

Title
FUEL HANDLING SENIOR REACTOR OPERATOR TRAINING PROGRAM UNIT 2
(16219)

Revision No.
1-00

Applicability/Scope
FUEL HANDLING SRO CANDIDATES, UNIT 2

Responsible Office
TRAINING DEPT.

This document is important to safety Yes No

Effective Date

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	Signature	Concurring Organization Element	Date
Originator	<i>David L. ...</i>	Operator Training Manager	5-29-85
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FUEL HANDLING SENIOR REACTOR OPERATOR TRAINING PROGRAM UNIT 2Revision No.
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The purpose of the Fuel Handling Senior Reactor Operator Training Program is to maximize plant operating efficiency during defueling operations and ensure the safety of the plant personnel and the general public by developing and maintaining a staff of in-plant operating personnel with the theoretical and practical background necessary to enable them to:

- 1.1 Understand how and why specific tasks are performed.
- 1.2 Understand the consequences of their actions on defueling and overall plant operations.
- 1.3 Respond correctly to situations they may encounter during normal, abnormal, and emergency conditions.

2.0 SCOPE/APPLICABILITY

This procedure applies to all Fuel Handling Senior Reactor Operator candidates as designated by the Manager, Plant Operations.

3.0 DEFINITIONS

- 3.1 Fuel Handling Senior Reactor Operator (FHSRO) - an individual licensed by the Nuclear Regulatory Commission to supervise fuel handling and core alterations operations.
- 3.2 Task Examiner - an individual conducting a checkout on a specific OJT task and certifying by his/her signature on the OJT sheet that

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the task has been satisfactorily completed. The task examiners shall be designated as outlined in this program. (See Section 7.5.1 a/b.)

3.3 Extra Person - a candidate assigned to on-the-job training whose presence is not required to perform specific, non-training related tasks.

3.4 Instructor - a licensed or certified SRO member of the Training Department or a "guest" instructor whose expertise in a specific subject area, e.g. systems engineer, has resulted in his assignment, approved in writing by the Operator Training Manager or Manager, Plant Training to present material on that subject area. With the exception of guest lecturers, senior licensed or certified instructors must teach systems, integrated responses and transient behavior to licensed operators.

4.0 RESPONSIBILITIES

- 4.1 The Supervisor, Licensed Operator Training, is responsible for the following:
- a. General supervision of the development and conduct of the Fuel Handling SRO Training Program.

- b. Approval of the development, coordination, scheduling and administration of the Fuel Handling SRO Training Program, including course outlines, lesson plans, student handouts, simulator training and evaluation exams.
- c. Scheduling classes, students, classroom and facilities necessary to conduct the training program.
- d. Interfacing with Operations Department in all matters impacting the training programs.
- e. Assuring that the program content is updated and revised to meet current requirements and supervising revision of the program content, descriptions, lesson plans, and exams.
- f. Evaluation of course instruction and license candidate progress to determine the effectiveness of the training program and reporting these evaluations to the Operator Training Manager.
- g. Maintaining the necessary records and reports of training.
- i. Developing and conducting oral exams.
- j. Evaluation of candidate critiques of the training received.

4.2 The Operator Training Manager is responsible for the following:

- a. Assuring the quality of the Fuel Handling SRO Training Program by written approval of material including course outline, lesson plans, student handouts, simulator training, quizzes and exams and their compatibility with the Fuel Handling SRO Training Program.

- b. Certification of candidates in accordance with 4210-ADM-2610.01.
- c. Approval of guest lecturers.

4.3 The Manager, Plant Training is responsible for the following:

- a. To ensure that the training program is developed to meet the requirements established by the Director-TMI-2, through the Manager, Plant Operations, and that proper records and documentation are provided and maintained.
- b. Certification of candidates in accordance with 4210-ADM-2610.01.
- c. Approval of guest lecturers.

4.4 The Manager, Plant Operations is responsible for the following:

- a. To ensure that the overall level of training of plant operators is satisfactory through the approval of program content, schedules, and administrative procedures.
- b. Certification of candidates in accordance with 4210-ADM-2610.01.
- c. Designation of candidates to enter the Fuel Handling SRO Program.

4.5 The Director - TMI 2 is responsible for the following:

- a. Final certification of candidates in accordance with 4210-ADM-2610.01.

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- 5.1 Code of Federal Regulations, Section 10CFR55
- 5.2 Administrative Procedure 4210-ADM-2610.01
- 5.3 Code of Federal Regulations, Section 10CFR5C
- 5.4 4210-ADM-2610.01 Requirements for Certification of Operators for NRC Licenses

6.0 ATTACHMENTS

- 6.1 Appendix A - On-the-Job Checklists
- 6.2 Appendix B - Oral Exam Summary Sheet
- 6.3 Appendix C - Final Verification Examiner Designation
- 6.4 Appendix D - Addition/Deletion Letter Format
- 6.5 Appendix E - SRD Watchstanding Documentation

7.0 FUEL HANDLING REPLACEMENT PROGRAM**7.1 Prerequisites:**

All candidates for Fuel Handling Senior Reactor Operator shall:

1. Have a high school diploma or equivalency.
2. Have three years experience in operations or support of operations at a nuclear power plant.
3. Have one year supervisory experience.
4. Satisfactorily meet the minimum medical requirements for licensed personnel as specified in 10CFR55.

7.2 Content

1. The program consists of the following:
 - a. Classroom (Fundamentals, Defueling and Plant Systems)
 - b. OJT - Plant and Defueling Systems
 - c. Decision Analysis
 - d. Supervisory Development
 - e. Simulation Training - Research Reactor and Mockup
 - f. Audit Exams

The replacement program concludes with the NRC examination.

