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July 17, 1984 (202) 822-1215

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Sheldon J. Wolfe
Gustave A. Linenberger, Jr.
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

In the Matter of
Metropolitan Edison Company
(Three Mile Island Nuclear Station, Unit No. 1)
Docket No. 50-289 (Restart - Remand)

Dear Chairman Smith and Administrative Judges Wolfe and
Linenberger:

For the information of the Board and the parties, enclosed is a letter from Mr. Henry D. Hukill, Director, TMI-1, to Mr. Daryl G. Eisenhut, Director, Division of Licensing, NRC Office of Nuclear Reactor Regulation, forwarding a recent revision to the Three Mile Island Unit 1 Licensed Operator Requalification Training Program Description.

Sincerely,

Deborah B. Bauser

Deborah B. Bauser
Counsel for Licensee

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Enclosure
cc: Service List

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Commission

In the Matter of)

METROPOLITAN EDISON COMPANY)

(Three Mile Island Nuclear)
Station, Unit No. 1))

Docket No. 50-289

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Washington, D.C. 20555

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Administrative Judge
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Washington, D.C. 20555

Atomic Safety & Licensing Board
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July 2, 1984
5211-84-2162

Mr. Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington D.C. 20555

Dear Mr. Eisenhut:

Three Mile Island Nuclear Station Unit I (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
Licensed Operator Requalification Training Program Description

Attached is a revision to the Three Mile Island Unit I Licensed Operator Requalification Program Description, 6211-ADM-2600.01. This program was submitted to Region I Operator Licensing Branch on October 23, 1983, for review and comment.

This revision to the program description has been made to include the following:

1. Reformatting of program description to meet corporate procedure requirements.
2. Incorporate revisions to delete watchstanding requirements for certain licensed operators staff personnel involved in day to day operations of the plant. This deletion of watchstanding requirements is addressed in a Nuclear Regulatory Commission letter from Mr. Don Beckham to Mr. J. Varga dated September 17, 1982, on 10 CFR 55.33, Requirement to Actively Perform the Duties of an Operator or Senior Operator.
3. Incorporate Training for Basic Principles Trainer Simulator.
4. Revised classroom topics listing to include all topics outlined in 10 CFR 55 for requalification.

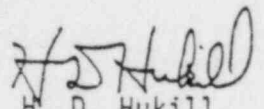
5211-84-2162

Mr. Darrell G. Eisenhut

-2-

Since this revision does not decrease the scope, time allotted for the program, or frequency in conducting different parts, it is effective immediately. This program is submitted for your review and comment. If there are any questions, please contact Mr. Bruce Leonard, Operator Training Manager, at 717-948-8046.

Sincerely,


H. D. Hukill,
Director, TMI-1

HDH/BPL/JGB/mle

Enclosure

Title

LICENSED OPERATOR REQUALIFICATION PROGRAM DESCRIPTION (UNIT 1)

Revision No.

1-00

Applicability/Scope

LICENSED OPERATORS

Responsible Office

TMI TRAINING DEPT.

This document is important to safety ☐ Yes ☒ No

Effective Date

06/12/84

List of Effective Pages

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16.0	1-00						
17.0	1-00						
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	Signature	Concurring Organizational Element	Date
Originator	<i>Frank J. Perry</i>	TECHNICAL PROGRAM SPEC.	5/27/84
Concurred by	<i>SR Frederick</i>	Supv. Licensed Op. Training	5/23/84
	<i>Ann Leonard</i>	Operator Training Manager	5-24-84
	<i>M.J. Ross</i>	MGR PLT OPS	6/1/84
Approved by	<i>M.J. Ross</i>	MGR PLT OPS	6/7/84
	<i>S. J. ...</i>	Manager, Plant Training	6/12/84

Title
LICENSED OPERATOR REQUALIFICATION
TRAINING PROGRAM DESCRIPTION (UNIT 1)Revision No.
1-00

TITLE: LICENSED OPERATOR REQUALIFICATION TRAINING PROGRAM DESCRIPTION UNIT 1

1.0 PURPOSE

The goal of the operator requalification program is to enhance nuclear plant safety and reliability by maintaining a high level of skill and knowledge in licensed senior operators and licensed operators. To achieve this goal, the operator requalification program is designed to be sufficiently broad in scope to review areas of knowledge necessary for safe plant operation and flexible enough to cover recent operating experience and operational changes so that proficiency can be enhanced and operational safety maintained.

The requalification program described in this document is implemented utilizing four interrelated segments. These segments are:

- 1) Pre-Planned Lecture Series
- 2) Skills Training and Evaluation
- 3) Operational Review Program
- 4) Annual Examination and Evaluation

Each program segment is described separately. The operator requalification program shall be conducted on a cyclic basis so that all program requirements are completed in a period not to exceed two years. Successive requalification programs shall be conducted on a schedule enabling a continuing program to exist.

The operator requalification program shall be established with fixed performance standards and specified remedial training requirements in the event of deficiencies occurring. The program training materials, performance results and records shall be maintained in a fully auditable manner.

Guidelines pertaining to duration of training in the requalification program are estimates of the time needed for retraining of licensed personnel. The training sessions needed to cover special nuclear plant operating situations or significant nuclear industry operating experiences may result in adjustments to these estimates. The duration of training shall also be adjusted as appropriate in order to assure that licensed personnel performance meets or exceeds established performance standards.

2.0 SCOPE/APPLICABILITY

This procedure applies to all Licensed Operators and Licensed Senior Operators.

3.0 DEFINITIONS

The definitions given below are of a restricted nature for the purpose of this program.

