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Document Control Desk
United States Nuclear Regulatory Commission
Washington, D.C. 20555-0001

SUBJECT: UNIVERSITY OF MARYLAND - REQUEST FOR ADDITIONAL INFORMATION RE: FOR THE RENEWAL OF FACILITY OPERATING LICENSE NO. R-70 THE MARYLAND UNIVERSITY TRAINING REACTOR DOCKET NO. 50-166

Enclosed please find the responses to RAIs #3, 5-12 dated July 28, 2016 for the University of Maryland Training Reactor (MUTR).

In addition to the RAIs that we have answered, additional definitions were added or enhanced as noted in the enclosure. We have removed the numbering and capitalized definitions throughout the technical specifications to enhance readability.

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

Sincerely,

Timothy W. Koeth

Timothy W. Koeth

A020
NRR

3.

a. How many separate modes can the MUTR be operated in, and what if, any protective functions, and interlocks exist for each mode?

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b. What is the significance of defining the STEADY STATE MODE in the TSs and not the others?

We have included the definition for Automatic Mode. The definition reads: Automatic mode operation shall mean operation of the reactor with the mode selector switch in the automatic position.

5. MUTR proposed TS 1.15, "Isolation," may contain a grammatical error. Provide a definition removing the "leads to," or justify why no change is necessary.

The definition was updated to now read:
ISOLATION | Isolation is the establishment of confinement by closing of doors leading from the reactor bay area into the balcony area on the top door, the door to the reception area on the ground door, and the building exterior doors.

5a. Provide a definition by removing the redundant requirement, or justify why no change is necessary. For example, "No experiments in or near the reactor are being moved or serviced that have, on movement, the smaller of: a reactivity worth exceeding the maximum value allowed for a single experiment, or a reactivity of one dollar." to "no experiments are moved or serviced that have, on movement, a reactivity worth exceeding $1.00."

There was no numbering between 5 & 6 so we have changed this number to 5a. We have updated the wording to agree with TS 3.6 Limits on Experiments specification 1. The new definition will now read:
(d) No experiments in or near the reactor are being moved or serviced that have, on movement, a reactivity worth of $1.00.

6.MUTR proposed TS 1.30, "Reactor Shutdown," describes two conditions which when met ensure the reactor is shutdown. Two separate reactivity values are described in proposed TS 1.30, item b, "maximum allowed value for a single experiment, or one dollar."

Revise the definition for proposed TS 1.30 by removing the redundant requirement, or justify why no change is necessary. For example, "No experiments are being moved or serviced that have, on movement, a reactivity worth exceeding the maximum value allowed for a single experiment, or one dollar, whichever is smaller." to "no experiments are moved or serviced that have, on movement, a reactivity worth exceeding $1.00."

We have adopted the ANSI/ANS-15.1-2007 standard definition of Reactor Shutdown. The definition now reads:

The reactor is shut down if it is subcritical by at least one dollar in the reference core condition with the reactivity worth of all installed experiments included.

7. MUTR proposed TS 1.31, "Reference Core Condition," provides a definition for the reference core. ANSI/ANS-15.1-2007 definition reference core condition states, "The condition of the core when it is at ambient temperature (cold) and the reactivity worth of xenon is negligible (<0.30 dollar)." While proposed TS 1.31 does define the temperature and xenon values, it is not clear how the core could be critical if xenon were zero.

Revise the definition for proposed TS 1.31 to clarify what conditions are used for the reference core or justify why no change is necessary. For example, "The reference core condition is the reactivity condition of the core when it is at 20 °C and the reactivity worth of xenon is zero (i.e., cold, clean, and critical)." to "The reference core condition is the reactivity condition of the core when it is at 20 °C and the reactivity worth of xenon is neglibile."

We have adopted the ANSI/ANS-15.1-2007 standard definition of Reference Core Condition with our definition of negligible. The definition now reads:
The reference core condition is the reactivity condition of the core when it is at 20 degrees C and the reactivity worth of xenon is negligible, $0.01 or less.

8.Revise the definition for proposed TS 1.32," that is either consistent with the guidance provided in ANSI/ANS-15.1-2007, Section 6.7.2, item (c)(iii) for the reporting of malfunctions in the reactor safety system, or explain why "discovered during maintenance tests" and "caused by maintenance" are equivalent and should share the same reporting exemption.
We have adopted the wording in ANSI/ANS-15.1-2007, Section 6.7.2 for our definition of Reportable Occurrence. The definition now reads:
Operation with a required reactor safety system component in an inoperative or failed condition which renders or could render the system incapable of performing its intended safety function. If the malfunction or condition is caused during maintenance, then no report is required;

We have updated item 4 to agree with ANSI/ANS-15.1-2007, Section 6.7.2
An unanticipated or uncontrolled change in reactivity greater than one dollar. Reactor trips resulting from a known cause are excluded;

To enhance our Technical Specifications, we have updated our definition of Secured Shutdown to read:
Secured shutdown is achieved when the reactor meets the requirements of the definition of "reactor secured" and the facility administrative requirements for leaving the facility with no licensed reactor operators present.

9.Revise the definition for proposed TS 1.39 to be consistent with that provided in the regulatory requirement 10 CFR 55.4 or justify why the no change is necessary.

We have adopted the ANSI/ANS-15.1-2007 standard definition of Senior Reactor Operator with the addition of licensed by the NRC. The definition now reads:
A senior reactor operator is an individual who is licensed by the NRC to direct the activities of reactor operators. Such an individual is also a reactor operator.

10. Revise proposed TS 1.41 or 1.42, as applicable, to correct the differences in these definitions for consistency, or justify why no change is necessary.

We have adopted the ANSI/ANS-15.1-2007 standard definition of Shutdown Margin. The definition now reads:
Shutdown margin is the minimum reactivity necessary to provide confidence that the reactor can be made subcritical by means of the control and safety systems starting from any permissible operating condition and with the most reactive rod in its most reactive position, and that the reactor will remain subcritical without further operator action.

11. Revise proposed TS 1.42 to provide a defined value for "ambient conditions," as found in the definition for reference core condition, or justify why no change is necessary.

We have updated our definitions to include the reference core in our definition of Shutdown Reactivity. The definition now reads:
Shutdown reactivity is the value of the reactivity of the reactor with all control rods in their least reactive position (e.g., inserted). The shutdown reactivity includes the reactivity value of all installed experiments plus the reactivity of the Reference Core Condition.

12. Revise proposed TS 2.2 to only describe the LSSS by removing the reference to the IFE location or justify why no change is necessary.

We have removed the reference to the IFE location in TS 2.2 and updated the definition of Standard Core to include the location. The definition now reads:

STANDARD CORE — A standard core is an arrangement of standard TRIGA fuel in the reactor grid plate and the IFE in grid position D8.