

June 12, 2014

Mr. Vito Nuccio
Reactor Administrator
Department of the Interior
U.S. Geological Survey
P.O. Box 25046 MS 406
Denver Federal Center
Denver, CO 80225-0046

SUBJECT: U.S. GEOLOGICAL SURVEY - REQUEST FOR ADDITIONAL INFORMATION
RE: LICENSE AMENDMENT REQUEST TO MODIFY THE SOURCE,
BYPRODUCT AND SPECIAL NUCLEAR MATERIAL POSSESSION LIMITS
FOR FACILITY OPERATING LICENSE NO. R-113 FOR THE U.S.
GEOLOGICAL SURVEY TRIGA REACTOR (TAC NO. ME9424)

Dear Mr. Nuccio:

By letter dated June 26, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12180A270), the U.S. Geological Survey (USGS, or the licensee) requested an amendment to the Facility Operating License No. R-113 for the USGS TRIGA Reactor (the facility) to modify the source, byproduct, and special nuclear material possession limits. The U.S. Nuclear Regulatory Commission (NRC) staff's review resulted in a request for additional information (RAI), provided by letter dated January 29, 2014 (ADAMS Accession No. ML13323B330). The USGS provided RAI responses by letter dated March 14, 2014 (ADAMS Accession No. ML14083A398).

Based on the NRC staff's review of the USGS RAI responses by letter dated March 14, 2014, additional clarifying information is needed. Please provide responses to the enclosed RAI within 30 days of the date of this letter.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.30(b), you must execute your response in a signed original document under oath or affirmation. Your response must be submitted in accordance with 10 CFR 50.4, "Written communications." Information included in your response that is considered sensitive or proprietary, that you seek to have withheld from the public, must be marked in accordance with 10 CFR 2.390, "Public inspections, exemptions, requests for withholding." Information related to security should be submitted in accordance with 10 CFR 73.21, "Protection of safeguards information: Performance requirements."

V. Nuccio

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If you have any questions regarding this review, or need additional time, please contact Geoffrey Wertz at (301) 415-0893 or by electronic mail at Geoffrey.Wertz@nrc.gov.

Sincerely,

/RA/

Alexander Adams, Jr., Chief
Research and Test Reactors Licensing Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-274

Enclosure:
RAI

cc: See next page

U.S. Geological Survey
cc:

Docket No. 50-274

Environmental Services
Manager
480 S. Allison Pkwy.
Lakewood, CO 80226

State of Colorado
Radiation Management Program
HMWM-RM-B2
4300 Cherry Creek Drive South
Denver, CO 80246

Mr. Timothy DeBey
Reactor Director
U.S. Geological Survey
Box 25046 - Mail Stop 424
Denver Federal Center
Denver, CO 80225

Test, Research, and Training
Reactor Newsletter
Universities of Florida
202 Nuclear Sciences Center
Gainesville, FL 32611

V. Nuccio

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Enclosure:
RAI

cc: See next page

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ADAMS Accession No.: ML14141A632 *concurred via email NRR-088

OFFICE	NRR/DPR/PRLB/PM*	NRR/DPR/PRLB/LA	NRR/DPR/PRLB/BC	NRR/DPR/PRLB/PM
NAME	GWertz	PBlechman	AAdams	(AAdams for) GWertz
DATE	05/22/2014	05/27/2014	06/12/2014	06/12/2014

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REQUEST FOR ADDITIONAL INFORMATION
REGARDING LICENSE AMENDMENT REQUEST FOR
U.S. GEOLOGICAL SURVEY TRIGA RESEARCH REACTOR
DOCKET NO. 50-274
LICENSE NO. R-113

By letter dated June 26, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12180A270), the U.S. Geological Survey (USGS, or the licensee) requested an amendment to the Facility Operating License No. R-113 for the USGS TRIGA Reactor (the facility) to modify the source, byproduct, and special nuclear material possession limits. The U.S. Nuclear Regulatory Commission (NRC) staff's review resulted in a request for additional information (RAI), provided by letter dated January 29, 2014 (ADAMS Accession No. ML13323B330). The USGS provided RAI responses by letter dated March 14, 2014 (ADAMS Accession No. ML14083A398). The NRC staff has reviewed the RAI responses and identified the following RAIs, which require additional information and clarification [the page numbers in brackets following each RAI below reference the March 14, 2014, USGS RAI response]:

The following questions pertain to the USGS RAI response: Proposed text of revised license [page 1]:

- 1) Proposed license condition 2.B (2) appears to indicate that a change is being requested in the enrichment specified in the current USGS license condition, 2.B (2). The current license condition 2.B (2) has a limit of 93 percent; whereas, the proposed license condition 2.B (2) states "of any enrichment." Indicate if the proposed license condition 2.B (2) in the RAI response is requesting a change to the enrichment of license condition 2.B (2), and, if so, provide a basis and justification for this proposed change.
- 2) Proposed license condition 2.B (3) appears to indicate an increase in the special nuclear material (SNM) mass limit of 2 grams is being requested. However, the response to RAI No. 7 indicated no increase in SNM was being proposed. Indicate if the proposed license condition 2.B (2) is requesting an increase in the SNM limit. If so, revise the response to RAI No. 7 accordingly, including your review of the effect of the increase on any USGS requirements, such as, the TSs, the security plan, etc.
- 3) Proposed license condition 2.B (3) appears to indicate that up to 2 grams of SNM may be irradiated in the USGS reactor in reactor based experiments. NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors," Part 1, Section 13.1.6, "Experiment Malfunction," and Part 2, Section 13, "Experiment Malfunction," provide guidance for evaluating the potential radiological consequences of an experimental malfunction involving SNM. The USGS RAI response did not provide a description of this type of experiment or a safety evaluation. Provide a description of the proposed license condition 2.B (3) SNM experiment and safety basis (analysis) using the guidance in NUREG-1537.

Enclosure

- 4) Proposed license condition 2.B (3) appears to indicate that up to 2 grams of SNM may be irradiated in the USGS reactor in reactor based experiments. NUREG-1537, Part 1, Appendix 14.1, Section 3.8.2, "Materials," indicates that technical specification limits should be placed on the maximum inventory of fission products. In USGS TS I, "Experiments," Specification 9, it provides radioactivity limits on the iodine and strontium inventory of each fueled experiment. The USGS response to RAI No. 10 indicated that no TS changes were needed as a result of this license amendment request. However, the relationship between the proposed license condition 2.B (3) allowing the irradiation of 2 grams of SNM and the current USGS TS I.9 on the radioactivity limits for iodine and strontium was not provided in the application. Provide an analysis that demonstrates that the maximum inventory of fission products proposed in license condition 2.B (3) is consistent with the USGS TS I.9, or propose a new or revised TS limit to ensure that the results of the analysis from RAI 3, above, are adequately stated in the USGS TSs.
- 5) Proposed license condition 2.C.1.c, provides the following: "(Note: following irradiation, if >99% of the radioactivity in the material has been produced in the GSTR, the byproduct material will then be considered to be entirely GSTR-produced.)" A similar statement is provided in proposed license condition 2.C.1.e. The purpose, basis, and justification for these notes are not provided in the application. Provide a purpose, basis, and justification for the proposed Notes in both license conditions 2.C.1.c, and 2.C.1.e.
- 6) The proposed USGS license conditions do not appear to include a license condition to account for special nuclear material produced by the operation of the reactor. Consider a new license condition, 2.B (4), worded as follows, "such special nuclear material as may be produced by the operation of the facility," or justify why this license condition is not needed.