



# UNIVERSITY OF MARYLAND

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Reference: UNIVERSITY OF MARYLAND, REQUEST FOR ADDITIONAL INFORMATION  
REGARDING THE LICENSE RENEWAL FOR THE MARYLAND UNIVERSITY  
TRAINING REACTOR ("MUTR") (TAC NO. ME1592), Docket No. 50-166, License  
No. R-70

In response to your July 16, 2012 Request for Additional Information, the University of Maryland hereby submits an updated Requalification Training Program for the Maryland University Training Reactor in connection with the renewal application identified above.

The Requalification Program for the MUTR was submitted on August 26, 2010 as an enclosure to the reply to a Notice of Violation issued to the University in NRC Non-Routine Inspection Report No. 50-166/2010-202 as supplemented on March 14 and May 22, 2012.

If there are questions about the information submitted, please write to me at: Department of Materials Science and Engineering, University of Maryland, College Park, MD 20742-2115 or email Materials Science and Engineering, University of Maryland, College Park, MD 20742-2115 or email me at [mohamad@umd.edu](mailto:mohamad@umd.edu). Please copy Prof. Robert Briber on any such correspondence: Department of Materials Science and Engineering, University of Maryland, College Park, MD 20742-2115; [rbriber@umd.edu](mailto:rbriber@umd.edu).

I declare under penalty of perjury that the foregoing is true and correct.

Sincerely,

Mohamad Al-Sheikhly  
Professor and Director  
Maryland University Training Reactor

Enclosures (1)  
cc: Robert Briber (By E-mail).

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NRC

## **1.0 PURPOSE**

This document sets forth the requirements for the Reactor Operator (RO) and Senior Reactor Operator (SRO) requalification program for the Maryland University Training Reactor (MUTR), in accordance with the Code of Federal Regulations, Title 10, Part 50.54, Condition of Licenses and 10CFR 55.59, Requalification.

## **2.0 SCHEDULE**

The operator Requalification Program cycle will last a period of two years, beginning on 1 January of the biennial year. A licensed operator will enter the requalification program on the date the USNRC issues a license and will continue in the program until either the expiration date of the current license or the date the current license is terminated.

## **3.0 REACTOR OPERATION**

The operator will be required to perform, as either a Reactor Operator or Senior Reactor Operator, a minimum of five reactor startups, significant (>10%) power changes, and shutdowns per year (ten during the two year requalification cycle).

## **4.0 REQUALIFICATION PROGRAM**

As part of the requalification program, licensed personnel will participate (as determined by the Reactor Director) as either a student or an instructor. The program will be on a continuing basis throughout the requalification cycle in those areas where annual operator and senior operator written examinations indicate that emphasis in scope and depth of coverage is needed in the following subjects:

1. Theory and principle of operation
2. General and specific operating characteristics
3. Reactor instrument and control systems
4. Reactor protection systems
5. Engineered safety systems
6. Normal, abnormal, and emergency operating procedures
7. Radiation safety and control
8. Technical Specifications
9. Applicable portions of Code of Federal Regulations Title 10, Chapters 1

Additionally, a series of lectures/seminars will be conducted throughout the requalification cycle, the frequency of which to be determined by the Reactor Director or his designee. The purpose of these lectures/seminars is to serve as refresher courses for currently licensed RO and SRO's as well as training and instruction for RO and SRO trainees. These lectures will be on a single topic (or related topics) in the areas outlined above, and will be of an average length of 30 to 35 minutes. It will be the responsibility of each

**REQUALIFICATION/TRAINING PROGRAM**  
**FOR THE**  
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licensee and trainee to review the material presented in every topic. This should be accomplished by attending the formal lectures, or, failing that, reviewing the subject matter on an individual basis. Portions of these requirements may be satisfied (as determined by the Reactor Director) by the licensed operator's participation in the instruction and/or training of students for the NRC license, or both.

## **5.0 EVALUATION**

The evaluation of each licensee's knowledge and performance of the requirements set forth in the requalification program will be accomplished by a written and an operating examination at the reactor console. The operating examination will also include an oral examination.