7.3 Objectives

- 7.3.1 The objectives of the program are to provide the Fuel Handling SRO with an applied knowledge of the principles of nuclear power plant operations and in particular the applied knowledge and skills of defueling operations including:

- a. Fundamentals of Fluid Flow, Heat Transfer, and Thermodynamics to enable the candidate to evaluate fuel handling and support operations performance through available monitoring devices.
- b. Mechanical Equipment Construction/Operation involved in the fuel handling and support operations.
- c. Reactor Physics to provide an understanding of the operation of a heat source and the effect of

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- operator actions on fuel performance. This topic area is to concentrate on subcritical operations.
- d. Criticality Safety to provide the candidate with an understanding of the concerns associated with handling fuel as it exists at TMI-2.
 - e. Radiation Protection to enable the candidate to incorporate ALARA considerations into operations.
 - f. Plant Fluid Systems interfacing with defueling operations.
 - g. Instrumentation and Control Systems to ensure the candidate can operate control systems under his cognizance.
 - h. Electrical Distribution Systems for defueling systems to provide the candidate with an understanding of the power systems established for defueling and support operations.
 - i. Administrative, Operating, Abnormal and Emergency procedures relating to defueling to enable the candidate to perform in accordance with established, approved methods of plant control and to respond to a variety of potential plant situations.
 - j. Fire System Training to enable the candidate to properly respond to fire emergencies.

- k. Industrial Safety Training to enable the candidate to practice the principles of personnel safety.
- l. Regulatory Guidelines Training to enable the candidate to understand the company - regulatory interface.
- m. Control Room/Fuel Handling Area interface training to enable the operator to promote effective and efficient operations.
- n. Fuel Handling SRO/Support organizations interface training to promote effective and efficient operations.

7.3.2 Certify the competency of applicants to direct defueling and core alteration operations in a safe and efficient manner by satisfactory achievement of specified learning objectives.

7.4 Outline

The Fuel Handling SRO Training Program is divided into four phases of training. These phases are:

- 1. Fundamentals Training
- 2. On-The-Job Training
- 3. Defueling Systems Training
- 4. Simulation Training

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This training is sequenced to provide the candidate with two periods of classroom training, practical on-the-job training and simulations training. The topics to be addressed in each of these areas are outlined in this program description.

7.4.1 Fundamentals of Training

The fundamentals training is to be conducted at the beginning of the program. This phase of the program is to provide the candidate with the knowledge necessary to effectively operate those systems involved in fuel handling support as well as provide the candidate with a knowledge of plant operating fundamentals.

The topics to be addressed during the fundamentals training are listed below:

1. Power Plant Fundamentals

The purpose of the training in power plant fundamentals is to provide the candidate with a knowledge of the operating principles of mechanical, electrical and chemical systems, and reactor core characteristics as they relate to defueling.

Training on fundamentals for systems not installed at the time of the initial class is to be included in the Fuel Handling Systems Training phase of the program. The scope of the power plant fundamentals

training is to be determined by the Supervisor, Licensed Operator Training and approved by the Operator Training Manager. The topics to be covered are listed below.

Reactor Physics - emphasize subcritical operations
Mechanical Fundamentals
Electrical Fundamentals
Criticality Safety
Radiological Controls
Core Accountability

2. Power Plant Systems

The purpose of the Power Plant Systems training is to provide the candidate with a knowledge of the long term systems installed at TMI-2 which may not be modified during defueling systems installation.

Systems to be included in training are those which can affect the defueling operation. The scope of this training is determined by the Supervisor, Licensed Operator Training and approved by the Operator Training Manager and Manager, Plant Operations. The topics to be covered are listed below:

Core Construction
Core Cooling Systems

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Electrical Distribution Systems for Defueling
Ventilation Systems - Reactor and Fuel Handling Bldg
Core Monitoring Systems - Nuclear and Non-Nuclear
Fire Protection Systems
Liquid Waste Handling Systems
Communications Systems
Technical Specifications

3. Plant Procedures

The purpose of training in plant procedures is to provide the candidate with a knowledge of administrative, operating and emergency procedures which are applicable to the installed defueling systems at the time of training. Additional training may be required to incorporate the scope of changes effected by the installation of the defueling systems. The scope of this training is determined by the Supervisor, Licensed Operator Training and approved by the Operator Training Manager and Manager, Plant Operations. The topics to be covered should include:

Emergency Procedures
Radiological Controls Procedures
Administrative Procedures

4. General Categories

The purpose of this training is to provide the candidate with training in areas not addressed elsewhere. Training conducted in this area should be developed from the following list of topics:

Facility Incidents and Industrial Experience

Code of Federal Regulations

7.4.2 On-The-Job Training

The purpose of the on-the-job training (OJT) program is to provide the candidate with the practical knowledge necessary to perform licensed duties. The OJT program is to include practical training in procedures as well as systems. The OJT program for plant systems and procedures is detailed in Appendix A. The scope of the OJT program is determined by the Supervisor, Licensed Operator Training and approved by the Operator Training Manager and Manager, Plant Operations.

The OJT program is to be completed during periods while assigned as an extra person and during scheduled practical training. In addition, hands-on availability of equipment during vendor site visits and periods other than when assigned on shift may be used to complete OJT requirements.

7.4.3 Defueling Systems Training

The purpose of the Defueling Systems Training is to provide the candidate with a knowledge of the systems installed specifically to facilitate defueling operations. The scope of this training is to be determined by the Supervisor, Licensed Operator Training and approved by the Operator Training Manager and Manager, Plant Operations. This training is to include the following topic areas as they relate to defueling operations:

Electrical Distribution

Defueling Systems

Communications Systems

Technical Specifications

Administrative Procedures

Abnormal, Normal and Emergency Operating Procedures

7.4.4 Simulation Training

7.4.4.1 Simulations training should be conducted to reinforce skills and knowledge requirements identified for FHSROs. This training should emphasize the practical application of equipment operations and provide demonstration of basic principles.

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7.4.4.2 Where practical, the Defueling Test Assembly or similar training mockups should be used to provide simulation training on defueling equipment operation. This training may be used to satisfy requirements established in the OJT program for both replacement and requalification programs.

7.4.4.3 A research reactor or simulator training device should be used to conduct training to emphasize theoretical fundamentals and operational characteristics.

7.5 Administration

7.5.1 Program Presentation

7.5.1.1 On-The-Job Training

- a. The on-the-job training program consists of preselected tasks which involve participation by the Fuel Handling Senior Reactor Operator (FH SRO) candidate in activities designed to train the candidate to perform assigned duties.
- b. Primary verification of OJT tasks shall be by oral checkout of the FHSRO candidate on individual task items by a task examiner. The task examiner shall be RO or SRO licensed or subject matter experts as designated by the Manager, Plant Operations.

