

DUKE POWER COMPANY
McGUIRE NUCLEAR STATION
REQUALIFICATION PROGRAM
FOR
NRC LICENSED PERSONNEL

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McGUIRE NUCLEAR STATION
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1.0 INTRODUCTION

Appendix A to 10CFR55 requires all licensed operators to participate in an NRC approved requalification program. The requalification program as herein described for McGuire Nuclear Station, is in accordance with the latest INPO guidelines as described in their released document of 11-3-80. This requalification program consists of pre-planned lecture series, skills training and evaluation, operational review, and an annual examination and evaluation.

The operator requalification program shall be conducted on a cyclical basis so that all program requirements are completed in a period not to exceed two years.

2.0 PRE-PLANNED LECTURE SERIES

The requalification program will include two types of lecture series as follows:

- A. Fundamental Review Lecture Series
- B. Operational Proficiency Lecture Series

2.1 FUNDAMENTAL REVIEW LECTURE SERIES

The Fundamentals Review lecture topics are selected on as-needed basis to reflect the results of the annual exam, as well as past performance of licensed personnel. The following topics are typical of what will be covered during this lecture series.

- A. Theory and Principles of Reactor Operation
- B. Heat Transfer, Fluid Flow and Thermodynamics
- C. Features of Facility Design, including Plant Systems
- D. General and Specific Plant Operating Characteristics including Expected response to Equipment Failure
- E. Plant Instrumentation and Control Systems
- F. Plant Protection Systems
- G. Radiation Control and Safety
- H. Engineered Safety Systems
- I. Applicable Portions of Title 10, Chapter I, Code of Federal Regulations
- J. Fuel Handling and Core Parameters
- K. Plant Chemistry

2.2 OPERATIONAL PROFICIENCY LECTURE SERIES

The Operational Proficiency lecture topics are selected to ensure coverage of essential plant operational guidelines, and reflect operational changes and experiences. The following topics are typical of what will be covered during this lecture series:

- A. Normal, Abnormal and Emergency Operating Procedures
- B. Technical Specifications
- C. Administrative Procedure, Conditions, and Limitations
- D. Major Operational Evaluations
- E. Facility Design and License Changes
- F. Procedure Changes
- G. Operating History and Problems
- H. Related Nuclear Industry Operating Experience
- I. Accident Mitigation of Degraded Core

2.3 REQUALIFICATION TRAINING TIME COMMITMENTS

Total Pre-planned lecture series training time annually for each licensed operator will consist of a minimum of 100 contact hours of classroom instruction.

3.0 SKILLS TRAINING AND EVALUATION (SIMULATOR OR PLANT)

3.1 Each licensed individual shall demonstrate operational proficiency by participating in the following skill phases of requalification training.

- A. Reactivity Manipulations
- B. Plant Evolutions
- C. Nuclear Plant Simulator Exercises

3.2 REACTIVITY MANIPULATIONS

On an annual basis, each licensed operator will participate in evolutions selected from the following list, either on the McGuire plant or at the Training Center simulator. A minimum of any five (5) such evolutions per year are required for satisfying this requirement. Items with an asterisk shall be performed on the Simulator annually.

- *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 to SR.
- *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, or where feedwater flow is controlled manually.
- 6. Reactor power changes of 10% or greater where load change is performed with the DEH turbine control in manual.
- 7. Operation of turbine controls in manual during turbine startup.
- 8. Decay Heat Removal System (ND) operation.
- 9. Operation of Manipulator crane during refueling over the core.

3.3 PLANT EVOLUTIONS (ABNORMAL/EMERGENCY)

3.3.1 On an annual basis, each licensed operator will participate in exercises covering the following plant abnormal/emergency conditions either at a McGuire operating unit or on the McGuire simulator.

1. Reactor trip
2. Turbine generator trip
3. Loss of reactor coolant flow
4. Load Rejection
5. Loss of Steam Generator Feedwater (CF/CA)
6. Leakage Calculation (LOCA)
7. Plant Operations during natural circulation
8. Loss of Natural Circulation
9. NCS at Saturation
10. Inadvertent NC system depressurization
11. Actions required for ATWS event
12. Loss of control room
13. Significant S/G Tube Leaks
14. Small LOCA (Inside and Outside Containment)
15. Large LOCA

3.3.2 On a two-year cyclical basis, each licensed operator will participate in exercises covering the following plant abnormal conditions at an operating unit of McGuire or at the McGuire simulator.

