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U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Reference: U.S. Geological Survey TRIGA Reactor (GSTR), Docket 50-274, License R-113
Request for Additional Information (RAI) dated September 29, 2010

Subject: Response to Questions 22.1, 22.2, 25.1, 25.2, 25.3, 25.4 and 25.6 of the Referenced RAI

Mr. Wertz:

Our responses to Questions 22.1, 22.2, 25.1, 25.2, 25.3, 25.4 and 25.6 are provided on the following pages.

Our need for outside assistance to answer the detailed, technical RAI questions is being addressed by DOE contracting with the Colorado School of Mines (CSM). This is necessary because the USGS does not have the computer codes or the in-house expertise to perform the desired computer modeling analyses. The DOE has received a proposal from CSM and is processing that award at this time. The award is expected to be in place by the end of May, 2011, and it will include a project duration of one year. In addition to this DOE assistance, reactor staff at Oregon State University have offered to assist the CSM investigators with the initial modeling setup.

Sincerely,


Tim DeBey
USGS Reactor Supervisor

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

Executed on 5/12/11

Copy to:
Betty Adrian, Reactor Administrator, MS 975

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NRR

USGS Response to October, 2010 RAI Questions 22.1, 22.2, 25.1, 25.2, 25.3, 25.4 and 25.6.

Question 22

22. ANSI/ANS-15.1-2007, Section 3, "Limiting Conditions for Operation" identifies Limiting Conditions for Operations (LCO). The following items were noted in comparison to the GSTR TS LCOs:
- 22.1 ANSI-15.1-2007, Section 3.3 "Coolant Systems" recommends LCOs for requirements for leak or loss-of-coolant detection; and fission product activity detection. Specification 3 of LCO 14.3.3 does not employ the correct units ($\mu\text{mho/cm}$).
- 22.2 ANSI/ANS-15.1-2007, Section 3.8, "Experiments," establishes recommendations for reactivity limits and failures/malfunctions pertaining to experiments. GSTR TS LCO 14.3.8.1 does not employ the terminology "absolute value," as cited in the guidance. Please explain.

22.1 The Specifications for GSTR TS 14.3.3 "Reactor Primary Tank Water" point 3 will be changed to read the following:

3. The conductivity of the tank water shall be less than 5 umhos/cm when averaged over a one month period;

22.2 The Specifications for GSTR TS 14.3.8.1 "Reactivity limits" will be changed to read the following:

The reactor shall not be operated unless the following conditions governing experiments exist:

- 1. Movable experiments shall have absolute reactivity worth less than \$1.00;*
- 2. The absolute reactivity worth of any single secured experiment shall be less than \$3.00;*
- 3. Total absolute reactivity worth of all experiments shall be less than \$5.00.*

Question 25

25. ANSI/ANS-15.1-2007, Section 6, "Administrative Controls," provides information regarding content and format. Please provide additional information:

25.1 ANSI/ANS-15.1-2007, Section 6.1.3(1)(b) states that "A second designated person present at facility complex able to carry out prescribed instructions."

GSTR Administrative Control (AC) TS 14.6.1.3 1 (b) states, "A second facility staff person present or on call," which is a variance from the guidance.

25.2 ANSI/ANS-15.1-2007, Section 6.2.3, "Review Function" and Section 6.2.4, "Audit Function," provide guidance on the review and audit of specific areas. GSTR TS 14.6.2.3 "Review and Audit Function" does not state the review and audit functions. Please explain the deviation from the ANSI guidance.

25.3 ANSI/ANS-15.1-2007, Section 6.4, "Procedures," describes the content." However, GSTR Section 14.6.4 does not include the topic "use, receipt and transfer of by-product material, if appropriate."

25.4 ANSI/ANS-15.1-2007, Section 6.5 "Experiments Review and Approval" describes the requirements that should be included for the review and approval of experiments. The GSTR Section 14 does not include a section for the review and approval of experiments in its "Administrative Controls."