- 3.1 Drill - A supervised training exercise conducted 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.

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LICENSED OPERATOR REQUALIFICATION
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- 3.2 Contact Hour of Instruction - A one hour period in which the course instructor is present or immediately available for instructing or assisting students: lectures, seminars, discussions, problem solving sessions, and examinations are considered contact periods under this definition.
- 3.3 Licensed Operator (RO) - Any individual who possesses an operator's license pursuant to Title 10, Code of Federal Regulations, Part 55, "Operators' Licenses".
- 3.4 Licensed Senior Operator (SRO) - Any individual who possesses a senior operator's license pursuant to Title 10, Code of Federal Regulations, Part 55, "Operators' Licenses".
- 3.5 Annual - As referred to in the operator requalification program, is twelve (12) months, not to exceed 12 months plus 12 weeks, in order to accomodate plant operations. March 1, and subsequent anniversaries of this date, will be considered the starting date of each annual cycle of requalification program operation.
- 3.6 Shall, Should, and May - The word "shall" is used to denote a requirement; the word "should" to denote a recommendation; and the word "may" to denote permission - neither a requirement nor a recommendation.

4.0 RESPONSIBILITIES

- 4.1 Supervisor, Licensed Operator Training is responsible for:
- Determining the scope of the Fundamentals Review and Operational Proficiency Lecture Series.
 - Determining mandatory attendance requirements at requalification lectures based on weaknesses on previous annual requalification examination.
 - Designating those abnormal and emergency procedures to be the basis of the quiz questions for each six weeks' cycle such that all abnormal and emergency procedures are tested biennially.
 - Designating individuals to conduct overall evaluation of the annual lecture series and resolving problems described in these evaluations.
 - Resolving problems identified by evaluation of lecture series training sessions.
 - Preparing notification for plant and training management and the Director, TMI-1 of unsatisfactory performance as directed by this program.
 - Specifying changes and modifications to be analyzed for review in the operational review program.
 - Determining expanded coverage of plant design changes, equipment modifications, procedure changes, and technical specification changes in the Operational Proficiency Lecture Series.

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- f) Specifying, in conjunction with Technical Functions, operating experience to be analyzed for training purposes and integrating the information into the training program.
 - j) Designating personnel to prepare and grade the annual written examination, review the examination and answer key and review the graded examination for grading techniques and consistency.
 - k) Designating personnel to review and update the examination question file.
 - l) Establishing the annual oral examination schedule.
 - m) Designating personnel to conduct oral examinations.
 - n) Identifying significant licensee performance deficiencies requiring accelerated requalification programs.
 - o) Formulating individual accelerated requalification programs and designating individuals to conduct the associated examinations.
 - p) Preparing recommendations to plant and training management and the Director, TMI-1 regarding the permanent removal from licensed duties or additional upgrading efforts to be considered for those individuals failing to meet the standards of the accelerated requalification program.
 - q) Conducting an annual requalification program review and evaluation, submitting a report on this review, and taking immediate corrective action where necessary.
 - r) Establishing the requalification program records identified in Section 7.8.
 - s) Review of lesson plans for implementation of this program.
- 4.2 Operator Training Manager is responsible for:
- a) Approving the scope of the Fundamentals Review and Operational Proficiency Lecture series.
 - b) Approving scheduling and appearance of "Guest" lecturers.
 - c) Designating personnel to evaluate selected lecture series training sessions.
 - d) Reviewing repeated personnel errors or other indicators of degraded proficiency and initiating appropriate training.
 - e) Approving the annual written examination and answer key.
 - f) Approving accelerated requalification programs.
 - g) Approving lesson plans for implementation of this program.
- 4.3 Manager, Plant Training is responsible for:
- a) Designating personnel to evaluate selected lecture series training sessions.
 - b) Ensuring that the Training Department's Administrative Support Section maintains the records identified in Section 7.8.
 - c) Ensure that the training program is developed to meet the requirements established by the Director - TMI-I through the Manager, Plant Operations and that proper records and documentation are provided and maintained.

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LICENSED OPERATOR REQUALIFICATION
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- d) Approval of all changes to this program description.
- e) Certification of Basic Principles Trainer Instructors.
- 4.4 Manager, Plant Operations is responsible for:
 - a) Providing inputs to the Training Department on topics to be presented in the Fundamentals Review and Operational Proficiency Lecture Series.
 - b) Approving absences of licensed personnel from lecture series.
 - c) Approving Plant Drill Scenarios, the conduct of plant drills and additions or modifications to training programs as a result of drill critiques.
 - d) Reviewing repeated personnel errors or other indicators of degraded proficiency and initiating appropriate training.
 - e) Determining mandatory attendance requirements for preplanned lecture series attendance.
 - f) Establishing a continuing system so that licensed personnel review documented plant design changes, equipment modifications, procedure changes and technical specification changes, specifying the changes and modifications to be analyzed, and ensuring that on-shift licensed personnel review the selected information in a timely manner.
 - g) Establishing a continuing system so that licensed personnel review operating experience from TMI and applicable segments of the nuclear industry and ensuring that on-shift licensed personnel review the information in a timely manner.
 - h) Approving the annual written examination and answer key.
 - i) Establishing the annual oral examination schedule.
 - j) Approving personnel designated to conduct annual oral examinations.
 - k) Identifying significant licensee performance deficiencies requiring accelerated requalification programs.
 - l) Approving accelerated requalification programs.
 - m) Approving SRO's designated to conduct oral examinations for those individuals failing to maintain an active status.
 - n) Establishing and maintaining operational review series participation records.
 - o) Ensuring that the overall level of training of plant operators is satisfactory through the approval of program content, schedules and administrative procedures and changes thereto.
- 4.5 Training Coordinator is responsible for:
 - a) Coordinating shift training.
 - b) Scheduling performance reviews to determine the adequacy of training for TMI-1 Operations.
 - c) Providing liaison for TMI-1 Operations Division with the Licensed Operator Training group in conducting training needs analysis and establishing training requirements.

