OPERATOR REQUALIFICATION PROGRAM

FOR THE MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY REACTOR

Revision 4 | August 1, 2018

OPERATOR REQUALIFICATION PROGRAM

FOR

THE MISSOURI UNIVERISTY OF SCIENCE AND TECHNOLOGY REACTOR

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1 Introduction

This document is the Operator Requalification Program for the Missouri University of Science and Technology Reactor(MSTR) which is required by 10 CFR 50.54(i)(i-1) and 10 CFR 55.59. All licensed operators at MSTR shall participate and satisfactorily complete this program during each licensed renewal period. Each licensed operator or senior operator shall include in his* licensed renewal application a statement that he has satisfactorily completed the requirements of this Requalification program.

* The generic term "his" will be used throughout this document in place of "his/her", similarly "he", "him", ect…

2 Description of the Program

The Requalification program is divided into three major areas, which are designed to provide assurance that all operators maintain competence in all aspects of licensed activities. The three areas are as follows:

a. A requalification cycle written examination, which is used to verify the operator's knowledge level. Preplanned lectures shall be used to retrain those operators who demonstrate deficiencies in any part of the examination.

b. On-the-job training, which will ensure (1) that the operator maintains his competence in manipulating the reactor controls and in operating all apparatus and mechanisms required by his license, (2) that the operator is cognizant of all design, procedure and license changes implemented during the requalification cycle, and (3) that he has a thorough understanding of all abnormal and emergency procedures.

c. Periodic observation and evaluation which will evaluate the performance of the operators to actual and simulated reactor conditions.

d. A requalification cycle consists of two consecutive calendar years with the first calendar as an odd year (e.g. 2005-2006).

2.1 Requalification Cycle Examination and Retraining Lectures

During each requalification cycle, a comprehensive, written examination will be administered to all operators having a reactor operator or a senior reactor operator license for more than one year. The content of this examination should be similar to that of a license examination administered by the Commission. The function of the examination is to establish the knowledge level of the operator in all areas applicable to the licensed activities he performs. The results of this examination shall provide the basis for a determination of those areas in which each operator needs retraining.

The examination will be scheduled early enough to permit retraining before the end of the requalification cycle.

The examination will contain questions from each of the following areas:

A. Principles of Reactor Operation and Reactor Theory;
B. Features of Facility Design;
C. General and Specific Operating Characteristics;
D. Plant Instrumentation and Control Systems
E. Protective and Engineered Safety Systems;
F. Standard and Emergency Operating Procedures;
G. Radiation Control and Safety;
H. Licensed, Technical Specifications and 10 CFR;
I. Safety Analysis (only Senior Reactor Operators are required to have questions in this area, but can be asked to Reactor Operators also)

At the discretion of the facility Training Coordinator, a review program may be instituted to prepare individuals for the requalification cycle examination. The review program may utilize, but is not limited to the following study aids:

a. Lectures or review seminars to present or discuss in a preplanned manner the information relative to each of the areas listed above. Personnel assigned to prepare questions or sections of the Requalification examination may be exempt for those specific questions or sections.

b. Worksheet questions and problems, which the operator can answer in his spare time.

The Training Coordinator will be assigned responsibility to prepare the nine sections of the requalification cycle examination. The examination with answer sheet will then be reviewed by a faculty member from the Nuclear Engineering Department of the Missouri University of Science and Technology or an otherwise knowledgeable person. The training Coordinator will assign to various staff members topics for which they must write, in outline form, and present to the rest of the staff in a formal lecture. The lectures will be on topics that will comply with 10 CFR 55, Appendix A. The evaluation of each operator will be facilitated by completing an examination record form as shown in Appendix A to this document.

An operator will be considered to be deficient in any area of the exam if he scores a grade of less that 70% in that area. If the average grade for an operator in all sections is less than 70%, the operator shall be relieved of all licensed activities until he has been retrained and satisfactorily passes re-examination with an average grade greater than 70%.

After all of the examinations have been graded, the Training Coordinator will prepare the retraining schedule for those operators who were deficient in any area. The Training Coordinator will use retraining schedule sheets as shown in Appendix A to facilitate the scheduling. The retraining program will consist of one or more preplanned lectures or tutoring sessions in each area of deficiency. These lectures will be supplemented by self-study or reference material.

After the retraining has been completed in each area, another examination will be given in that area to establish the operator's competence. This re-examination will be of the scope and complexity of the original exam, but will contain a different set of questions.

All examinations and re-examinations after they have been graded will be reviewed with the operator and will be retained in the facility's files for at least two years.

2.2 On-The-Job Training

This section of the program provides assurance that all operators will maintain competence in those major evolutions, which can be performed by licensed operators only. This section will also ensure that all operators maintain their knowledge of the facility to the extent that they are aware of all recent changes, which have been made to the license, to the facility and to the operating procedures. The on-the-job training requirements shall comply with 10 CFR 55.59 (c) (3) (i). Specifically, the items applicable to the Missouri University of Science and Technology Reactor include paragraphs (A), (B), and (E) of the above said regulation. The on-the-job requirements are outlined in detail in the checklist in Appendix of this document.