1. Malfunction of Nuclear Instrumentation System
2. Boron dilution - Conditions Requiring Emergency Boration
3. Control Failures Affecting Reactivity
4. Inoperable control rod (Control Rod Misalignment, Control Rod Drop, and Inability to Drive Control Rods)
5. Loss of makeup or letdown
6. High activity in Reactor coolant
7. Loss of Instrument Air System
8. Loss of Electrical Power
9. Loss of Condenser Vacuum
10. Loss of Nuclear Service Water System
11. Loss of Component Cooling Water System
12. Hi Activity in Off Gas
13. Secondary Line Rupture (Inside & Outside Cont.)
14. Loss of Residual Heat Removal
15. Loss of Protective System Channel
16. Malfunction of NC Pressure/Volume Control Systems
17. Feedwater System Failures

3.4 NUCLEAR PLANT SIMULATOR EXERCISES

3.4.1 Licensed operators are required to participate in a structured simulator training program on an annual basis, and the following guidelines shall apply:

1. Team concept utilized, emphasizing individual roles in reporting, assignment of operational duties, use of plant procedures and use of technical specifications.
2. No more than four (4) licensed operators will be assigned to participate in a requalification training session which requires direct interaction with the plant control panel.

3.4.2 Simulator training will consist of a minimum of twenty (20) hours for each year, which includes all simulator training consisting of reactivity manipulations, plant evolutions, and an annual simulator examination.

4.0 REQUALIFICATION SCHEDULE AND SEGMENT QUIZZES

- 4.1 The requalification schedule for McGuire consists of 5 ten week segments. Each shift is scheduled for approximately 2 weeks of training during each segment.
 - 4.1.1 The last segment will be utilized for administration of an annual requalification examination on subjects covered throughout the year, as well as general subjects as specified in Section 6.2.
 - 4.1.2 Licensed personnel are required to achieve a grade of 80% on each segment quiz. A grade of less than 80% but greater than 70% will result in management counseling with the individual concerned. A grade of less than 70% will require remedial self study, and a new quiz retake for that segment.
- 4.2 Licensed Training Staff are not required to attend the segment training but should participate in appropriate sections of equal to assure they are cognizant of current operating history problems, station modifications, etc.
- 4.3 Newly licensed personnel shall enter the Requalification Program upon receipt of their license.
- 4.4 Back-up licenses (licensed individuals who are not routinely assigned to normal shift rotation and provide back-up capability to the operating staff) by virtue of their job assignments come into more intimate contact with various aspects of power plant operation. These individuals should participate in the segmented requalification when possible, and take the segment quizzes, however they can be exempted from this requirement in certain circumstances as management needs dictate.
- 4.5 Licensed Reactor Operators (RO's) who are in training for a Senior license (SRO) will be exempt from all requalification requirements for the duration of their training. They will continue to be updated on changes in accordance with station administrative procedures. They will also receive training on emergency and abnormal procedures. Any RO who fails the SRO exam will be evaluated by Operations Department Managers (i.e. Superintendent of Operations, Operating Engineers, SRO's, Shift Supervisors) on their past and present job performance. A recommendation will be made based on this evaluation regarding the individual's return to licensed duties.

5.0 OPERATIONAL REVIEW PROGRAM

5.1 The Operational Review Program provides a system for review of selected operationally related events, reportable occurrences, nuclear industry information, changes to existing operational guidance or equipment, etc., to maintain continued update of licensed personnel, and establishes a means of disseminating new or changing information on a short term basis, if needed.

5.1.1 The following items are typical of those covered by the Operational Review Program:

1. Plant design changes
2. Station modifications
3. Procedure changes
4. Technical Specification changes
5. Pertinent IE Bulletin Information
6. Incident Reports (Station and Industry)
7. Audit, evaluation, and inspection reports
8. Publications covering nuclear industry information
9. NSAC/INPO significant event reports

5.1.2 The Operational Review Program is administered per McGuire Station Directive 3.1.38 with the exception of Item 5.2.

