor Operator in the areas of electrical systems operations. The course presents information on electrical theory and electrical systems operation and control.

The course provides instruction in electrical theory, electrical design, and relay theory and application. Special emphasis is placed on control circuits for inplant distribution and utility grid function, and the relationship between plant output and the utility's grid.

.6 Material Science — Approx 24 Hours

The purpose of the material science course is to increase the Senior Operator Trainee's understanding of plant design criteria and limitations on plant operations imposed by plant materials. This knowledge will help the Senior Operator to recognize and assess the material and structural effects of plant transient and accident conditions and implement an appropriate response. The course provides instruction on the structure and properties of engineering materials and the applications of these materials within the plant.

The course presents information on the structure of properties of materials, including types of bonds, and stress-strain considerations. Instruction is included on failure mechanisms, destructive and non-destructive testing, brittle fracture and radiation effects. It also presents information on selection of materials for nuclear and steam plant use, nuclear fuel design, and material imposed operational limits.

	Course	Contact Hours/Duration
B.1 .7	Systems and Procedures	Approx 2 Weeks

The purpose of the Systems and Procedures course is to increase the Senior Operator Trainee's scope of knowledge in systems, system operations, and system interrelationships. This will help to allow the trainee to fulfill the additional responsibilities of the Senior Operator. This course presents information on selected plant systems and operating procedures.

The course provides instruction in system operating limits, design, precautions, procedures, and modes of operation. Special emphasis will be placed on reactor safeguards and control systems and operations. The systems presented may include:

* Emergency Core Cooling
* Safety Features Actuation
* Non-Nuclear Instrumentation
* Control Rod Drives
* Reactor Protection

.8	Refueling	Approx 24 Hours

The Refueling course presents detailed instruction on the components, systems, precautions and procedures associated with the core refueling and the handling of new and spent fuel. The purpose is to prepare the Senior Operator to safely and effectively supervise refueling operations.

This course provides instruction on the actions necessary to safely handle new or irradiated fuel assemblies and control components. It includes the equipment used to handle fuel and control components along with systems required to support refueling. The course is structured to permit some variations in the sequence of lesson presentation. The trainee's ability to understand a topic may depend on understanding of preceding topics.

.9	Accident and Transient Prevention, Mitigation, and Response	Approx 2 Weeks

The purpose of the Accident and Transient Prevention, Mitigation, and Response course is to increase the Senior Operator Trainee's knowledge of transient and accident analysis. This will allow the Senior Operator to recognize and assess plant transient and accident conditions and implement an appropriate response. The course presents instruction on transient and accident conditions that have been analyzed and provides the necessary knowledge to enable the operator to recognize a condition that has not been analyzed.

	Course	Contact Hours/Duration

B.1 .9 (Continued)

The course provides instruction in Emergency and Casualty Procedures, basic reactor protection analysis safety limits and setpoints, cooling mechanisms, and reactor and radiological instrumentation.

.10 Procedures and Bases — Approx 2 Weeks

The purpose of the Procedures and Bases course is to increase the scope of the Senior Operator Trainee's knowledge of procedures and requirements, and to ensure his understanding of the bases for these procedures and requirements. This will allow the trainee to fulfill the additional responsibilities of the Senior Operator in these areas. The course presents instruction on procedures, specifications, requirements, and bases that affect the position of the Senior Operator.

The course provides instruction on the duties and responsibilities of the Senior Operator and the contents and bases for control documents that influence plant operations. Material is presented on administrative and operational procedures, Safety Analysis Section of the FSAR, the Emergency Plan, and Technical Specifications.

.11 Process Instrumentation — Approx 8 Hours

The Process Instrumentation course presents instruction on the fundamentals of process variables measurement. It includes a study of temperature, pressure, flow level, and position indication. The purpose is to provide the trainee with a review of the construction and operation of various process instruments covered in the Licensed Operator course.

The course provides a review of fundamental process variables and general modes of instrument failure. The course is structured to permit variations in the sequence in which topics are presented.

