

January 29, 2014

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

SUBJECT: U.S. GEOLOGICAL SURVEY - REQUEST FOR ADDITIONAL INFORMATION  
RE: AMENDMENT REQUEST TO INCREASE THE BYPRODUCT MATERIAL  
POSSESSION LIMIT 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 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).

The U.S. Nuclear Regulatory Commission staff is continuing to review your application for the amendment request regarding an increase to your byproduct material possession limit. During our review, questions have arisen for which we require additional clarifying information. Please provide responses to the enclosed request for additional information (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 Greg Schoenebeck at (301) 415-6345 or by electronic mail at [Greg.Schoenebeck@nrc.gov](mailto:Greg.Schoenebeck@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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Docket No. 50-274

Enclosure:  
RAI

cc: See next page

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GSchoenebeck, NRR

**ADAMS Accession No.: ML13323B380; \*concurred via email**

**NRR-106**

OFFICE	NRR/DPR/PRLB/PM	NRR/DPR/PRLB/LA	NRR/DPR/PRLB/PM*	NRR/DPR/PRLB/BC
NAME	GSchoenebeck	PBlechman	GWertz	AAdams
DATE	01/15/2014	01/15/2014	01/15/2014	01/29/2014

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**REQUEST FOR ADDITIONAL INFORMATION**  
**REGARDING AMENDMENT REQUEST**  
**TO INCREASE THE BYPRODUCT MATERIAL POSSESSION LIMIT**  
**THE U.S. GEOLOGICAL SURVEY**  
**THE U.S. GEOLOGICAL SURVEY TRIGA REACTOR**  
**LICENSE NO. R-113; DOCKET NO. 50-274**

By letter dated June 26, 2012 (Agencywide Documents Access and Management System Accession No. ML12180A270), the U.S. Geological Survey (USGS, or the licensee) requested an amendment to the Facility Operating License No. R-113, to increase the byproduct material possession limit for the USGS TRIGA Reactor (GSTR, or the facility). The U.S. Nuclear Regulatory Commission (NRC) staff has identified the following questions which require additional information and clarification:

**Questions Associated with Proposed License Condition Paragraph 2.C.1.c**

2. C. Pursuant to the Act and Title 10, Chapter 1, CFR [Code of Federal Regulations], Part 30 [10 CFR 30], "Rules of General Applicability to Licensing of Byproduct or Source Material", in support of the operation of the facility:

1. To receive, possess and use:
  - c. up to 10mCi [millicuries] of byproduct or source material that will be irradiated in the reactor after receipt;
- 1) Source material (as defined in 10 CFR 40, "Domestic Licensing of Source Material"), as provided in your proposed license condition, should be in a license condition pursuant to 10 CFR Part 40, not 10 CFR 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material." Provide proposed wording for your license that delineates materials consistent with the requirements of 10 CFR Parts 30 and 40.
- 2) NUREG-1537, Part 1 "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors, Format and Content," provides guidance that the applicant should specify the quantity of radionuclides produced by the reactor, or required to directly operate the reactor and associated experimental facilities authorized. Provide the basis for the proposed 10 mCi possession limit of the byproduct and/or source material that will be irradiated in the reactor after receipt.
- 3) NUREG-1537, Part 1 provides guidance that the applicant should specify the types (e.g., atomic numbers 3 through 83) of radionuclides authorized, as well as the general types of experiments or uses. Specify the types of byproduct and/or source material authorized for irradiation in the reactor after receipt (e.g., atomic numbers 3 through 83). Include a

Enclosure

discussion of the general types of experiments or uses in the reactor for the byproduct and/or source material.

Questions Associated with Proposed License Condition Paragraph 2.C.1.d

- d. byproduct or source material used in reactor-based experiments, calibration of radiation detectors, and reference sources for use in reactor-based analytic techniques;
- 4) Source material (as defined in 10 CFR 40), as provided in your proposed license condition, should be in a license condition pursuant to 10 CFR Part 40, not 10 CFR 30. Provide proposed wording for your license that delineates materials consistent with the requirements of 10 CFR Parts 30 and 40.
  - 5) NUREG-1537, Part 1 provides guidance that the applicant should specify the quantity of radionuclides produced by the reactor, or required to directly operate the reactor and associated experimental facilities authorized. Specify the quantity (i.e., possession limit) and provide the basis for the byproduct and/or source material to be used in reactor-based experiments, calibration of radiation detectors, and reference sources for use in reactor-based analytic techniques.
  - 6) NUREG-1537, Part 1 provides guidance that the applicant should specify the types (e.g., atomic numbers 3 through 83) of radionuclides authorized, as well as the general types of experiments or uses. Specify the types of byproduct and/or source material to be used in reactor-based experiments, calibration of radiation detectors, and reference sources for use in reactor-based analytic techniques.

Questions Associated with Proposed License Condition Paragraph 2.C.1.e

- e. up to 10 mCi of byproduct material contained in TRIGA (non-fuel) reactor parts and components received for use under R-113 from other TRIGA facilities;
- 7) During our review it was noted that there was no consideration made for any limitations of special nuclear material contained in irradiated TRIGA fuel received from other facilities that would ensure your special nuclear material limits are maintained within the definition given of 10 CFR 73, "Physical Protection of Plants and Materials," of special nuclear material (SNM) of low strategic significance and, therefore, within your current license and security plan. It is not clear what the intent is of this request.

Provide additional information that clarifies the nature of this request. Indicate if your request resolves conditions regarding possession of current TRIGA fuel at the facility, future receipt of spent TRIGA fuel, both, or other.

Propose wording pursuant to 10 CFR Part 70, "Domestic Licensing of Special Nuclear Materials" that places constraints on the receipt, possession, use, and non-separation of SNM contained in TRIGA elements received for use under R-113 from other TRIGA facilities.

Propose wording pursuant to 10 CFR Part 70 that places constraints on the produced possession, use, and non-separation of SNM in connection with the operation of the facility.

- 8) Provide the basis for 10 mCi of byproduct material contained in TRIGA (nonfuel) parts. How is this material accounted for when possessing used TRIGA elements from other facilities such that you would not violate a license condition upon receipt?

General Questions for Proposed License

- 9) 10 CFR 50.54(q) requires research reactor licensees to develop and implement an Emergency Plan; 10 CFR 73 requires research reactor licensees to develop and implement a Security Plan; and 10 CFR Part 20, "Standards for Protection Against Radiation," requires research reactor licensees to develop and implement a Radiation Protection Program. Indicate if any changes to the Emergency Plans, Security Plans, or Radiation Protection Program are necessary as a result of this license amendment request.
- 10) 10 CFR 50.36 requires research reactor licensees to develop technical specifications. Indicate if any changes to the GSTR technical specifications are necessary as a result of this license amendment request.
- 11) In your license amendment proposal you discuss the reason to "permanently transfer all licensed materials authorized by this amendment to the R-113 non-power reactor license", however clarification is required. Specifically, what licensing authority from the NRC Materials License No. 05-01399-08 are you trying to duplicate in your reactor license? For instance, what materials are specifically being transferred from the materials license to the reactor license? Are all the applicable license conditions for the materials license being transposed as license conditions on your reactor license? How are the conditions met through existing plans and procedures at the GSTR?