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LICENSED OPERATOR REQUALIFICATION
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1-00

- d) Reviewing plant drill critiques and initiating additions or modifications to training programs to correct performance deficiencies noted.
 - e) Ensuring required performance evaluations are conducted during simulator and drill exercises.
 - f) Recommending changes and modifications to be analyzed for review in the operational review program.
 - g) Recommending expanded coverage of plant design changes, equipment modifications, procedure changes, and technical specification changes in the Operational Proficiency Lecture Series.
 - h) Providing periodic observation to the Training Department identifying job performance results related to requalification training.
 - i) Designating licensed SRO's to conduct oral examinations for those individuals failing to maintain active status.
- 4.6 The Director - TMI-I, through the Operations and Maintenance Director and the Manager, Plant Operations, certifies operators for requalification and relicensing. He certifies licensed operators upon completion of the Inactive Status Retraining Program.

5.0 REFERENCES

- 5.1 10 CFR 55, Appendix A, Revision dated 1 Jan 82, "Operator's Licenses."
- 5.2 NRC letter of March 28, 1980 on Qualifications of Reactor Operators
- 5.3 NUREG 0737, Enclosure 3, "Clarification of TMI Action Plan Requirements."
- 5.4 ANS 3.1, 1978, "Standard for Selection, Qualification and Training of Personnel for Nuclear Power Plants."
- 5.5 INPO-Nuclear Power Plant Requalification Program of Licensed Personnel
- 5.6 6211-ADM-2611.02 Senior Reactor Operator Replacement Training Program, Unit I.
- 5.7 Replacement Operator Training Program, Unit I.
- 5.8 6210-ADM-255.01 Control of Examinations for Unit I and II
- 5.9 6200-ADM-2600.01 Control of Examinations

6.0 ATTACHMENTS

- 6.1 Appendix A, "Off-Shift Licensed Operator Watchstanding Documentation"

7.0 PROGRAM DESCRIPTION

7.1 GOALS

The Requalification Program goals are to:

- 1) Maintain nuclear plant operational safety and reliability.

- 2) Assure that licensed personnel maintain the high level of skill and knowledge required to accomplish routine and emergency duties.

- 3) Establish a system for evaluating and documenting licensed personnel proficiency and competency.

7.2 PRE-PLANNED LECTURE SERIES

The operator requalification program shall include pre-planned training sessions conducted on a regular and continuing basis. The training sessions shall include two types of lecture series as follows:

- 1) Fundamentals Review Lecture Series
- 2) Operational Proficiency Lecture Series

7.2.1 Fundamentals Review Lecture Series

The Fundamentals Review training sessions cover areas in which the knowledge required of a licensed individual is relatively constant.

A. Lecture Series Topics

The Fundamentals Review lecture topics are selected on an as-needed basis from the following list:

- 1) Theory and Principles of Reactor Operation.
- 2) Theory and Fundamentals of Heat Transfer, Fluid Flow and Thermodynamics.
- 3) Features of Facility Design including Plant Systems.
- 4) Nuclear Plant Operating Characteristics Including Operating Experience.
- 5) Plant Instrumentation and Control Systems.
- 6) Plant Protection Systems.
- 7) Engineered Safety Systems.
- 8) Radiation Control and Safety and Plant Chemistry.
- 9) Applicable Portions of Title 10, Chapter I, Code of Federal Regulations.
- 10) Fuel Handling.

B. Lecture Series Topic selection

The topics presented in the Fundamentals Review series should reflect the general results of the annual examinations and performance of the licensed personnel as evaluated by the Manager, Plant Operations and the Operations and Maintenance Director. The scope of the lecture series should be determined by the Supervisor, Licensed Operator Training and approved by the Operator Training Manager. The depth of coverage in each topic should reflect typical deficiencies identified by the annual examinations, as well as those identified by the Training Coordinator.

7.2.2 Operational Proficiency Lecture Series

The Operational Proficiency training sessions cover areas which involve essential plant operational guidelines.

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LICENSED OPERATOR REQUALIFICATION
TRAINING PROGRAM DESCRIPTION (UNIT 1)

Revision No.

1-00

A. Lecture Series Topics

The Operational Proficiency lecture topics are selected to ensure coverage of essential plant operational guidelines and to ensure operational changes and experiences are integrated into licensed individuals training. The lecture topics are selected from the following list:

- 1) Normal, Abnormal and Emergency Operating Procedures and changes thereto.
- 2) Administrative Procedures, Conditions and Limitations and Technical Specifications.
- 3) Major Operational Evolutions.
- 4) Facility Design and License Changes.
- 5) Operating History and Problems.
- 6) Related Nuclear Industry Operating Experience.
- 7) Mitigation of Accidents Involving a Degraded Core.

B. Lecture Series Topic Selection

The topics presented in the Operational Proficiency Series shall include topics listed in Section 7.2.2.(A), unless the applicable information is covered in another appropriate manner, such as staff discussion sessions or Operational Review Program (Section 7.4) discussion sessions.

The scope of the lecture series should be determined by the Supervisor, Licensed Operator Training and approved by the Operator Training Manager taking into account the inputs from the Manager, Plant Operations, the Training Coordinator and the Operations and Maintenance Director. The depth of the coverage in each topic should reflect the knowledge required of the Licensed Senior Operator.