Course	Contact Hours/Duration
B.1 .12 Pre-License Review	Approx 1 Week

The Pre-License Review course is designed to provide a timely review of the training topics most likely to appear on the NRC examinations. The review course familiarizes the applicants with NRC examination category topics and minimizes the possibility of a knowledgeable operator failing the NRC examination due to a lack of familiarity with examination topics or examination techniques. The course will include subjects which were demonstrated weak areas on the audit exam, and recent plant experiences and modifications.

The course presents a review of material previously taught in the Senior Operator Training Program. Subjects that may be presented are listed below. The specific material covered in any particular subject depends on the needs of the trainees as determined by past performance, especially on the audit exams taken just prior to this course and may include:

* Reactor Theory
* Heat Transfer and Fluid Flow
* Reactor Protection
* Safety Features Actuation
* Integrated Control System
* Nuclear and Non-Nuclear Instrumentation
* Electrical Distribution
* Mitigating Core Damage
* Plant Procedures
* Emergency Plan
* Technical Specifications

B.2 Self-Study Phase ---

The Self-Study phase of the training program is designed to help the trainee to gain a more indepth knowledge and a better understanding of plant systems and their operation, plant procedures (normal, abnormal, emergency, and administrative), and miscellaneous material (technical specifications, annunciators, 10 CFR, special orders, admin procedures, etc.) by providing a checklist for self-evaluation, accomplishment of study objectives, and documentation for the successful completion of oral checkouts. The major modules are:

B.2 .1 Systems ---

The Systems module of the self-study phase is designed so that the students may further develop their study skills and gain increased understanding of plant systems and operation. This is accomplished by formalizing the systems module of the self-study phase, providing the student with learning objectives and a list of reference material and instructions/guidelines on completing the module.

The list of systems contained in this module may consist of, but is not limited to:

* Reactor Protection
* Safety Features Actuation
* Decay Heat Removal
* Feed and Condensate
* Turbine and Generator
* Integrated Control
* Nuclear and Non-Nuclear Instrumentation
* Cooling WAter
* Reactor Coolant and Reactor Coolant Pumps
* Makeup and Purification
* Control Rod Drive
* Electrical Distribution
* Fuel Handling
* Radiation Monitoring

.2 Procedures ---

The Procedures module of the self-study phase is designed to help the trainee gain more knowledge and understanding of overall plant, casualty, emergency, and administrative procedures. This is accomplished by formalizing the procedures module of the self-study phase, providing the student with learning objectives and a list of reference materials and instructions/guidelines on completing the module.

The list of procedures contained in this module may consist of, but is not limited to:

Overall Operating Procedures

* Plant Heatup and Startup
* Normal Operations
* Plant Shutdown and Cooldown

B.2 .2 (Continued)

Casualty Procedures

* Loss of Component ar Plant Cooling Water
* Loss of Plant Air
* Loss of Lube Oil
* Loss of Condenser Vacuum
* Loss of Subcooled Natural Circulation
* Earthquake
* Loss of NNI Power
* Inadequate Core Cooling

Emergency Procedures

* Load Rejection
* Reactor/Turbine Trip
* Loss of Reactor Coolant/Pressure
* Steamline/Feedline Failure
* Loss of Control Room

Administrative Procedures

* Responsibilities and Authorities
* Work Requests
* Administrative Clearance
* External Plant Reports
* Occurrence Description Reports
* Control Room Watchstanding

.3 Miscellaneous Materials ---

The Miscellaneous Materials module of the self-study phase is designed to further enhance the trainee's understanding of plant design and operation and to assist the trainee in the study of the different areas of this module. This is accomplished by formalizing the miscellaneous materials module of the self-study phase, providing the trainee with learning objectives and a list of reference materials and instructions/guidelines on completing the module.