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- c. Final verification of OJT tasks shall be by oral checkout of task sheet sections by a licensed SRO or subject matter experts as designated by the Manager, Plant Operations.
- d. OJT tasks specifically related to defueling equipment may be provided in additional appendixes as equipment is delivered and training developed. Interim changes to the OJT program should be implemented using the Addition/Deletion letter format in Appendix D. Changes initiated using this method shall be incorporated into the program description during the annual program review.
- e. During the OJT phase the candidates may be assigned to various shifts.

2. Classroom Training

- a. The classroom training is conducted with material presented by qualified instructors using approved lesson plans. All portions of classroom training requiring self-study shall be monitored by a qualified instructor who shall be available for individual consultation.

- b. The candidate will be responsible for objectives designated for FHSROs on material presented. If a candidate misses more than one (1) consecutive week, the Supervisor, Licensed Operator Training will review the situation and determine if the candidate will be able to catch up with his class, and make a recommendation to the Operator Training Manager and the Manager, Plant Operations regarding continuation in the program.

7.5.2 Evaluation Criteria

7.5.2 1. On-The-Job Training

- a. Comprehensive oral checkouts shall be administered by the task examiners for specific task sign-offs and documented by the task examiner's signature.
- b. The ultimate responsibility for determining adequate achievement by the student rests with the Final Verification Examiner who shall evaluate the performance of the FH SRO candidate by final oral checkout and/or written questioning of each OJT section, using the Oral Examination Summary Sheet in Appendix B. This form shall be retained in the candidate's permanent training file.

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c. All tasks which cannot be performed are to be simulated. Performance or simulation of a task shall not alone constitute successful completion of the task. Discussion and oral questioning by the task examiners and final verification examiners should be utilized to substantiate successful completion of the task.

d. Individuals failing to achieve a "pass" grade on "Final Verification" checkouts shall be:

- (1) Informed of their weak areas and given direction on the material that they should study to upgrade their performance.
- (2) Re-examined within two (2) weeks of the initial failure.

NOTE: Details of weak areas should be forwarded to the Supervisor, Licensed Operator Training.

If an individual fails the second final verification check-out the Manager, Plant Operations and the Operator Training Manager shall review the FH SRO license candidate's overall progress and performance and determine the corrective action to be taken.

7.5.2 2. Written Examinations

Written examinations during classroom training shall be administered by the Operator Training Section on a weekly basis. Questions should cover the lesson objectives presented in the classroom training session.

A passing grade of 80% is mandatory for all written examinations. A grade of less than 80% will require candidate counseling by the instructor responsible for (noted weak area(s)) on the candidate's exam with suggested corrective actions that will upgrade the individual's performance. A re-exam should be administered within two (2) weeks. If an individual fails the second exam, the Manager, Plant Operations and the Operator Training Manager shall evaluate the FH SRO license candidate's performance and decide on the corrective action to be taken.

7.5.2 3. Final Examination

- a. A comprehensive written and oral examination shall be administered at the conclusion of the training program.
- b. An 80% overall average and a 70% on individual sections is required for the satisfactory completion of the written examination phase.

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- c. The oral examination should consist of two phases; a "walk through" phase, administered by an individual designated by the Supervisor, Licensed Operator Training, and a "board" composed of instructors designated by the Supervisor, Licensed Operator Training, and the Manager, Plant Operations or his designated representative. A "pass" grade is required for the oral examination. Documentation shall be completed using the Oral Examination Summary Sheet in Appendix B.
- d. Upon completion of these exams, the FH SRO License Candidate's training files and Training Department recommendations shall be forwarded to the Director-TMI-2, who may certify the candidate for NRC examination.

7.6 Changes and Lesson Plan Correction

7.6.1 The program shall be maintained to reflect the following:

- a. Changes in regulatory requirements
- b. Changes in applicable codes, standards and guides
- c. Significant experiences at the facility
- d. Significant experience throughout the industry
- e. Remedial changes recommended by review/audit findings

- f. Regularly scheduled participant critiques
 - g. Changes in position responsibilities
- Changes will be incorporated per the applicable Training Department Procedure

7.6.2 Changes in the program content may be necessitated on an individual basis due to unplanned equipment failure or problems, operational commitments, procedural changes or deletions, or candidate qualification and professional knowledge.

7.6.2.1 The request for deletion(s) of any requirements from this program shall be submitted by the Supervisor, Licensed Operator Training with acknowledgement from the license candidate. Approval of the requested deletions shall be made by the Operator Training Manager and Manager, Plant Operations, and Manager, Plant Training. When approved, the deletion letter shall be kept in the Training Department files.

7.6.2.2 Deletions due to equipment problems or plant operational commitments shall only be approved for situations where plant conditions cannot be established within a reasonable amount of time before required certification. In no case should

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deletions be authorized during a qualification program when required conditions are expected prior to certification.

7.6.2.3 When deletions are requested due to prior candidate experience, an assessment of the candidate's knowledge and previous operating experience and qualifications shall be made by the Supervisor, Licensed Operator Training. By signing the deletion letter, the Supervisor, Licensed Operator Training is verifying knowledge level and operating experience through oral or written examination and/or personal review of candidates records.

7.6.2.4 Any deletions to this program shall be made by the use of the Deletion Letter format in Appendix "D".

7.6.3 Changes in the OJT Appendices to this program are authorized when changes in plant status or procedures mandate a change in the program. At the completion of each class, the OJT program should be evaluated and required program changes issued. Interim changes may be issued with approval from the Manager, Plant Operations and Manager, Plant Training using the format provided in

Appendix D. Any interim changes issued shall be incorporated into the annual program description change.

7.7 Program Scheduling

The program will be scheduled as required to support plant operations.

7.8 Records and Reports

1. A Training Program Administrative form shall be completed and submitted to the Administrative Section for each classroom lecture or lesson.
2. Current and past schedules, lesson plans, student handouts, completed OJT task sheets, exam keys and completed exams and quizzes, both written and oral, as well as any additional pertinent qualification records shall be maintained in accordance with Training Department procedures.