7.2.3**Pre-Planned Lecture Series Schedule**

The Pre-planned Lecture Series shall be scheduled on an annual basis. Lectures may be deferred due to unanticipated events, but should be conducted as soon as practicable thereafter and within the annual cycle. The lecture series shall be held on a continuing basis with a weekly schedule of lectures designed to be repeated for each shift when that shift is designated for its training week. The program and schedule will be determined by unit operations or projected operations and must take into account planned and unplanned outages and available simulator time. It shall typically involve up to 240 contact hours of instruction divided among the program topics and appropriately scheduled throughout the year. Records of the topics covered in each session shall be maintained by the Training Department.

7.2.4

Pre-Planned Lecture Series Attendance

Attendance of all licensed personnel shall be recorded. Absences should be approved in advance by the Manager, Plant Operations or the Operations and Maintenance Director, Unit 1, and should be limited to one training week per year. Additional absences, unless approved by the Manager, Plant Operations, shall result in the individual being removed from licensed duties and placed in an accelerated requalification program until such time as the missed material is made up. In any case, the individual who misses training shall be responsible for the material presented in his absence and shall take the quiz that was given on the missed material. Those personnel whose annual written examination indicates that a mandatory upgrading of their knowledge level is required, must attend the applicable pre-planned lecture series presentation. Mandatory attendance requirements shall be determined by the Supervisor, Licensed Operator Training and approved by the Manager, Plant Operations.

7.2.5

Pre-Planned Lecture series Training Methods

The pre-planned lecture series shall use training sessions supported by prepared lesson plans.

A. Lecture Presentation

For each training session in the lecture series, a lesson plan shall be prepared, reviewed, and approved in accordance with applicable Training Department Procedures. The incorporation of training aids such as trainee handouts, films, slides, models, transparencies, and videotape presentations is encouraged. The TCR shall become the reference source for the information covered during the lecture and shall be retained as part of the program records.

In the event that videotape or film presentations or computer-based instruction are used, an instructor shall be available to embellish, explain or emphasize the presentation and to respond to any questions or comments from the trainees.

B. Study Periods

Study periods should be scheduled in conjunction with the Pre-Planned Lecture Series to provide licensed trainees an opportunity to reinforce the lecture series learning experience and to study new or additional materials. While individual self-study is encouraged, it should not be substituted for training sessions implemented by an instructor conducted as part of the Pre-planned Lecture Series.

C. Instructor Qualifications

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1. Training Department and facility instructors who teach systems, integrated responses and transient courses shall have demonstrated their competence to the NRC by successful completion of a senior operator examination or certification. For other subject areas permanent instructors shall be qualified in accordance with Training Department Procedures.

2. "Guest" lecturers who are experts in a particular subject area need not possess the above qualification. The scheduling and appearance of "Guest" lecturers shall be approved in writing by the Operator Training Manager or Manager, Plant Training.

7.2.6 Pre-Planned Lecture Series Evaluation

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

A. Lecture Series Quiz

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

1. Quiz Administration

During or at the completion of a group of lectures, an evaluation of trainee knowledge shall be made. The evaluation shall contain questions related to the lesson plan objectives covered during the lectures. All lecture topics covered during the training session should be represented by questions in the evaluation. In addition, questions shall be included from selected abnormal and emergency procedures as designated by the Supervisor Licensed Operator Training, such that all abnormal and emergency procedures are tested on a biennial basis. A variety of question types may be used, but questions requiring analysis or detailed discussion should predominate. Exams shall be prepared and controlled in accordance with references 5.8 and 5.9.

2. Quiz Standards

Quizzes shall be evaluated and a grade determined for each trainee. A performance standard of 80% shall be established for a written quiz. Trainees who do not meet these performance standards shall complete a remedial review process within eight (8) weeks consisting of:

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- a) Trainee review of the training session material associated with identified knowledge deficiencies.
- b) Trainee review of associated reference material identified by the instructor.
- c) 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 Manager, Plant Operations with copies to the Operations and Maintenance Director and the Director, TMI-1, via the Operator Training Manager and Manager, Plant Training of the evaluation results and provide a recommendation regarding the trainee's removal from licensed duties and entrance into an accelerated requalification program (Section 7.6.1). Trainees whose attendance at all or part of the training sessions covered by a particular quiz is mandatory based on the previous annual examination must achieve a score of at least 80% on the applicable sections of the first quiz or be assigned an accelerated requalification program per section 7.6.1.

B. Lecture Series Effectiveness

The effectiveness of the lecture series should be evaluated by the trainees, Manager, Plant Operations and the Supervisor, Licensed Operator Training. The results of this evaluation should be factored into subsequent requalification training.

1. Lecture Series Evaluation

An overall evaluation of the annual lecture series should be conducted on at least an annual basis. The evaluation should encompass the instructors, training materials, presentation techniques, quiz techniques, and classroom facilities.

This evaluation should be conducted by individuals designated by the Supervisor, Licensed Operator Training and should consider input from the trainees, Manager, Plant Operations and the program instructors. Significant problems should be considered and resolved by the Supervisor, Licensed Operator Training and the Operator Training Manager.,

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2. Presentation Evaluation

Evaluation of selected lecture series training sessions shall be conducted periodically. The evaluations should be directed toward ensuring overall quality of instruction for the lecture series. The evaluation should encompass instructor preparation, presentation techniques, and technical content of the lecture. This evaluation should be conducted by personnel designated by the Manager, Plant Training, Operator Training Manager, or Training Coordinator.