The list of subjects covered in this module may consist of, but is not limited to:

* Technical Specifications
* FSAR Chapter 14 Safety Analysis
* 10 CFR 20
* 10 CFR 55
* Emergency Plan
* Radiation Control
* Heat Transfer and Fluid Flow
* Reactor Physics Review

B.3 Job Training Phase

The Job Training phase is divided into two (2) modules consisting of:

* Simulator Training
* On-The-Job Training

The Job Training phase is designed to help the trainee develop increased awareness and gain a "feel" for plant operations and controls and to develop a greater sense for plant responses under varying conditions.

Module	Contact Hours/Duration
.1 Simulator Training	Approx 1 Week

This module contains training to develop and improve the trainee's skills in transient/accident response, and his supervisory and diagnostic capabilities.

The purpose of the module is to prepare the Senior Operator to supervise routine evolutions proficiently, to recognize abnormal or emergency conditions, to respond to accidents and transients, and to return the plant to safe and stable conditions.

The following is a list of simulator exercises:

.1 Plant or reactor startups to include a range that reactivity feedback from nuclear heat addition is noticeable and heatup rate is established.

.2 Plant shutdown.

.3 Manual control of steam generators and/or feedwater during startup and shutdown.

.4 Boration and/or dilution during power operation.

.5 Any significant (>10%) power change in manual rod control.

.6 Any reactor power change of 10% or greater where load change is performed with load limit control on manual.

.7 Loss of coolant including:

.1 Significant Steam Generator Leaks

.2 Inside and Outside Primary Containment

.3 Large and Small, Including Leak-Rate Determination

B.3 Job Training Phase (Continued)

.1 .7 .4 Saturated Reactor Coolant Response

.8 Loss of electrical power (and/or degraded power sources).

.9 Loss of core coolant flow/natural circulation.

.10 Loss of condenser vacuum.

.11 Loss of shutdown cooling.

.12 Loss of Component Cooling System or cooling to an individual component.

.13 Loss of normal feedwater or normal feedwater system failure.

.14 Loss of all feedwater (normal and emergency).

.15 Loss of protective systems channel.

.16 Mispositioned control rod or rods (or rod drops).

.17 Inability to drive control rods.

.18 Conditions requiring use of emergency boration.

.19 Fuel cladding failure or high activity in reactor coolant.

.20 Turbine or generator trip.

.21 Malfunction of automatic control system(s) which affect reactivity.

.22 Malfunction of reactor coolant pressure/volume control system.

.23 Reactor trip.

.24 Main steam line break (inside or outside containment).

.25 Nuclear instrumentation failure(s).

.2 On-The-Job Training Approx 3 Months

The On-The-Job Training module contains a study guide and system checksheets that are required to be completed during the on shift period. The purpose of the On-The-Job module is to help the trainee to develop an increased awareness of procedures and operational requirements.

B.3 .2 (Continued)

The On-The-Job Training checksheets that comprise this module are designed to assist the trainee in gaining experience in selected Control Room activities and document the performance of those activities. This will aid the candidate in assuming the added responsibilties of the Senior Operator.

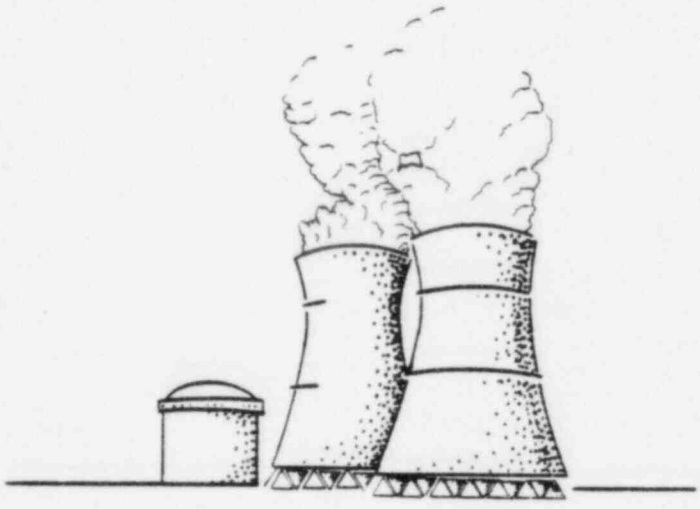
Checksheets contained in this module include:

* Shutdown Margin Calculations
* Reactivity Balance Calculations
* Estimated Critical Position (ECP) Calculations
* Control Exercises

B.4 Pre-License Audits

Pre-License Audit examinations are administered to all candidates. The contents of the written examinations closely parallel NRC examinations. In addition, each applicant will participate in an oral operating/demonstrating examination.