7.9 Evaluation

- 7.9.1. At the conclusion of each phase of training, the license candidates will be asked to complete a training critique form to assist in program evaluation. Guidelines provided in 6200-ADM-2682.12 Course Evaluation Process, may be used in conducting course evaluations. The completed critiques shall be reviewed by the Supervisor, Licensed Operator

Training and forwarded, along with recommendations or corrective action taken to the Operator Training Manager.

7.9.2. At the completion of each training program, an internal team will be formed by the Supervisor, Licensed Operator Training to review the Fuel Handling SRO Training Program. The review team will consist of instructors from the Operator Training Section and personnel from the Operations Department. The team will assess the adequacy of the program for:

Meeting established requirements and responding to identified

Adequacy of records

Quality of material and presentations

Effectiveness

7.9.2.1 In conducting the review, the team may use any records maintained by the Training or Operations Departments to assist them. These may include:

NRC Inspections

QA Audits

Other Audits

Regulatory Changes

Industry Experience

Candidate Critiques

7.9.2.2 The review team shall report the results to the Manager, Plant Training and the Manager, Plant Operations via the Supervisor, Licensed Operator Training and the Operator Training Manager.

7.9.2.3 Guidelines established in 6200-ADM-2682.03 Technical Content Review and Interface Process should be used in conducting the annual evaluation.

8.0 FUEL HANDLING SRO REQUALIFICATION TRAINING

8.1 Objectives

8.1.1 The objectives of the requalification program are to:

- a. Maintain systems operationally safe and reliable.
- b. Assure that licensed personnel maintain the high level of skill and knowledge required to accomplish routine and emergency duties.
- c. Establish a system for evaluating and documenting licensed personnel proficiency and competency.

8.2 Program Description

8.2.1 The operator requalification program shall include pre-planned training sessions conducted on a regular and continuing basis, Skills Training and Evaluation and an annual examination.

8.2.2 Scheduling of the requalification program shall be determined by the Supervisor, Licensed Operator Training and approved by Operator Training Manager. The following areas as they relate to defueling operations, should be considered by the Supervisor, Licensed Operator Training:

1. Review of Defueling Systems
2. Initial training on new defueling systems
3. Modifications to installed additional defueling systems
4. License Events Reports and Industrial Experience Reviews
5. OJT to support new systems
6. Normal, Abnormal, Emergency Operating Procedures, and associated procedural changes
7. Review of Fundamentals training
8. Changes to job accountabilities
9. Technical Specifications

8.3 Pre-Planned Lecture Series Schedule

8.3.1 The pre-planned lecture series shall be scheduled on an annual basis.

8.3.1.1 Lectures may be deferred due to unanticipated events but should be conducted as soon as practicable thereafter and within the annual cycle.

8.3.1.2 Topics for the FH SRO requalification program may, when practical, be integrated into the Licensed Operator Requalification Program.

8.3.2 Pre-Planned Lecture Series Topic

The requalification program shall include preplanned training sessions conducted on a regular and continuing basis. The training session shall include lecture series on fundamentals review and operational proficiency.

8.3.2.1 The fundamentals review lecture series topics are selected on an as needed basis and shall as a minimum include the following over the period of the license:

- a) Theory and Principles of Fuel Criticality
- b) Heat Transfer, Fluid Flow, and Thermodynamics
- c) Defueling Instrumentation and Control Systems
- d) General and specific Defueling Systems operating characteristics
- e) Defueling Systems Protection Systems
- f) Normal, Abnormal, and Emergency Operating Procedures
- g) Radiation Control and Safety
- h) Plant Support Systems associated with defueling

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i) Applicable portions of Title 10, Chapter I,
Code of Federal Regulations

These topics presented should reflect the results of the annual examinations and performance of the FHSRO as evaluated by the Manager, Plant Operations and Site Operations Director

The topics shall be presented on a biennial basis. The scope of the lecture series should be determined by the Supervisor Licensed Operator Training and approved by the Operator Training Manager.

8.3.2.2 The operational proficiency lecture series shall cover areas which involve essential defueling operational requirements. The topics for this series are selected to ensure operational changes and experiences are integrated into the training program schedule. The lecture topics should include the following as they relate to defueling operations:

- a) Normal, Abnormal and Emergency Operating Procedures.
- b) Technical Specifications
- c) Administrative Procedures, Conditions and Limitations

- d) Major operational evolutions
- e) Related Nuclear Industry Operating Experiences
- f) Operating History and Problems

The scope of the lecture series should be determined by the Supervisor, Licensed Operator Training and approved by the Operator Training Manager. Information on the topics may also be covered in other than classroom training such as staff discussion sessions.

8.3.3 Pre-Planned Lecture Series Attendance

8.3.3.1 Attendance of all licensed personnel shall be recorded.

8.3.3.2 Absences for an individual exceeding more than one week of scheduled training for a qualification year shall be approved by the Manager, Plant Operations or the Site Operations Director. In any case the individual who misses the training shall be responsible for the material presented in his absence and shall take the quiz that was given on the missed material.

8.3.3.3 Any mandatory attendance requirements shall be determined by the Supervisor, Licensed Operator

Training and approved by the Manager, Plant
Operations and Operator Training Manager.

8.3.4 Pre-Planned Lecture Series Training

8.3.4.1 The pre-planned lecture series shall use training sessions supported by lesson plans prepared and approved in accordance with Training Department procedures.

8.3.4.2 Instructors presenting lectures shall be qualified in accordance with Training Department procedures. Guest lecturers need not be qualified but shall be approved by the Operator Training Manager or the Manager, Plant Training, in writing.

8.3.5 Pre-Planned Lecture Series Evaluation

The lecture series shall be evaluated by conducting evaluations of the trainees knowledge, effectiveness of the overall lecture series, and the effectiveness of the instructors.

8.3.5.1 After each week of lectures, all trainees shall take a written, closed book quiz covering the lecture topic(s). This evaluation shall contain

questions related to the lesson plan objectives covered during the lectures. Quizzes shall be evaluated and grade determined for each trainee.