5.2 The Operational Review Program shall also include a review of the contents of the Emergency Procedures and Abnormal Procedures. This review will be conducted on a two year cyclic basis and documented.

6.0 ANNUAL REQUALIFICATION EXAMINATION

- 6.1 An annual requalification written and simulator examination will be administered to all licensed individuals to determine their knowledge of topics covered in the segmented requal program.
- 6.2 The written examination will be grouped into at least six (6) categories for evaluation purposes, and will contain questions covering topics which were presented during the yearly requal training segments, as well as from general topics requiring operator knowledge. Some typical examples are as follows:
1. Theory and Principles of Reactor Operations
 2. Heat Transfer, Fluid Flow and Thermodynamics
 3. Features of Facility Design
 4. General and Specific Plant Operating Characteristics
 5. Plant Instrumentation and Control Systems
 6. Plant Protection Systems
 7. Engineered Safety Systems
 8. Radiation Control and Safety
 9. Applicable Portions of Title 10, Chapter I, Code of Federal Regulations
 10. Fuel Handling and Core Parameters
 11. Normal, Abnormal and Emergency Operating Procedures
 12. Technical Specifications
 13. Administrative Procedures, Conditions and Limitations
 14. Nuclear Industry Operating Experience
 15. Accident Mitigation of Degraded Core
 16. Electrical Theory
- 6.3 A licensed operator receiving a grade of less than 70% in more than one examination category, or an overall grade of less than 80% shall be placed in an accelerated requal program consisting of self-study with instructor guidance and support, followed by an exam re-take. Failure of one category with less than 70% will require a category retake only, provided an 80% overall average is maintained.
- 6.4 An annual examination will be conducted on the simulator for each licensed operator during the last segment. A licensed operator receiving a grade of less than 80% on the Simulator exam shall receive additional training handouts with instructor guidance and support, followed by an exam retake using a different scenario.

- 6.5 Any licensed person who fails to meet the minimum grades stated in 6.3 and 6.4 will be removed from all licensed duties until such time as the requirements have been met.
- 6.6 Newly licensed individuals successfully completing their NRC licensing examination less than six (6) months prior to an annual requalification written examination, may be excused from taking the current annual requalification examination and the simulator examination.

7.0 ADMINISTRATIVE HANDLING OF REQUALIFICATION

7.1 INTRODUCTION

This section will define specific responsibilities and provide guidance in the implementation of the McGuire requalification program.

7.2 REACTIVITY MANIPULATIONS

1. A minimum of five (5) manipulations as defined in Section 3.0 will be accomplished per year with no more than two being of the same type.
2. Documentation of Reactivity Manipulations will be made at the plant or during simulator training with documentation forms transmitted to the Station Training Unit for formal record keeping of each licensed operator's performance. Each licensed operator is responsible to ensure his performance is adequately documented.

7.3 PLANT EVOLUTIONS

1. Training exercises as referred to in Section 3.3 are actual planned plant training drills, actual plant transients or simulated transients provided during the simulator phase of the requalification program.
2. Documentation of the exercises will be accomplished in the Control Room at the time of the event, or at the Training Center during the simulator phase of requalification training. Each licensed operator is responsible to ensure that required exercises are properly documented.

7.4 CLASSROOM/SIMULATOR TRAINING RECORDS

1. All classroom and simulator training results will be documented and transmitted to the Station Training Unit reflecting completion of each Requalification Segment.
2. Evaluations on personnel performance will be made by Training Services staff, and less than acceptable performance will result in plant management notification.
3. All records must be of auditable quality, and shall include the following:
 - A. Written examination results for each individual
 - B. Simulator training participation and evaluation

4. Records of training and qualification for current members of the station staff will be retained for the life of the station in accordance with Technical Specification 6.10.2.g. These records will include copies of written examinations administered, the answers given by the licensee, results of evaluations and documentation of any additional training administered in areas in which an operator or senior operator has exhibited deficiencies.