Problems identified by these evaluations should be resolved by the instructor and the Supervisor, Licensed Operator Training.

7.3 SKILLS TRAINING AND EVALUATION

In order to maintain an acceptable level of skills and familiarity associated with the nuclear plant systems, controls, and operational procedures, each licensed individual shall participate in frequent and varied plant evolutions. Each licensed individual shall demonstrate operational proficiency by participating in the following activities:

- 1) Reactivity Manipulations and Plant Evolutions
- 2) Nuclear Plant Simulator Exercises, Basic Principles Trainer
- 3) Plant Drill Program

Shift Technical Advisors (STA's) licensed as senior reactor operators may meet this requirement by filling the role of the STA during these activities.

To maintain these skills, licensed operators shall actually manipulate the controls, while licensed senior operators may either manipulate or actively supervise manipulation of the controls. Training should be planned so that skills training exercises are repeated until proficiency is demonstrated.

During simulator training sessions, the team concept should be utilized, emphasizing individual roles in reporting, assignment of operational duties, use of plant procedures and use of technical specifications. Assignment to simulator training sessions which are direct interactions with the nuclear plant control panel should be made on a crew basis with other licensed individuals integrated into the crews. (Other licensed individuals' use is to be minimized, i.e. normally two or less).

During basic principles trainer training sessions, the individual concept should be utilized with one or two students on the trainer and additional students acting as observers. Large groups should be split such that part of the group is in the classroom and part on the training device on a rotating basis.

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Reactivity manipulations, plant evolutions, and exercises which may be considered in the Basic Principles Trainer Training program include:

- 1) Reactivity manipulation
- 2) Normal Plant Evolutions
- 3) Abnormal/Emergency Plant Evolutions
- 4) Demonstration of plant response to conditions identified from nuclear industry operating experiences.

Instructors presenting basic principles training sessions shall be certified by the Manager, Plant Training as qualified in accordance with applicable Training Department Procedure.

7.3.1 Reactivity Manipulations and Plant Evolutions

During the two year term of the NRC license, each licensed individual shall participate in a variety of reactivity control manipulations and plant evolutions.

A. Normal Plant Evolutions

On an annual basis, each licensed individual shall participate in the following plant evolutions either at the nuclear plant, or an applicable nuclear plant simulator.

- 1) Plant or reactor startup and power escalation to a range where reactivity feedback from nuclear heat addition is noticeable and heatup rate is established.
- 2) Plant shutdown.
- 3) Manual control of steam generator water level and/or feedwater flow during plant startup and/or shutdown.
- 4) Boration and/or dilution during power operation.
- 5) Reactor power changes of 10% or greater where rod control is in manual.
- 6) Reactor power changes of 10% or greater where load change is performed with load control in manual.
- 7) Operation of turbine controls in manual during turbine startup.
- 8) Decay heat removal system operation.
- 9) Incore monitoring system operation.
- 10) Control room calculations including heat balance, coolant inventory balance, and reactivity balance.

Individual performance during these plant evolutions shall be monitored and deficiencies corrected so that satisfactory proficiency is demonstrated.

B. Abnormal/Emergency Plant Evolutions

On an annual basis, each licensed individual shall participate in training exercises covering the following plant abnormal/emergency conditions either at a nuclear power plant simulator or during the plant drill program:

- 1) Reactor trip
- 2) Turbine or generator trip
- 3) Loss of coolant including:
 - a) Significant steam generator leaks
 - b) Significant pressurizer leaks
 - c) Large and small leaks located inside and outside primary containment (including leak rate determination for small leaks inside containment)
 - d) Saturated reactor coolant system response
- 4) Loss of coolant flow/natural circulation
- 5) Loss of all feedwater (normal and emergency)
- 6) Control room inaccessibility
- 7) Loss of shutdown cooling

On a two-year cyclic basis, each licensed individual shall participate in training exercises covering the following plant abnormal/emergency conditions either at a nuclear plant simulator or during the plant drill program.

- 1) Nuclear instrumentation failure(s)
- 2) Loss of protective system channel(s)
- 3) Mispositioned control rod(s) (or rod drops)
- 4) Inability to drive control rods
- 5) Conditions requiring use of emergency boration or standby liquid control system.
- 6) Fuel cladding failure or high activity in reactor coolant or offgas
- 7) Malfunction of automatic control system(s) which affect reactivity
- 8) Malfunction of reactor coolant pressure/volume control system
- 9) Loss of instrument air
- 10) Loss of electrical power and/or degraded power sources
- 11) Loss of condenser vacuum
- 12) Loss of service water
- 13) Loss of component cooling system or cooling to an individual component
- 14) Loss of normal feedwater or normal feedwater system failure

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15) Main steam line break (inside or outside containment)

Response to abnormal/emergency conditions should include use of alternate methods of accomplishing a given function, such as alternate methods of core cooling. Exercises involving multiple failures and/or operator error shall be included.

Utilization of applicable plant procedures and technical specifications during the training exercises should be maximized.

Individual and operational team performance during the abnormal/emergency training exercises shall be monitored and deficiencies corrected so that satisfactory proficiency is demonstrated.

C. Performance of Reactivity Manipulations and Plant Evolutions

Reactivity manipulations and plant evolutions shall be conducted either at the nuclear plant or at a suitable nuclear plant simulator.

1. Performance of Normal Plant Evolutions

Normal plant evolutions shall be either performed at the nuclear plant or performed at a suitable nuclear plant simulator.

2. Performance of Abnormal/Emergency Plant Evolutions

Abnormal/emergency plant evolutions shall be either performed at a nuclear plant simulator, or conducted during the plant drill program (Section 7.3.3).