A performance standard of 80% shall be established for the written quizzes. Trainees who do not meet these performance standards should complete a remedial review progress within seven weeks consisting of:

- 1) Trainee review of the training session material associated with identified knowledge deficiencies.
- 2) Trainee review of associated reference material identified by the Training Department.
- 3) Administration of a second quiz covering at least the identified knowledge deficiencies.

If the second quiz is completed satisfactorily, the trainee should receive credit for completion of the required lecture. If the second quiz is unsatisfactory, the Supervisor, Licensed Operator Training shall notify the Operator Training Manager of the results and the Operator Training Section shall provide a recommendation regarding

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the trainee's removal from licensed duties and entrance into an accelerated requalification program.

8.3.5.2 An overall evaluation of the annual lecture series should be conducted on an annual basis in accordance with Training Department Procedures

8.3.5.3 Instructor evaluations shall be conducted in accordance with Training Department procedures.

8.3.6 Skills Training and Evaluation

In order to maintain an acceptable level of skills and familiarity associated with defueling system, controls and operational procedures, each FHSRO shall participate in frequent and varied plant evolutions. Each FHSRO shall demonstrate operational proficiency by participating in Reactivity Manipulations and Plant Evolutions.

To maintain these skills, licensed operators shall actually manipulate or actively supervise manipulation of the controls.

8.3.6.1 Reactivity Manipulation and Plant Evolutions

During the two year term of the NRC license each FHSRO shall participate in a variety of

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reactivity control manipulations and plant evolutions. Due to the unique status of Three Mile Island Unit 2, in lieu of control manipulations prescribed by the March 29, 1980, NRC Directive as satisfying the requirements of 10CFR55 Appendix A, the following list of appropriate manipulations shall be supervised by the licensed operators at Three Mile Island Unit Two. These manipulations shall include the following over the period of the license:

1. Loading of fuel canister with fuel/core debris.
2. Transfer of canister from reactor vessel to storage outside the vessel.
3. Transfer of canister to storage racks in the fuel handling building.

The manipulations are designed to emphasize the necessity for a focused awareness of the unique conditions and potential operations which are peculiar to the TMI-2 status.

A total of ten manipulations shall occur over the period of the license, with a minimum of one per category per year. Documentation of these manipulations shall be completed using Appendix E.

8.3.6.2 Abnormal/Emergency Defueling Evolutions

On an annual basis each licensed individual shall participate in training exercises covering defueling abnormal/emergency conditions during a drill program which includes the following evolutions:

- 1) Fuel Transfer Abnormal Operations
- 2) Dropped Canister
- 3) Situations Requiring Reactor Building Evacuation
- 4) Radiological Accident

Individual and operational team performance during the abnormal/emergency training exercises shall be monitored and deficiencies corrected so that satisfactory proficiency is demonstrated. Participation in a plant drill involves either responding to drill conditions or being assigned monitor for observing/evaluating response to a drill. Plant drills may be conducted with the approval of the Manager, Plant Operations and shall meet the requirements established in 6212-ADM-2611.02, Licensed Operator Requalification Program Description, TMI-2.

8.3.6.3 Skills Evaluation System

Licensed personnel performance and competency related to performing licensed duties shall be periodically evaluated. Their performance evaluation established in procedure 6200-ADM-2682.10 "Trainee Evaluation Once Back on The Job", may be used to evaluate licensed operator performance. Repeated errors or other indicators of degraded proficiency should be reviewed by the Manager, Plant Operations and the Operator Training Manager and appropriate training initiated.

8.3.6.4 Skills Training Participation

- a. In the event that skills training guidelines for participation in reactivity manipulations (8.3.6.1) and Abnormal/Emergency Defueling Evolutions (8.3.6.2) are not met within the required time period, they should be scheduled and completed within fourteen (14) weeks of the required period.

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- b. In addition to meeting the requirements for participation noted above, each licensed FHSRO shall actively participate in defueling operations a minimum of one shift per month. During this period, the licensed personnel shall actively perform licensed operator duties. Based on schedule constraints, satisfactory performance shall be defined as meeting the requirements on a quarterly basis. Failure to meet the proficiency requirement shall result in the licensed operator being placed in an Inactive Status Retraining Program.
- c. Documentation of watchstanding shall be completed using Appendix E.

8.3.7 Skills Training Participation

The operational review program is a system for on-shift review of selected operational experiences and changes to existing operating guidance or equipment. The operational review program enables continuous updating of on-shift personnel and establishes a means of disseminating new or changing information on a short term basis.

8.3.7.1 Modification Review

- a. A continuing system shall be established by the Manager, Plant Operations such that licensed individuals review documented defueling equipment changes, equipment modifications, procedure changes and technical specification changes. Selected changes and modifications should be analyzed and information pertinent to the basis for the changes in their operational implications collected.
- b. Changes to emergency procedures, technical specifications and safety related systems shall be reviewed prior to the licensee assuming shift operation responsibilities.
- c. The Manager, Plant Operations and the Supervisor, Licensed Operator Training should specify changes and modifications to be analyzed, with information for review transmitted in accordance with the urgency of the situation. The Manager, Plant Operations should ensure that all on-shift licensed personnel review the selected information in a timely manner.

- d. Expanded coverage of plant design changes, equipment modifications, procedure changes and technical specification changes in the Operation Proficiency Lecture Series should be considered by the Supervisor, Licensed Operator Training.
- e. On-shift supervisory (FHSRO or SRO) personnel should provide guidance to on-shift operators in interpreting and reviewing changes and modifications. An on-shift discussion period to review changes and modifications is encouraged.
- f. This review shall be documented with a formal transmittal to all licensed individuals with acknowledgement of review required.

8.3.7.2 Operating Experience Review

- a. A continuing system shall be established by the Manager, Plant Operations such that licensed individuals review operating experience from TMI and applicable segments of the nuclear industry. Selected operational events and reportable

occurrences at the facility should be analyzed and information pertinent to the event collected. Selected operational information from the nuclear industry should be analyzed. The following sources of information should be considered:

- 1) Licensee Event Reports
- 2) Audit, evaluation, and inspection reports
- 3) Publications and periodicals covering nuclear industry information.
- 4) NSRC/TNPO Significant Event Reports

- b. The Manager, Plant Operations should ensure that all on-shift licensed personnel review the information in a timely manner.
- c. Subsequent coverage of operating experience in the Operation Proficiency Lecture Series should be considered by the Supervisor, Licensed Operator Training.
- d. This information should be formally transmitted to all licensed individuals with required acknowledgement of review.