25.5 ANSI/ANS-15.1-2007, Section 6.6 "Required Actions" describes requirements pertaining to actions to be taken and circumstances when they apply. GSTR AC 14.6.5.1 specifies actions pertaining to safety system setting limit (should be LSSS) violations. However, the value cited was 1.0 MW, not 1.1 MW, or 100 kW depending on the core configuration as detailed in Section 14.2.2. Please explain.

25.6 ANSI/ANS-15.1-2007, Section 6.8.2, "Records to be retained for at least one certification cycle," requests that retraining and requalification of records for operators be maintained at all times the individual is employed or until the certification is renewed. Per 10 CFR Section 55.55(a) this period is 6 years. GSTR Administrative Controls Section 14.6.7.2 identifies the retention period as one training cycle but does not define this period in years.

25.1 No change shall be made to the verbiage contained in SAR 14.6.1.3. The terminology and requirements for our facility are more stringent than required by ANSI/ANS-15.1-2007. It is necessary for two significant reasons that a "facility staff person" and not a "designated person ...able to carry out prescribed instructions" be the one performing necessary tasks at this facility. Firstly, there are various layers of security personnel are required to negotiate to even access facility which no one but licensed reactor operators or senior reactor operators possess. Secondly, for the majority of tasks there is required training and/or licensing which is only practical for staff persons to attain.

25.2 GSTR TS 14.6.2.3 Review and Audit Function will be modified to include the following guidance from ANSI/ANS-15.1-2007 6.2.3 and 6.2.4 between sentence 1 and sentence 2 of GSTR TS 14.6.2.3:

The following items shall be reviewed:

1. *Determinations that proposed changes in equipment, systems, test, experiments, or procedures are allowed without prior authorization by the responsible authority, for example, 10 CFR 50.59 or 10 CFR 830;*
2. *All new procedures and major revisions thereto having safety significance, proposed changes in reactor facility equipment, or systems having safety significance;*
3. *All new experiments or classes of experiments that could affect reactivity or result in the release of radioactivity;*
4. *Proposed changes in technical specifications, license, or charter;*
5. *Violations of technical specifications, license, or charter. Violations of internal procedures or instructions having safety significance;*
6. *Operating abnormalities having safety significance;*
7. *Reportable occurrences listed in 14.6.6.2; and*
8. *Audit reports.*

A written report or minutes of the findings and recommendations of the review group shall be submitted to the Reactor Administrator and the review and audit group members in a timely manner after the review has been completed.

The audit function shall include selective (but comprehensive) examination of operating records, logs, and other documents. Discussions with cognizant personnel and observation of operations should be used also as appropriate. In no case shall the individual immediately responsible for the area perform an audit in that area. The following items shall be audited:

1. *Facility operations for conformance to the technical specifications and applicable license or charter conditions: at least once per calendar year (interval between audits not to exceed 15 months);*
2. *The retraining and requalification program for the operating staff: at least once every other calendar year (interval between audits not to exceed 30 months);*
3. *The results of action taken to correct those deficiencies that may occur in the reactor facility equipment, systems, structures, or methods of operations that affect reactor safety: at least once per calendar year (interval between audits not to exceed 15 months);*
4. *The reactor facility emergency plan and implementing procedures: at least once every other calendar year (interval between audits not to exceed 30 months).*

Deficiencies uncovered that affect reactor safety shall immediately be report to the Reactor Administrator. A written report of the findings of the audit shall be submitted to the Reactor Administrator and the review and audit group members within 3 months after the audit has been completed.

25.3 GSTR TS 14.6.4 "Procedures" will be modified to include guidance from ANSI/ANS-15.1-2007 6.4 such that an additional procedure topic will be added to read "10. Use, receipt and transfer of by-product material, if appropriate."

25.4 GSTR Section 10.3 “Experiment Review” will be moved verbatim to Chapter 14, such that it will be the new GSTR TS 14.6.5. All following sections will be renumbered accordingly.

25.5 To be answered with question 21 at a later date.

25.6 All instances of the term “training cycle” within GSTR TS Chapter 14 will be changed to “certification cycle.”