In the event that an actual abnormal/emergency condition occurs at the plant and performance of the licensed personnel coping with the condition is satisfactory (as determined by the Manager, Plant Operations), credit for completion of a training exercise may be taken.

D. In plant performance of plant evolutions and reactivity manipulations outlined in 7.3.1 may be documented by the Shift Supervisor/Shift Foreman and forwarded to the Training Coordinator.

7.3.2 Nuclear Plant Simulator Exercises

A nuclear plant simulator provides a means of training licensed individuals to conduct normal plant evolutions and to cope with nuclear plant transient and accident conditions. Licensed individuals shall participate in a structured training program utilizing a nuclear plant simulator on an annual basis.

Each licensed individual shall complete nuclear plant simulator training sessions involving at least twenty (20) hours of direct interaction with the simulator nuclear plant control panel on an annual basis. Brief post-evolution critiques conducted at the simulator nuclear plant control panels may be considered as part of the direct interaction session. Lecture sessions conducted in conjunction with a simulator training program covering topics designated in the Pre-planned Lecture Series may be credited toward fulfilling the requirements of Section 7.2.

Reactivity manipulations, plant evolutions, and exercises which should be considered in the simulator training program include:

- 1) Normal Plant Evolutions (Section 7.3.1(A)).
- 2) Abnormal/Emergency Plant Evolutions (Section 7.3.1(B)).
- 3) Verification of Plant Operating Procedure Adequacy
- 4) Demonstration of plant response to conditions identified from nuclear industry operating experiences.

Instructors presenting simulator training sessions shall have demonstrated their competence to the NRC by successful completion of a Senior Operator Examination or certification.

7.3.3

Basic Principles Trainer

A basic principles trainer provides a means of training licensed individuals on the principles of nuclear plant operation, focusing on major system operation under steady-state and transient conditions. The main difference between the simulator and the basic principles trainer is size and complexity of controls, in that trainees can conduct many of the same evolutions, such as reactor and plant startups and shutdowns, on both devices.

7.3.4

Instructors presenting basic principles training sessions shall be qualified as BPT Instructors. The Basic Principles Trainer shall be utilized for a minimum of forty (40) hours of training session per year. This annual requirement shall be on a prorata basis dependent on availability.

Plant Drill Program

Plant drills provide a means of training licensed individuals in responding to plant abnormal/emergency conditions. Licensed individuals shall participate in the plant drill program on an annual basis.

A.

Plant Drills

Plant drills shall be conducted so that each licensed individual actively participates in drills covering abnormal/emergency plant evolutions (Section 7.3.1(B)) which are not adequately covered in the nuclear plant simulator training program (Section 7.3.2). Participation in a plant drill involves either responding to drill conditions or being an assigned monitor for observing/evaluating response to a drill. Plant drills may be structured to review or carry out actions required to respond to abnormal/emergency plant conditions.

Plant drills may be conducted with the approval of the Manager, Plant Operations, on an individual or team basis and may involve:

- 1) Reviewing plant procedure steps.
- 2) Identifying actions required to establish stable plant conditions.
- 3) Identifying equipment control locations and functions.
- 4) Identifying expected plant instrumentation and alarm response.
- 5) Reviewing communications necessary to gather information or coordinate team actions.

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- 6) Identifying supplementary actions aimed at mitigating results or causes of plant abnormal/emergency conditions.

B. Plant Drill Scenarios

Each plant drill must be carefully planned and monitored in order to ensure actual abnormal/emergency conditions are not inadvertently initiated during the drill and in order to evaluate individual or team response to the drill conditions. Each plant drill structured to include carrying out actions should be planned in a prepared drill scenario, approved by the Manager, Plant Operations. The Operations and Maintenance Director and Director TMI-1 shall approve scenarios for major emergency drills, except as provided for by Plant/Radiation Emergency drill authorization requirements. The drill scenario should include the following:

- 1) Purpose/objectives of the drill
- 2) Initial conditions
- 3) General description
- 4) Method of initiation
- 5) Precautions and limitations
- 6) Sequence of expected actions
- 7) Point of termination/conditions under which the drill is to be secured
- 8) Final conditions
- 9) Monitors required/location

The drill performance should be evaluated and deficiencies identified. A drill critique should be held by the Senior Monitor with the drill participants. Deficiencies identified should be reviewed by the Training Coordinator. Additions or modifications to training programs required to correct performance deficiencies should be initiated by the Training Coordinator and/or the Manager, Plant Operations. (The review/program modification does not apply to Plant/Radiation Emergency Drills conducted by Emergency Planning).

7.3.5

Skills Evaluation System

Licensed personnel performance and competency related to performing licensed duties shall be periodically evaluated. 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.

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Evaluation of licensed personnel job performance should be utilized to relate job performance to requalification training. The Manager, Plant Operations and Training Coordinator should provide the Supervisor, Licensed Operator Training or the Operator Training Manager with periodic observations identifying job performance results related to requalification training. Each licensed individual's performance shall be evaluated during the following situations:

- 1) Nuclear Plant simulator exercises (includes applicable Basic Principles Trainer exercises)
- 2) Plant drills

The Training Coordinator should ensure evaluations are conducted during the simulator and drill exercises.

7.3.6

Skills Training Participation

In the event that skills training guidelines for participation in normal plant evolutions (Section 7.3.1(A)), abnormal/emergency plant evolutions (Section 7.3.1(B)) or plant drills (Section 7.3.3(A)) are not met, exercises which will fulfill the requirements should be scheduled and completed within twelve (12) weeks of the required period. If the requirements are not completed within the twelve (12) week period, the Supervisor, Licensed Operator Training shall notify plant management and the Director TMI-1 via the Operator Training Manager and the Manager, Plant Training and provide a recommendation regarding the licensed individual's removal from licensed duties.