The written and oral examinations are administered and graded using NRC examining and grading techniques. The corrected written examinations are returned to the students for review purposes. At the conclusion of each oral examination, the examiner immediately reviews the results of the examination with the student. The results of the audits will be used to determine areas requiring additional emphasis in training prior to the NRC examination.



RANCHO SECO

NUCLEAR GENERATING STATION

UNIT ONE

HERALD, CALIFORNIA

TOPICAL REPORT T2-80

nrc licensed operator retraining program

REV 1

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SACRAMENTO MUNICIPAL UTILITY DISTRICT

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TOPICAL REPORT T2-80

REV 1

SACRAMENTO MUNICIPAL UTILITY DISTRICT

RANCHO SECO

NUCLEAR GENERATING STATION

OPERATOR TRAINING PROGRAM

FOR

NRC LICENSED OPERATOR RETRAINING PROGRAM

REQUALIFICATION TRAINING PROGRAM

1.0 PURPOSE

The purpose of this report is to formally establish the programs, responsibilities, and requirements for the requalification of NRC Licensed Senior Operators and Reactor Operators at the Rancho Seco Nuclear Generating Station, Unit 1. The programs and contents established by this plan shall be enforced and adhered to for the life of the plant.

This program is established to meet the requirements of Appendix A of 10 CFR 55 necessary for renewal of licenses in accordance with Section 55.33 of 10 CFR 55.

This Requalification Program is subject to approval by the Nuclear Regulatory Commission. In accordance with 10 CFR 50.54 (i-1), no changes shall be made in this program to reduce the scope or time allotted without prior approval by the NRC.

2.0 REFERENCES

.1 ANSI/ANS 3.1-1978, Selection and Training of Nuclear Power Plant Personnel

.2 10 CFR 50, Licensing of Production and Utilization Facilities

.3 10 CFR 55, Operators' License

3.0 DEFINITIONS

The following terms are defined for uniform interpretation of this document:

.1 Controls -- When used with respect to a nuclear reactor, means apparatus and mechanisms; the manipulation of which directly affect the reactivity or power level of the reactor.

.2 Drill -- A supervised training exercise or walk-through conducted or simulated in a work environment for the purpose of developing and maintaining skills required to cope with plant abnormal/emergency conditions and including an evaluation of performance.

.3 Examination -- A test used to measure knowledge, skills, or achievement in one or more subjects.

.4 Facility -- Means any production facility or utilization facility as defined per 10 CFR 50.2. Namely, "Utilization Facility" which means any nuclear reactor other than one designed or used primarily for the formation of plutonium.

DEFINITIONS (Continued)

3.5 Instructional Hour or Contact Hour -- A one-hour period of training in which course instructor (the appropriate supervisor in on-the-job training phase) is present or readily available for instructing or assisting the trainee. One hour devoted to any of the following activities is considered an instructional hour under this definition.

* Programmed Learning
* Supervised Study
* Lectures
* Discussions
* Problem Solving Sessions
* Quizzes
* Examinations
* On-The-Job Training
* Laboratory Exercises
* Simulator Training and Exercises

.6 Quiz -- A relatively short test used to measure achievement on material taught recently or on any small, newly completed unit of study.

.7 Operator -- An individual who manipulates controls of a facility. An individual is deemed to manipulate a control if he/she directs another to manipulate a control.

.8 Senior Operator -- An individual designated by a facility licensee under 10 CFR 50 to direct the licensed activities of licensed operators.