8.4 Annual Requalification Examination

In order to determine each licensed individual's knowledge of topics covered in the requalification program and provide a basis for determining areas in which retraining is needed, an annual requalification examination shall be given. The annual examination shall be given to all licensed individuals prior to the completion of each annual requalification program cycle and shall consist of an oral examination and a written examination.

8.4.1 Annual Written Examination

An annual written examination shall be administered to all licensed individuals. The written examination shall contain examination questions covering the following topics as they relate to defueling:

- 1) Theory and Principles of Fuel Criticality
- 2) Heat Transfer, Fluid Flow and Thermodynamics
- 3) Features of Defueling Facilities Design
- 4) Defueling Systems Operating Characteristics
- 5) Defueling Systems Instrumentation and Control Systems
- 6) Defueling Protection Systems
- 7) Radiation Control and Safety
- 8) Applicable Portions of Title 10, Chapter I, Code of Federal Regulations
- 9) Normal/Abnormal and Emergency Operating Procedures

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- 10) Technical Specifications
- 11) Defueling Administrative Procedures, Conditions and Limitations
- 12) Nuclear Industry Operating Experience

The topics should be grouped categories similar to the NRC licensing examination for evaluation purposes.

8.4.1.1 Written Examination Administration

The written examination should be prepared under a structure enabling consistency of questioning and minimizing possible compromise of examinations prior to administration. The examination construction and security shall be in accordance with Training Department Procedures.

8.4.1.2 Written Examination Performance Standards

A licensed individual receiving a grade of less than 70% in any examination category and an overall grade of less than 80% shall be relieved of his license duties and placed in an accelerated qualification program.

Under special circumstances where a grade of less than 70% has been scored in a single section, the

Director, TMI-2 may document the special circumstances and authorize an oral and written reexamination of the failed section within one (1) week. If the oral exam is completed satisfactorily and a grade of 80% or greater is scored on the written section, the individual may return to shift in a licensed status with the approval of the Director, TMI-2.

8.4.2 Annual Oral Examination

An annual oral examination shall be administered to all licensed individuals.

8.4.2.1 Oral Examination Content

- a. The oral examination should contain questions covering the following areas as they relate to defueling:
- 1) Licensed duties and responsibilities of the operating position corresponding to the individual's license level.
 - 2) Actions in the event of abnormal conditions.
 - 3) Actions in the event of emergency conditions.

- 4) Interpretation of instrumentation responses.
- 5) Defueling System transients and accident response.
- 6) Defueling System modifications.
- 7) Procedure changes.
- 8) Technical Specifications.
- 9) Emergency Plan.
- 10) Defueling Operating history and problems.
- 11) Related nuclear industry defueling operating experiences.

8.4.2.2 0 Examination Administration

- a. The oral examination shall be conducted under a structure enabling consistency of questioning and evaluation. The following guidelines should be considered.
 - 1) A checklist identifying the areas to be covered shall be used.
 - 2) Overall evaluation shall be made on a pass/fail basis.
 - 3) Comments on individual strengths and weaknesses shall be made.

- b. The Supervisor, Licensed Operator Training and the Manager, Plant Operations shall establish the oral examination schedule.
- c. Personnel assigned to conduct an oral evaluation shall be designated by the Supervisor, Licensed Operator Training and approved by the Manager, Plant Operations. Oral examinations shall be conducted by a Licensed Senior Operator or personnel designated by the Manager, Plant Operations and the Site Operations Director.

8.4.2.3 Oral Examination Performance Standards

A failing overall oral examination grade shall require the licensed individual to be removed from his license duties and placed in an accelerated requalification program.

8.5 Special Retraining Programs

Specific retraining programs for licensed individuals may be required to upgrade or refresh knowledge and skills related to licensed duties.

8.5.1 Accelerated Requalification Program

The accelerated requalification program is for licensed individuals having identified deficiencies requiring assignment to a special retraining effort.

8.5.1.1 Required Attendance

Licensed individuals meeting one or more of the following criteria shall be assigned to an accelerated requalification program:

- 1) Annual requalification written examination performance deficiencies.
- 2) Annual requalification oral examination performance deficiencies.
- 3) Pre-planned lecture series quiz performance deficiencies.
- 4) Significant licensed duty performance deficiencies identified by the Manager, Plant Operations and/or the Supervisor, Licensed Operator Training.

8.5.1.2 Program Content

The accelerated requalification program content shall be specifically structured to upgrade knowledge and skills identified as deficient. Examination categories and areas in which

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performance standards were not met shall be covered in the program. The Supervisor, Licensed Operator Training, shall be responsible for formulating individual accelerated requalification programs. They shall be approved by the Operator Training Manager, and Manager, Plant Operations.

8.5.1.3 Program Administration

The accelerated requalification program may involve a variety of training exercises including:

- 1) Directed self-study.
- 2) Oral interviews and discussion sessions.
- 3) Pre-planned lectures.
- 4) Skills training exercises at the plant.

Program duration should be dictated by the extent of training required and the trainee's performance.

8.5.1.4 Performance Standards

- a. Successful completion of the accelerated requalification program shall be determined by administering an examination. The examination shall cover all categories of

the requalification written examination and/or all areas of the requalification oral examination originally failed.

b. The examination format should be similar to the original examination, and the examination shall be conducted by individuals designated by the Supervisor, Licensed Operator Training.

c. Performance standards for the accelerated requalification program shall be as follows:

- 1) A score of at least 80% on each accelerated requalification written examination category.
- 2) A passing evaluation on the accelerated requalification oral examination.

d. In the event that these standards are not met, the individual's suitability for resuming licensed duties will be reviewed by the Supervisor, Licensed Operator Training. He shall provide a recommendation to plant management and the Director MI-2, via the Operator Training Manager and Manager, Plant Training regarding the individual's permanent removal from licensed duties or

additional upgrading efforts to be considered. If appropriate, another accelerated requalification program shall be structured to correct deficiencies.