In addition to meeting the requirements for participation noted above, Off Shift licensed personnel assigned to the Operations Department shall actively participate in control room operation a minimum of one shift per month. Licensed instructors from the Training Department staff and other on-site licensed personnel shall actively participate in control room operation a minimum of two shifts per month. During this period these licensed personnel must assume (actual or under instruction) and perform the duties of the on shift licensed operator as indicated by completing Appendix A and forwarding to the Training Department.

Shift Technical Advisors (STA's) holding SRO licenses meet these requirements as long as they are assigned to and actually participating in shift operations. If they are removed from shift work for special assignment, etc., they shall be required to stand one shift per month.

Based on schedule constraints, satisfactory participation shall be defined as meeting the requirements on a quarterly basis. (i.e. three or six shifts depending on licensed individual as addressed above).

For non-watchstanding personnel assigned as senior supervisory personnel in operations who are fulfilling the provisions of their individual licenses by actively functioning in their normal position, waivers of watchstanding requirements may be authorized by the Operations and Maintenance Director provided the licensed operator (1) maintains a current knowledge of actual plant conditions and (2) participates in overall plant operations on a periodic basis to a depth consistent with level required of the licensed, on shift operators and senior operators.

If an individual does not meet his watchstanding requirements by the end of the month following a calendar quarter, he shall be assigned to meet the requirements of Inactive Status Retraining Program, Section 7.6.2.

7.3.7

Documentation of Skills Training and Evaluations as outlined in Section 7.3 shall be maintained in the Training Department Records.

7.4 OPERATIONAL REVIEW PROGRAM

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

7.4.1

Modification Review

A continuing system shall be established by the Manager, Plant Operations so licensed individuals review documented plant design 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 and their

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operational implications collected. This information should be formally transmitted to all licensed individuals with acknowledgement of review required. Changes to emergency procedures and technical specifications shall be read per OS-1. 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.

Expanded coverage of plant design changes, equipment modifications, procedure changes and technical specification changes in the Operational Proficiency Lecture Series (Section 7.2.2) should be considered by the Supervisor, Licensed Operator Training. On-shift supervisory (SRU) 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.

7.4.2

Operating Experience Review

A continuing system shall be established by the Manager, Plant Operations so licensed individuals review operating experience from TMI and from 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 shall be considered:

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

This information should be formally transmitted to all licensed individuals with required acknowledgement of review. The Manager, Plant Operations should ensure that all on-shift licensed personnel review the information in a timely manner. Technical Functions personnel assigned to assess plant operating experience and the Supervisor,

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Licensed Operator Training shall specify operating experience to be analyzed for training purposes, with information transmitted to all licensed personnel for review. Subsequent coverage of operating experience in the Operational Proficiency Lecture Series (Section 7.2.2) should be considered by the Supervisor, Licensed Operator Training. Selected nuclear plant accident/transient situations shall be analyzed and integrated into the Nuclear Plant Simulator Exercises (Section 7.3.2) or the Plant Drill Program (Section 7.3.3).

7.5 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 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.

7.5.1 Annual Written Examination

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

A. Written Examination Content

The written examination shall contain examination questions covering the topics addressed in the Fundamentals Review Lecture Series (7.2.1) and the Operational Proficiency Lecture Series (7.2.2). The topics shall be grouped into four (4) examination categories for each license level (RO or SRO). The examination shall be structured so that the level of questioning is consistent with the individual's license level (RO or SRO) and current format of NRC licensing examinations.

B. 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 following guidelines should be considered:

- 1) An examination question file shall be assembled containing questions and answers on each examination topic.
- 2) Questions shall be formulated in accordance with reference 5.9. Sources should include:
 - a) Licensed personnel training program.
 - b) Requalification programs.
 - c) Plant documents such as technical specifications and procedures.

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- d) Previous examinations.
 - e) Manager, Plant Operations.
 - f) Operating experience.
 - g) Plant design changes and system modifications.
- 3) The examination should include a variety of question types, but questions requiring analysis and/or explanation should predominate.
 - 4) The Supervisor, Licensed Operator Training shall designate individuals to update the examination questions and answers file annually.

Personnel designated by the Supervisor, Licensed Operator Training shall prepare the written examination(s) utilizing the examination question file. The number of different examinations prepared should be consistent with preventing examination compromise. The examination and answer key should be reviewed by the Supervisor, Licensed Operator Training and approved by the Operator Training Manager, and Manager, Plant Operations prior to examination administration.

The Supervisor, Licensed Operator Training shall designate qualified personnel to grade the written examination and shall review the graded examinations for grading techniques and consistency.

C. Examination Performance Standards

A licensed individual receiving a grade of less than 70% in any examination category or an overall grade of less than 80% shall be relieved of his license duties and placed in an accelerated requalification program (Section 7.6.1).

Under special circumstances where a grade of less than 70% has been scored in a single section with the overall average greater than 80%, the Director, TMI-1 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 70% 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-1.

7.5.2

Annual Oral Examination

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

A. Oral Examination Content

The oral examination should contain questions covering the following areas:

- 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) Plant transient and accident response.
- 6) Plant modifications.
- 7) Procedure changes.
- 8) Technical Specifications.
- 9) Emergency Plan.
- 10) Plant Operating history and problems.
- 11) Related nuclear industry operating experiences.

