



Department of Mechanical Engineering

THE UNIVERSITY OF TEXAS AT AUSTIN

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December 18, 2012

U.S. Nuclear Regulatory Commission
Attn: Document Control
Washington, DC, 20555-0001

SUBJECT: Response to "THE UNIVERSITY OF TEXAS AT AUSTIN REQUEST FOR ADDITIONAL
INFORMATION, RE REQUESTED CHANGES TO THE FACILITY OPERATING LICENSE FOR THE
UNIVERSITY OF TEXAS AT AUSTIN (TAC NO ME8076) Docket 50-602

REF: The University of Texas at Austin Facility License R-129, Docket 50-602

Dear Ms. Torres:

This is a response to the Request for Additional Information dated November 29, 2012.

RAI 1.a:

For materials directly related to the operation of the facility, please discuss how you plan to use the materials that you are requesting to add to the license.

RESPONSE:

Previous correspondence identified which of the sources (i.e., materials as referenced above) are used in calibration of health physics instruments used to monitor radiological conditions at the facility. Sources are used for calibration of dose rate and contamination monitoring instruments. Typically, for dose rate calibrations, an instrument is exposed to a known field of radiation. A NIST traceable source is used to supply the known field of radiation. Depending on the type of instrument, different sources will be used. For a gamma survey instrument, Cs-137 and Co-60 are typical isotopes used for calibration. For a neutron survey instrument, Pu-239 (in the form of a PuBe neutron source) and Cf-252 are typical isotopes used for calibration. Instruments are exposed to the radiation fields in restricted areas such that personnel and public doses are maintained ALARA.

For contamination survey instruments, the instruments are typically exposed to a variety of radiation sources to determine instrument efficiency across a wide range of radiation energies. Examples of

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isotopes that may be used to cover a wide range of energies are C-14, Cl-36, Tc-99, Sr-90, Pm-147, Pb-210, etc.

In addition to survey instruments, analytical instruments such as high-purity germanium (HPGe) detectors are used to characterize unknown sources of radiation such as activation products. These analytical instruments are capable of providing energy and/or count rate information. Typically the detector is exposed to a variety of radiation sources to calibrate the energy scale across a wide range of energy. Examples of isotopes that may be used to cover a wide range of energies are Cr-51, Co-57, Co-60, Sr-85, Y-88, Cd-109, Sn-113, Cs-137, Ce-139, Pb-210, Am-241, etc. Once the detector has been "energy calibrated," it is then typically exposed to various radiation sources to determine efficiencies at specific energies or across an energy range. A wide-range efficiency calibration may be done using many of the same isotopes that are used for a wide-range energy calibration. Some efficiency calibrations are done for a specific isotope and thus a standard of that specific isotope is used. The specific isotope used as a standard depends on the specific isotope of interest and accounts for the vast array of isotopes requested to be added to the license.

RAI 1.b:

For materials directly related to the reactor research program, please discuss how you plan to use the materials that you are requesting to add to the license.

RESPONSE:

Previous correspondence identified which of the sources (i.e., materials as referenced above) are used in reactor research programs at the facility. Analytical instruments are used in the reactor research program in a variety of ways such as for neutron activation analysis. As with the instruments in support of operations, the analytical instruments undergo calibrations as described for analytical instruments in response 1.a. again accounting for the variety of isotopes requested to be added to the license.

In addition to calibration of analytical instruments, radioactive sources are used in research projects for irradiation of various materials. Depending on the specific requirements of the project, different isotopes are used. Some recent irradiation projects used Pu-238, Co-60, Cs-137, Cm-244, and Pu-239/Be. Irradiations are typically performed in a shielded area to maintain doses to personnel and the public ALARA.

As part of the mission of the facility is teaching, classes are conducted in areas such as radiochemistry and health physics. Various sources of radiation are used during these classes so that students may learn techniques in areas such as instrument calibration, shielding design, contamination control, etc. Again, depending on the particular situation, multiple different isotopes are used in these classes.

RAI 1.c:

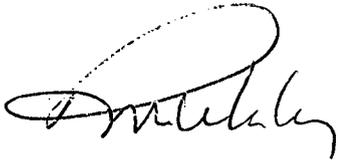
Please specify if the materials are going to be used as part of currently approved procedure or as part of an approved or planned experiment. Please identify which procedure(s) or experiments(s).

RESPONSE:

The materials requested all have uses under currently approved procedures and/or currently approved experiments. The currently approved procedures and experiments that use these materials are:

- HP-005 Radiation Monitoring Equipment
- HP-006 Radioactive Material Control
- MAIN-4 Area Radiation Monitor System
- EXP-B3.1 Neutron Activation Analysis
- EXP-A3.2 Beam Port 1, 2, and 4 Neutron Beam Experiments
- EXP-A3.3 Beam Port 3 and 5 Neutron Beam Experiments
- EXP-B6.0 Beam Port Sample Exposure

Please contact me by phone (512-232-5373) or email (whaley@mail.utexas.edu) if you require clarification or further information.



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The University of Texas at Austin
512-232-5373

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



Steven R. Biegalski
NETL Director