.9 Simulator -- A working model of the Control Room similar to the plant for which an individual is licensed or is a candidate for license. May considered a "simulator" provided it reproduces the general operating characteristics of the plant with similar arrangements of instrumentation and controls.

.10 Simulate -- When an individual performs a walk-through of actions to be taken, using the control panel involved, discussing each step without actually operating any controls, he/she has "simulated" the operation. This method is used as a means of teaching or reviewing actions required by an emergency or abnormal condition.

4.0 PROGRAM REQUIREMENTS

.1 Schedule

The Requalification Program shall be conducted for a continuous period not to exceed two years. Successive requalification programs using generally the same format and schedule shall follow the first in a continuous cycle of two-year programs.

PROGRAM REQUIREMENTS (Continued)

4.2 Lectures

The Requalification Program shall include preplanned lectures to be given throughout the two-year period. Lectures will normally be scheduled to average sixty hours per man to accommodate all licensed personnel during the Requalification Program cycle; however, the schedule may take into consideration heavy vacation periods and infrequent operations such as refueling periods and forced outages. Lectures may be deferred due to unanticipated shutdowns, but shall be conducted as soon as practicable thereafter. Lectures may consist of preplanned supervised classroom discussions or seminars.

Films, video tapes, programmed instruction and other effective training aids may be used to supplement lectures; however, an instructor shall participate in at least thirty hours of lecture series.

Lecture content shall take into consideration the following:

.1 Theory and Principles of Operation

.2 General and Specific Plant Operating Characteristics

.3 Plant Instrumentation and Control Systems

.4 Plant Protection Systems

.5 Engineered Safety Systems

.6 Normal, Casualty, and Emergency Operating Procedures

.7 Radiation Control and Safety

.8 Technical Specifications

.9 Applicable Portions of Title 10, Chapter 1, Code of Federal Regulations

.10 Principles of Heat Transfer, Fluid Flow, and Thermodynamics

.11 Operating Experiences from Similar Plants such as TMI-2 and Lessons Learned

.12 Mitigation of Accidents Involving a Degraded Core

.13 Results of Annual Examinations

4.3 On-The-Job Training

The Requalification Program shall include on-the-job training consisting of:

.1 Control Manipulations

Each Licensed Senior Operator and Operator shall participate as much as possible in plant control manipulations involving reactivity changes to demonstrate his/her skill and/or familiarity with reactivity control systems. Enclosure 1 delineates the control manipulations required by Appendix A, Paragraph 3a, of 10 CFR 55.

.2 Simulator Training

Each Licensed Senior Operator and Operator shall participate in simulator training during the term of his/her license. A simulator shall be used in meeting the requirements of Section 4.3.1 above for evolutions not performed at the plant.

.3 Procedure Review Training

.1 Each Operator shall review the contents of all emergency, casualty, and applicable security procedures at least once per retraining cycle.

.2 Applicable training methods are described in Section 4.4. Training in this area shall be included in the preplanned schedule of the retraining cycles.

.3 Other Areas of Training

.1 Training of topics that cannot usually be preplanned as part of the retraining cycle will be conducted as necessary to ensure each Licensed Senior Operator or Operator is cognizant of:

.1 Facility Design Changes

.2 Procedure Changes

.3 Facility License Changes

.4 Applicable Operating Experiences

4.3 .3 .4 Miscellaneous Training Methods

.1 Training in addition to the preplanned lectures per 4.2 may be conducted to supplement the schedule lectures or to conduct training on other areas outlined in Sections 4.3.3 and 4.3.4.

.2 Acceptable methods used for this training may include, but are not limited to:

.1 Brief lectures conducted by the Shift Supervisor or other appropriate personnel.

.2 Staff meeting.

.3 Written communications to each licensed individual from facility management.

.4 Explanation of major changes as part of the preplanned lecture series.

.5 Supervised discussion.