B. Oral Examination Administration

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.

The Supervisor, Licensed Operator Training and the Manager, Plant Operations shall establish the oral examination schedule.

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 who have successfully completed education and training programs required for a senior operator's license. Each oral examination should be structured so that an examination time of two (2) hours or more is achieved.

The Oral examination should involve sessions conducted in the plant control room and in plant areas occupied by individuals whose actions are directed by the licensed operator.

C. Examination Performance Standards

A failing overall oral examination grade shall require the licensed individual to be removed from

his license duties and be placed in an accelerated requalification program (Section 7.6.1).

7.6 SPECIAL RETRAINING PROGRAMS

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

7.6.1 Accelerated Requalification Program

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

A. 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 per Section 7.5.1(C).
- 2) Annual requalification oral examination performance deficiencies per Section 7.5.2(C).
- 3) Pre-planned lecture series quiz performance deficiencies per Section 7.2.6(A)(2).
- 4) Significant licensed duty performance deficiencies identified by the Manager, Plant Operations and/or the Supervisor, Licensed Operator Training.

B. 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 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 the Manager, Plant Operations.

C. 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 or utilizing a simulator.

Personnel assigned to implement the training exercises shall be qualified in accordance with Section 7.2.5(C) or 7.3.2 as appropriate.

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

Performance Standards

Successful completion of the accelerated requalification program shall be determined by administering an examination. The examination shall cover all categories of identified deficiencies from written and/or oral examinations. 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.

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.

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 TMI-1, 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.

7.6.2

Inactive Status Retraining

Assignment to the Inactive Status Retraining Program is required if: (1) an individual has not actively performed licensed duties for a period of four months or longer or (2) an individual has not met the watchstanding requirements established in section 7.3.6.

Active status can be maintained by performance of licensed duties and participation in the licensed personnel requalification program. Performance of licensed duties involves manipulation of controls which directly affect reactivity or power level of the reactor or directing the licensed activities of licensed operators, and for those licensed individuals not normally assigned to an operating shift, completing the requirements of Section 7.3.6 for participation in control room operations.

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In the event that a licensed individual does not maintain an active status, the Training Coordinator shall designate, subject to approval of the Manager, Plant Operations, a Licensed Senior Operator to conduct an oral examination similar in 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 (Section 7.5.1) shall be administered to the licensed individual prior to resuming licensed duties. Consideration should be given by the Manager, Plant Operations to assigning the licensed individual to a training status on an operating shift prior to resuming licensed duties. The performance standards applied to the annual requalification examination shall be used in evaluating the results of the oral and written examinations. If the performance standards are not met, the licensed individual shall complete an accelerated requalification program prior to resuming licensed duties.

Licensed duties may be resumed only upon certification by the Director TMI-1, which must be forwarded to the NRC.

Certification by the Director, TMI-1 is not required when the individual has entered the program based on watchstanding deficiencies, but has otherwise performed licensed duties within the preceding four (4) months.

7.6.3

Newly Licensed Individuals

Newly licensed individuals shall enter the requalification program and participate in the annual program cycle upon receipt of their license. Newly licensed individuals whose NRC license date is less than three (3) months prior to an annual requalification examination are excused from taking the annual written and oral examinations.

7.7 REQUALIFICATION PROGRAM EVALUATION

A requalification program review and evaluation shall be conducted on an annual basis by the Supervisor, Licensed Operator Training. The areas encompassed by the review should include:

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- 1) Inspection, audit and evaluation reports of requalification training completed by outside organizations and facility personnel.
- 2) Licensed individual performance evaluations related to licensed duties.
- 3) Program oral and written examination results.
- 4) Plant operational problems related to licensed individual knowledge or skills deficiencies.
- 5) Licensee Event Reports related to licensed individual performance from the plant and the nuclear industry.
- 6) Changes in job assignments related to licensed duties and/or safety related functions of licensed operators.
- 7) Regulations and standards affecting licensed operator retraining.
- 8) Assessment of licensed personnel performance deficiencies related to training prepared by the Manager, Plant Operations.
- 9) Feedback from Operations/Training meetings held throughout the year.

Requalification program curriculum deficiencies and licensed operator retraining needs determined by the review shall be identified, recommended corrective actions structured and a report formulated for review by the training organization through the Director of Nuclear Assurance and the operations organization through the Director, TMI-1.

Requalification program deficiencies or required changes which need immediate action or significant program modification should be evaluated by the Supervisor, Licensed Operator Training as soon as practicable. Necessary corrective action shall be structured by the Supervisor, Licensed Operator Training and reviewed as above.

7.8 REQUALIFICATION PROGRAM RECORDS

Records of licensed individuals' performance in the requalification program shall be maintained in an auditable manner. The Supervisor, Licensed Operator Training is responsible for establishing the following requalification program records:

- 1) Oral and written examination results for each licensee.
- 2) Written examination questions and answer keys.
- 3) Lecture series attendance records.
- 4) Lecture series lesson plans.
- 5) Plant drill participation records.
- 6) Reactivity manipulation and plant evolution participation records.
- 7) Simulator training participation records.
- 8) Training Content Records

These records shall be maintained by the Training Department's Administrative Support Section.

Operational review series participation records shall be established and maintained by the Operations Department.

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APPENDIX A

OFF SHIFT LICENSED OPERATOR
WATCH STANDING DOCUMENTATIONI certify that _____ has satisfactorily
Off Shift Licensed Operatorassumed and performed the SS/SF/CRO duties (actual or under
(Circle One)instruction) for the 11-7/7-3/3-11 shift on _____
(Circle One) Date_____
Shift Supervisor