### **5.1 Normal/Abnormal conditions to be evaluated**

#### **Normal Conditions**

The evaluation shall include at a minimum an initial start-up checklist, operation to low power critical, reactivity manipulations above the point of adding heat, power manipulation to demonstrate that the operator may both increase and decrease power levels in both "STEADY STATE" and "AUTOMATIC" modes of operation, and placing the reactor in a "SHUTDOWN" condition.

During the initial startup, the examiner shall include an evaluation of the operator's ability to respond to failed or inoperable equipment; the establishment of high and very high radiation areas, identify set-points and limiting conditions for operations, administrative controls, and a familiarity of major reactor systems, including primary and secondary cooling systems.

The operator shall also identify required surveillance items, operating channels, and other maintenance and surveillance requirements as identified by the facility technical specifications.

#### **Abnormal Conditions**

During the operational phase of the examination, the operator shall be evaluated on actions to be performed in the event of scrams, water leaks, loss of power, low water level, and their responsibility in the event of a radioactive release, contaminated person, fuel failure, fire, natural disaster, security breach, and loss of confinement integrity.

The written and operating examinations for each licensed operator will be prepared and administered in accordance with NUREG-1478, Revision 2 (June 2007), ES601N – Requalification Examination Administration. The written examination will sample items specified in 10CFR55.41 and 10CFR55.43 as applicable to the facility. The operating examination will sample items specified in 10CFR55.45 as applicable to the facility. The Reactor Director or his designee will prepare the written examination and also administer the oral examination and console performance evaluation.

The written examination and the operating/oral examinations will be administered annually in the fourth quarter of each calendar year.

If a license holder scores less than 70% on any section of the annual written examination, the licensee will attend a makeup session on that section topic and will be retested on that section. An overall grade of 80% will be required as a passing score.

If an individual receives a grade of less than 80% overall, it will be mandatory that he/she be relieved of his/her licensed duties and enter an accelerated requalification program. Upon successfully passing a second written examination and certification of satisfactory rating by the Reactor Director, the individual may return to his/her licensed duties.

An unsatisfactory evaluation on the annual operation/oral examination will require that discussions of deficiencies take place between the licensee and the Reactor Director or other suitable qualified person designated by the Director. A second oral evaluation will be administered. If performance is again unsatisfactory, the licensee will be relieved of responsibilities and placed into an accelerated requalification program.

## **6.0 ACCELERATED REQUALIFICATION PROGRAM**

The additional training that a licensee may require (as indicated by his/her examination) will consist of additional written exams, console performance, and/or oral facility examination. The additional training and the examination that the licensee receives will depend upon the weaknesses exhibited on previous examinations. Either the Reactor Director or his designee will determine the number of lectures and examinations that a licensee will receive. The licensee must obtain a rating of at least 80% on the re-evaluation in order to be reassigned to his/her licensed duties.

## **7.0 DOCUMENT REVIEW**

The licensee will review during each requalification cycle the following documents and instructions that are pertinent to the operations of the reactor facility:

1. Reactor License (R-70)
2. Technical Specifications
3. MUTR Operating and Emergency Procedures
4. Code of Federal Regulations, Title 10, Chapter 1, Sections 19, 20, 50.54, 50.59, 55

## **8.0 RECORDS**

The following records will be maintained for each licensed operator and retained for the period until the license of the individual has expired or been terminated:

- Current copy of either the licensee's Reactor Operator or Senior Reactor Operator license.
- Copies of the graded requalification examinations administered.

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- The operator's Requalification Program checklist.
- The summary of training received by the licensee in the accelerated Requalification Program documented in a memorandum for record and any additional documentation that is pertinent to additional training received by the licensee.

## **9.0 ADMINISTRATION**

The Reactor Director or his designee is responsible for the development, administration, and execution of the Reactor Operator Requalification Program. The Reactor Director will be exempt from taking every other annual written examination, but will be required to perform the operations set forth in Section 3.0 and the review of documents set forth in Section 7.0. The most senior SRO will be exempt from taking the annual written examination on the years where the Reactor Director is required to take the examination. All operators shall be required to take the operational exam and the oral examination. Under no circumstances shall any operator complete the entire two year cycle without performing and passing at least one written examination.