.5 Evaluation and Observation

The Requalification Program shall include an evaluation and observation system to obtain the maximum benefits from the retraining program and as a method to determine to determine areas in which retraining is needed. The evaluations and observations will be conducted by the Training Superintendent or his designated representative.

Licensed Senior Operators or Operators may be assigned to one or more examination groups and the annual examinations for their groups are conducted on different dates. Individuals may be shifted between groups and individuals receiving an initial license may be placed in any group as long as the period between annual examinations or between the license effective date and the first annual examination does not exceed thirteen (13) months.

It is not required that the individual(s) preparing or reviewing the examination (up to a maximum of 3) also take the examination. The examination and observation process shall include:

.1 Annual Written Exams

4.3 .3 .5 .1 .1 Written examinations shall be administered at 11 to 13-month intervals, depending on plant scheduling. The examination shall follow the guidelines of 10 CFR 55 Appendix A and will be used as a system to determine Licensed Operator and Senior Operator knowledge of subjects covered in the Requalification Program; normal, abnormal, and emergency procedures; and as a method to determine areas in which retraining is needed to upgrade Licensed Operator and Senior Operator knowledge.

.2 An Operator scoring above 80% in all sections of the annual requalification examination shall not be required to attend further requalification lectures until the next annual requalification examination. Other Operators may be excused from lectures in subjects for which they scored above 80%, but shall be required to attend lectures on all other topics. If, in the opinion of the Plant Superintendent, an individual has justifiable cause, such as sickness or emergency shift coverage, the individual may be excused from required assigned lectures up to a maximum of 20% of the allotted total lecture time. The individual shall be assigned reading material on a self-studying basis to fulfill missed lecture time.

.3 Licensed personnel will be suspended from licensed duties when:

A) Overall grade on the annual written examination is less than 80% overall or less than 70% in a category.

OR

B) Annual oral examinations or evaluations made by supervisors and/or training staff members of the performance and competency of licensed personnel during actual or simulated abnormal and emergency conditions clearly indicate theneed for accelerated training.

Waiver of suspension from licensed duties will be considered if the Plant Superintendent develops an Operation and Training Review Board consisting of the Operating Superintendent and the Training Superintendent. After evaluation and review of the licensed individual's past performance, deficiencies, and recommended training programs, waiver of suspension may be granted. The evaluation shall be completed within seven working days of the original

4.3 .3 .5 .1 .3 B) (Continued)
findings. Accelerated training and re-examination must be completed within 30 days of the Boards' recommendation.

.2 Quizzes

From time to time, written quizzes will be administered to determine the Licensed Operator and Senior Operator's knowledge of particular subjects covered in lectures or specific reading assignments as determined by the Training Supervisor. Any individual scoring less than 80% on a quiz shall receive additional training in the weak areas until sufficient knowledge is obtained as evidenced by a requiz or an oral evaluation.

.3 Observations

Systematic observation and evaluation of the peformance and competency of Licensed Senior Operators and Operators will be made by the Training Superintendent or his designated representative.

Such observations should also include evaluations including actions taken during actual or simulated abnormal and emergency conditions.

.1 Each Licensed Senior Operator or Operator shall participate in an annual oral examination with the Training Superintendent or his designated representative. The examination and evaluation shall consist of:

.1 A discussion of required actions during abnormal and emergency conditions.

.2 A simulation of abnormal and emergency conditions while in the Control Room showing each action and controlling device to be operated.

.2 Should the performance of the licensed Senior Operator or Operator be deemed unsatisfactory, the Senior Operator or Operator will participate in an accelerated review program tailored to place emphasis where there is a clear indication of need.

.3 Upon completion of the accelerated review program, the individual shall be subject to re-examination.

PROGRAM REQUIREMENTS (Continued)

4.3 .3 .6 Records and Documentation

.1 Training files shall be maintained in a format that is auditable to verify that retraining is conducted in accordance with this requalification program and shall meet the requirements of Appendix A, Paragraph 5 of 10 CFR 55.

.2 Records and documentation shall be in accordance with administrative procedures.