Each licensed operator shall acknowledge in writing a change in any operating procedure prior to conducting operations after the change has been implemented.

The on-the-job training requirements shall be spread out over the calendar year such that at least two of the total of five reactivity manipulations are completed in a six-month period. The Training Coordinator shall periodically review the on-the-job training checklist of each operator to ensure that he is progressing satisfactorily on his requalification.

2.3 Periodic Observation and Evaluation

Reactor management will on a continuing basis observe and evaluate the performance of all operators in order to maintain familiarity with the operator's competence in handling routine and emergency evolutions. This program implements the means of documenting the evaluations made by management.

The Training Coordinator, the Reactor Manager, or their designee (but a licensed operator) will annually conduct a performance evaluation of all operators during one of their reactivity manipulations. The person conducting the evaluation will complete an Operator Performance Evaluation Sheet (Appendix). The evaluator will also discuss or simulate abnormal or emergency conditions during the manipulations and grade the operator on his response to these conditions.

The response of an operator to a simulated or hypothetical emergency condition will be reviewed and evaluated by the Training Coordinator or Reactor Manger. This evaluation will be used to supplement that operator's performance evaluations under this program.

Should an operator evaluation demonstrate an overall unsatisfactory performance, the operator will be relieved of licensed duties and be placed in an accelerated retraining program until satisfactory performance is demonstrated.

3 Administration of the Program

3.1 Training Coordinator

The Facility Director shall assign a member of the reactor staff to be the Training Coordinator for this requalification program. The Training Coordinator shall be responsible for:

a. Administrating the overall program.

b. Scheduling the requalification cycle written examination.

c. Preparing the written examination and conducting any necessary review and retraining.

d. Assisting the instructors in the preparation of material, examinations, and retraining lectures or tutoring sessions.

e. Reviewing the graded examinations with the operators and scheduling any retraining indicated by the examination results.

f. Periodically reviewing the on-the-job training checklist of each operator to ensure that the operators are progressing satisfactorily in this area of requalification

g. Scheduling the checks and review required by the Requalification Program.

h. Scheduling the performance evaluations and the staff member who will conduct the evaluations.

i. Maintaining all of the requalification records required by Section 4.0.

j. Annually reviewing the content of this program.

k. Ensuring that all newly licensed operators are aware of requirements of this program and are provided with the necessary requalification materials.

3.2 Reactor Manger

The Reactor Manager will assist the Training Coordinator, as necessary; to ensure that all operators participate in and complete all of the requirements of this program prior to their license renewal date. They shall also schedule and conduct the reviews of changes in the license, facility design and operating procedures as required by the on-the-job training section.

3.3 Licensed Operators

The extensive responsibilities of the Training Coordinator for administering this program do not relieve the individual licensed operator of the responsibility for ensuring that all of the requirements of this requalification program have been completed prior to their license renewal date.

4 Records

As indicated in Section 3.1, the Training Coordinator is responsible for ensuring that all of the records required by this requalification program are maintained. The following records shall be retained at the facility during the time the operator license is valid:

a. All examinations, and required re-examinations, which were administered during the requalification period and the answers used to grade these examinations.

b. The examination review sheets completed after the requalification cycle examination and any subsequent re-examinations.

c. The operator performance evaluation sheets used to evaluate the operator's competence in operating the reactor.

d. The retraining schedule used to correct any deficiencies discovered through the requalification cycle examination.

e. Copies of the completed on-the-job training check sheets.

Appendix

ANNUAL ON-THE-JOB TRAINING REQUIRMENTS/CHECKLIST

Name of Operator:_____ Year:_____ License: RO___ SRO___

I. Control Manipulations and Plant Evolutions

In this paragraph the on-the-job training requirements outlined in 10 CFR 55.59 (c) (3) (i), which are applicable to the MSTR are specified. For reactor operators and senior operators, these requirements consist of the following control manipulations and plant evolutions (senior operators may direct these activities): Five reactivity changes to be performed annually with at least one change in each of the categories:

i. Startup
ii. Power change
iii. Shutdown

II. Nuclear Instrumentation Checks

Each licensed operator must perform at least two pre-startup checks of the Nuclear Instrumentation.

III. Reactor Fuel Handling

Each reactor operator shall participate in one fuel handling evolution and each senior reactor operator shall direct the activities of one fuel handling evolution.

IV. Radiation Monitors (portable)

Each licensed operator shall annually demonstrate to the Training Coordinator (TC) or Reactor Manager (RM) that he knows how to use, read and interpret the reading of the portable radiation monitors most often used at the facility.

Meter	Date	TC or RM's Initials
Neutron Monitor		
GM Counter		
Ionization Detector		

V. License Changes

Each licensed operator shall annually review and demonstrate his knowledge of the license changes, which have become effective in the past year. This review is to be conducted by the Reactor Manager.