8.5.2 Inactive Status Retraining

8.5.2.1 If a licensed individual has not actively carried out licensed duties for a period in excess of four (4) months, a special retraining program and/or evaluation is required prior to resuming licensed duties.

- a. Active status can be maintained by performance of licensed duties and participation in the requalification program. Performance of licensed duties for a FHSRO involves the manipulation or supervision of the manipulation of controls which may effect the reactivity of fuel at the facility, and for those individuals not normally assigned to an operating shift, completing the requirements for participation in defueling operations.
- b. In the event that a licensed individual does not maintain an active status, the

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Supervisor, Licensed Operator Training shall designate, subject to approval of the Manager, Plant Operations and Operator Training Manager, a Licensed Senior Operator or subject matter expert to conduct an oral examination similar to scope and format to an annual oral examination prior to resuming licensed duties. In addition, evaluation of performance in the current Pre-planned Lecture Series shall be conducted. If performance in the Pre-Planned Lecture Series is unsatisfactory, a written examination similar in scope and format to the annual written examination shall be administered to the licensed individual prior to resuming licensed duties.

- c. Consideration should be given by the Manager, Plant Operations to assigning the licensed individual to a training status on a defueling shift prior to resuming licensed duties.
- d. The performance standards applied to the annual requalification examination shall be used in evaluating the results of the oral

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and written examinations. If the performance standards are not met, the licensed individual shall complete an accelerated requalification program prior to resuming licensed duties.

- e. In cases where the licensed operator has not performed licensed duties for a period of greater than four (4) months, licensed duties may be resumed only upon certification of the Director TMI-2, which must be forwarded to the NRC.

8.5.3 Requalification Training for Newly Licensed Individuals

8.5.3.1 Newly licensed individuals shall enter the requalification program and participate in the annual program cycle upon receipt of their license.

8.5.3.2 Newly licensed individuals successfully completing their NRC licensing examination less than three (3) months prior to an annual requalification examination may be excused from taking the current annual written and oral examinations.

8.6 On the Job Training

8.6.1 The OJT program shall consist of tasks selected by the Supervisor, Licensed Operator Training and approved by the Operator Training Manager and the Manager, Plant Operations. These tasks will be chosen to reinforce new systems training or any problem areas identified by the Manager, Plant Operations.

8.6.2 The OJT program developed as part of the requalification will be designed to supplement those task lists issued under the replacement program.

8.6.3 Due to the changing conditions of the plant it will be necessary to develop new task lists for the licensed operators. These task lists and the associated training program coverage will be developed in accordance with the Training Department Procedures.

8.6.4 During the annual review of the training program the tasks identified for inclusion in the requalification shall be incorporated into the replacement program description.

8.6.5 Primary verification of OJT tasks shall be done in accordance with guidelines established in the initial program.

8.7 Licensed Operator Certification

8.7.1 Due to the sequencing of defueling operations the training program for fuel handling senior reactor operators will require that some phases of defueling after the initial defueling be covered in the requalification program. As a result, the tasks for which the operators were initially trained will be supplemented in order to ensure that each operator is adequately trained to accomplish defueling operations scheduled after completion of the initial replacement program.

8.7.2 The completion of any assigned OJT programs and satisfactory completion of examinations encompassing identified tasks will constitute certification of the operator to safely and competently perform defueling operations.

8.8 Requalification Program Records

Records of FH SRO's performance in the requalification program shall be maintained in an auditable manner. These records shall be maintained in accordance with Training Department procedures.

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APPENDIX A

ON-THE-JOB TRAINING CHECKLIST

On these sheets are lists of Administrative Emergency, Abnormal, Operational and Surveillance procedures which must be read, discussed and walked through.

Approximately fifteen (15) of these procedures must be addressed each week to maintain an adequate rate of progression through all of the items listed.

NOTE: Unit 2 procedures are undergoing format and number change. Procedures indicated may be under different numbers, check with Control Room if any problem with obtaining a procedure occurs.

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	DATE	TASK EXAMINER
1.0 For the following Administrative Procedures each candidate should: A. Read the procedure. B. Be able to identify and implement the procedure which best suits a given situation. (i.e., use the procedure to correctly respond to a situation posed by the examiner) C. Describe your responsibilities pertaining to the procedure.		
1.01 4000-ADM-1000.01 and 4210-ADM-1000.01 TMI-2 Organization		
1.02 4000-ADM-1000.02 Organizational Stop Work/Shutdown Responsibility and Authority		
1.03 4000-ADM-1218.01 and 4210-ADM-1218.01 Procedure Numbering Format, Content Implementation and Compliance and Operating Procedures		
1.04 4000-ADM-1218.02 Procedure and UWI Review		
1.05 4000-ADM-1218.03 Procedure Change and Review		
1.06 4000-ADM-1218.04 TMI-2 Document Control and Distribution		
1.07 4000-ADM-1218.08 Procedure Periodic Review		
1.08 4000-ADM-3000.1 TMI-2 Unit Work Instruction		
1.09 4000-ADM-3020.04 & 4000-ADM-3020.05 Tagging		
1.10 4000-ADM-1100.01 Confined Spaces		
1.11 4000-ADM-3020.06 Unit Facilities Status Tagging		

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	DATE	TASK EXAMINER
1.12 4210-ADM-3020.03 & 4210-ADM-3020.04 Shift Relief and Log Entries		
1.13 1033 Operating Memos and Standing Orders		
1.14 4000-ADM-3061 Recovery Operations Plan Surveillance Test Program		
1.15 9200-ADM-1201.02 Radiological Awareness Reporting		
1.16 4015 - Admin. and Emergency Exposure and Contamination Limits		
1.17 4046 Radiological Review Procedure		
1.18 4000-ADM-2600.01 Job Briefings and Mock Up Training		
1.19 4000-ADM-1500.02 Safeguards Information		