.7 Inactive License

.1 Pursuant to 10 CFR 55.31(e), any Licensed Senior Operator or Operator who has not been performing the function of an Operator or Senior Operator for a period of four (4) months or longer shall, prior to resuming licensed activities, complete the following requirements to demonstrate satisfactory knowledge and understanding of facility operations and administration by:

.1 Complete all individual study assignments made during the period of his absence.

.2 Review all significant changes to operator procedures, license changes, plant design changes, and special orders for the period of his absence.

.3 Meet with the Training Superintendent or his designated representative to cover the material in all requalification lectures for which attendance was required but missed.

.4 Successfully complete an oral examination and evaluation approved by the Plant Superintendent to demonstrate that his knowledge and understanding of the facility is satisfactory.

.5 The Plant Superintendent must certify to the NRC that the Senior Operator or Operator is requalified. Approval must be received from the NRC that the Senior Operator or Operator's requalification is satisfactory before resuming activities for which he is licensed.

4.3 .3 .8 Senior Operator Trainees

Operators who currently hold active NRC licenses and are enrolled in the Rancho Seco Senior Operator Training program may be exempt from attending the requalification lectures requirements of Section 4.2 and simulator training requirements of Section 4.3.2 and will not be subject to 4.7 above.

.9 Instructors

.1 Instructors who teach safety systems, integrated responses, transients and simulator courses shall demonstrate their competency to NRC by successful completion of a Senior Operator examination.

For instructors who have appropriate experience/expertise in the above areas but do not meet the requirements, a competent instructor will be in attendance during the class.

Instructors shall be enrolled in appropriate requalification programs to assure they are cognizant of current operating history problems and changes to procedures and administrative limitations.

5.0 ENCLOSURES

.1 Control Manipulations

The following control manipulations and plant evolutions where applicable to plant design are acceptable for meeting the reactivity control manipulations required by Appendix A, Paragraph 3.a of 10 CFR Part 55. The starred items shall be performed on an annual basis; all other items shall be performed on a two-year cycle. Each individual shall perform or participate in a combination of reactivity control manipulations based on the availability of plant equipment and systems. Those control manipulations which are not performed at the plant may be performed on a simulator. The use of technical specifications should be maximized during the simulator control manipulations. Personnel with senior licenses are credited with these activities if they direct or evaluate control manipulations as they are performed.

.1* Plant or reactor startups to include a range that reactivity feedback from nuclear heat addition is noticeable and heatup rate is established.

ENCLOSURES (Continued)

5.1 .2 Plant shutdown.

.3* Manual control of steam generators and/or feedwater during startup and shutdown.

.4 Boration and/or dilution during power operation.

.5* Any significant (>10%) power change in manual rod control.

.6 Any reactor power change of 10% or greater where load change is performed with load limit control on manual.

.7* Loss of coolant including:

.1 Significant Steam Generator Leaks

.2 Inside and Outside Primary Containment

.3 Large and Small, Including Leak-Rate Determination

.4 Saturated reactor coolant response

.8 Loss of electrical power (and/or degraded power sources).

.9* Loss of core coolant flow/natural circulation.

.10 Loss of Condenser vacuum.

.11 Loss of shutdown cooling.

.12 Loss of Component Cooling System or cooling to an individual component.

.13 Loss of normal feedwater or normal feedwater system failure.

.14* Loss of all feedwater (normal and emergency).

.15 Loss of protective systems channel.

.16 Mispositioned control rod or rods (or rod drops).

.17 Inability to drive control rods.

.18 Conditions requiring use of emergency boration.

.19 Fuel cladding failure or high activity in reactor coolant.

.20 Turbine or generator trip.

ENCLOSURES (Continued)

5.1 .21 Malfunction of automatic control system(s) which affect reactivity.

.22 Malfunction of reactor coolant pressure/volume control system.

.23 Reactor trip.

.24 Main steam line break (inside or outside containment).

.25 Nuclear instrumentation failure(s).

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TRAINING DIVISION

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