License Change Number	Date Reviewed	RM Initials

Name of Operator:_____ Year:_____ License: RO___ SRO___

VI. Facility Design Changes

Each operator shall annually demonstrate his knowledge of the facility design changes, which have occurred in the past month. This review is to be conducted by the Training Coordinator.

Modification No.	Date Reviewed	TC Initials

ANNUAL ON-THE-JOB TRAINING REQUIRMENTS/CHECKLIST

Name of Operator:_____ Year:_____ License: RO___ SRO___

OPERATIONS CHECKLIST

Pre-Startup Checklist 1___ 2___

Startup ___ Power Change ___ Shutdown ___

Participate in Fuel Handling ___

Direct Fuel Handling (SRO only) ___

5 reactivity changes must be performed including 1 startup, power change, and shutdown.

Procedure	Date	Reactivity Change/Fuel Moved
Pre-Startup Checklist		////////////////////////////////////
Pre-Startup Checklist		////////////////////////////////////
Reactivity Change		
Reactivity Change		
Reactivity Change		
Reactivity Change		
Reactivity Change		
Fuel Handling		

Name of Operator:_____ Year:_____ License: RO___ SRO___

MSTR OPERATOR REQUALIFICATION PROGRAM PERFORMANCE EVALUATION FORM

Date _____Evolution Performed_____

		Excel.	Good	Aver.	Poor	Unsat.
PERFORMANCE UNDER NORMAL CONDITONS						
1.	Procedures – knowledge and understanding of					
2.	Console Log Entries – adequacy, completeness and legibility of entries					
3.	Check sheets and Data Sheets – thoroughness in completing checklist, accuracy of and interpretation of data on data sheets					
4.	Manipulation of Controls – proficiency in handling controls and positive approach to handling the plant					
5.	Use of Instrumentation – used all available instrumentation and properly interpreted same					
6.	Awareness of Reactor Conditions – knowledge of plant conditions, understanding trends or abnormal indication, response to changing conditions					
ABNORMAL OR EMERGENCY CONDITIONS						
7.	Immediate actions – recognized condition and took immediate steps to put plant in safe condition					
8.	Communications – communicated problem, took charge, initiated or directed corrective action					
9.	Follow-up Actions – ability to recover plant					
OVERALL PERFORMANCE						

ANNUAL ON-THE-JOB TRAINING REQUIRMENTS/CHECKLIST

Name of Operator:_____ Year:_____ License: RO___ SRO___

Abnormal or Emergency Conditions Imposed or Observed

Comments and Recommendations

Evaluator_____

Manager's Signature_____

Name of Operator:_____ Year:_____ License: RO___ SRO___

MSTR OPERATOR REQUALIFICATION CYCLE
EXAMINATION FORM

EXAMINATION TOPIC	Comp Grade	Exam Date	Reexamination Grade	Reexamination Date
A. Principles of Reactor Theory.				
B. Features of Facility Design.				
C. General and Specific Operating Characteristics.				
D. Instrumentation and Control Systems.				
E. Protective and Engineered Safety Systems.				
F. Standard and Emergency Operating Procedures.				
G. Radiation Control and Safety.				
H. Licensed, Technical Specifications and 10 CFR.				
*I. Safety Analysis				
Average Score				

*Not required of RO's

REQUALIFICATIN SUMMARY

Retraining Required No ____ Yes ____ Parts (circle) A B C D E F G H I

Recommend relieved of normal licensed activities while retraining
No ____ Yes ____

Comments

_____
_____
_____
_____
_____
_____
_____
_____

ANNUAL ON-THE-JOB TRAINING REQUIRMENTS/CHECKLIST

Name of Operator:_____ Year:_____ License: RO___ SRO___

Quarter 1	Startup Checklist*	Startup*	Power Change*	Shutdown*	Shutdown Checklist
January					
February					
March					
Quarter 2	Startup Checklist*	Startup*	Power Change*	Shutdown*	Shutdown Checklist
April					
May					
June					
Quarter 3	Startup Checklist*	Startup*	Power Change*	Shutdown*	Shutdown Checklist
July					
August					
September					
Quarter 4	Startup Checklist*	Startup*	Power Change*	Shutdown*	Shutdown Checklist
October					
November					
December					

Requirements per year: *2 per year

ANNUAL ON-THE-JOB TRAINING REQUIRMENTS/CHECKLIST

Name of Operator:_____ Year:_____ License: RO___ SRO___

Quarter 1	Licensed Duty*	Date Performed	Start Time	End Time	Total Time Spent
January					
February					
March					
Quarter 2	Licensed Duty*	Date Performed	Start Time	End Time	Total Time Spent
April					
May					
June					
Quarter 3	Licensed Duty*	Date Performed	Start Time	End Time	Total Time Spent
July					
August					
September					
Quarter 4	Licensed Duty*	Date Performed	Start Time	End Time	Total Time Spent
October					
November					
December					

Licensed Duties – Reactor Operations, Supervising Operations, SRO on Duty, etc.