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Read and be familiar with the FHSRO's Responsibilities of the following Administrative Procedures:		
1.20 9200-ADM-4110.07 Radiography Operations		
1.21 4210-ADM-3020.01 Conduct of Operations		
1.22 4000-ADM-3030.02 & 4000-ADM-3030.03 Good Housekeeping		
1.23 4200-ADM-7350.01 Modification Controls		
1.24 T.S. 6.2.2. & 2202-3.1 Shift Manning Requirements		
1.25 4150 Rad Material Transfer Accountability		
1.26 4140 Radioactive Liquid Spills		
1.27 RWP's 9200-ADM-4110.04		
1.28 4041 ALARA Program		
1.29 4000-ADM-1102.02 Scaffold Inspections		

Section 1.0

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	DATE	TASK EXAMINER
2.0 Under the direction of the Operator at the Controls perform the following		
2.01 Observe/qualify switching and tagging operations per 4000-ADM-3020 and 4000-ADM-3020.05		

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3.0 For the areas listed below be able to complete the objectives identified for each:		
A. Describe the various types of fire detection systems, state their setpoints & Tech Specs.		
B. Describe the effects of automatic actuation sequence of the following:		
1. Deluge System		
2. Fire detection system in the area		
3.01 Coordination Center (A & B)		
3.02 Reactor Building (A & B)		
3.03 Auxiliary & Fuel Handling Building (A, B)		

Sections 2.0 and 3.0

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4.0 For the following System Operating Procedures in sections 4.0 and 5.0 the candidate should be able to: A. Trace flow paths B. Locate major components C. Locate instrumentation and controls D. Discuss the following 1. Limits and precautions 2. Automatic response/interlocks/setpoints 3. Indications for monitoring operations		
4.01 Reactor Building Normal & Emergency Ventilation and Cooling 2104-5.1		
4.02 Fuel Handling Building H & V 2104-5.2		
4.03 R.B. Purge using the Modified Purge System 2104-4.91		
4.04 Temporary Containment Service Air System 4370-IMP-3851.01		

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	DATE	TASK EXAMINER
5.0 Reactor Coolant System		
5.01 Reactor Coolant System Operation with core cooling via natural losses 2104-10.2		

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	DATE	TASK EXAMINER
6.0 Core Construction A. View the Quick Look 1 & 2 video tapes and the Core Topography Videotape (Candidate signature only required in the task examiner column)		
6.1 Internals Indexing Fixture Level Control and Cleanup A. Explain/discuss the operation of the Internal Indexing Fixture Level Control and Cleanup System		

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Sections 4.0, 5.0 and 6.0

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7.0 For the following Emergency & Abnormal Procedures, the candidate should be able to complete the following objectives as they apply to defueling operation: 1. Describe the conditions that require entry into the procedures. 2. State the procedure objective(s). 3. Explain the bases for notes and precautions. 4. Explain the consequences of not following the procedure.		
7.01 Station Blackout 4210-EAP-1300.02		
7.02 Blackout & Loss of Both Diesels 4210-EAP-1300.03		
7.03 Fire 4210-EAP-3680.01		
7.04 Unanticipated Criticality/Deborations 2202-1.2		
7.05 Excessive Radiation Levels 4210-EAP-4000.01		

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		DATE	TASK EXAMINER
7.06	Loss of Source Range Instrumentation 4210-EAP-3623.01		
7.07	Loss of RCS Level Indication 4210-EAP-3220.04		
7.08	Changes in RCS Water Level Beyond Normal Span 4210-EAP-3220.06		

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8.0	For the following Emergency & Abnormal Procedures, the candidate should be able to complete the following objectives as they apply to defueling operations: 1. State the procedure objective(s). 2. Explain the bases for notes and precautions. 3. Explain the consequences of not following the procedure.		
8.01	Hazardous Releases 2203-3.2		
8.02	High Reactor Building Pressure 4211-EAP-3240.01		

Section 7.0 and 8.0

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APPENDIX B

ORAL EXAMINATION SUMMARY SHEET:

CANDIDATE'S NAME _____

PURPOSE (CHECK ONE)

() OJT SECTION FINAL VERIFICATION

EXAMINER _____

() FINAL EXAMINATION

DATE _____

() OTHER

SUMMARY OF QUESTIONS ASKED

GRADE (PASS/FAIL)

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_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

WEAK AREAS NOTED:

OVERALL EVALUATION (PASS/FAIL)
FURTHER ACTIONS REQUIRED (IF NONE, SO STATE)

SIGNATURE OF EXAMINER _____

SUPERVISOR, LICENSED OPERATOR TRAINING _____

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APPENDIX C

DESIGNATION OF AS FINAL OJT EXAMINER

DATE: _____

TO: _____

You are hereby designated to serve as the final verification examiner for the OJT Sections noted below:

(LIST SECTIONS)

for Fuel Handling SRO's on Shift

~~(Letter)~~_____
Manager, Plant Operations

cc: Operator Training Section

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APPENDIX D

Addition/Deletion Letter to Fuel Handling Senior Reactor Operator Training Program

DATE: _____

SUBJECT: Addition/Deletion of Training Program Requirements for Fuel Handling Senior Reactor Operator

TO: Manager, Plant Operations
Operator Training Manager

Ref: (a) Applicable section of training program

In accordance with reference (a) it is requested that the following requirements be added/deleted from the Fuel Handling Senior Reactor Operator Replacement Training Program for _____

(CANDIDATES NAME)

ITEMREASON

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When approved, the candidate shall mark each affected item "Added/Deleted Per 6211-(Letter Number)." A copy of this letter shall be kept by the candidate and this letter filed in the candidates training record in the Training Department.

SUBMITTED: _____

CONCURRED: _____

APPROVED: _____

APPROVED: _____

Distribution: Candidate
Candidates Training Records
Manager Plant Operations
Operator Training Manager
Supervisor Licensed Operator Training

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APPENDIX E

FHSRO WATCHSTANDING/EVOLUTION DOCUMENTATION

This is to certify that _____ stood watch and performed licensed duties as a FHSRO on _____ on the (07-15) (15-23) (23-07) shift.

The following evolutions were supervised:

<u>Evolution</u>	<u>Qty</u>
Loading of fuel canister	_____
Transfer of canister from reactor vessel to storage outside the vessel.	_____
Transfer of canister to storage racks.	_____
Other	_____
_____	_____
_____	_____
_____	_____

Signature
Duty S.S./S.F.