

UNIVERSITY *of* MISSOURI

ENVIRONMENTAL HEALTH AND SAFETY

February 19, 2016

U.S. Nuclear Regulatory Commission
Region III – Division of Nuclear Materials and Safety
Attn: Materials Inspection Branch
c/o Debora Piskura
2443 Warrenville Road
Lisle, Illinois 60532

Subject: Event No. 51673 – 30-Day Written Notification for Leaking Sealed Source

To whom it may concern:

Please accept this written notification for discovery of a radioactive device (foil) found to be leaking beyond acceptable levels under the reporting requirements of 10 CFR 30.50 (c) (2). Verbal notification of this leaking sealed source was provided to the NRC Operations Center on January 22, 2016 under Event No. 51673.

On January 19, 2016 at 10:28 am, a leak test was performed during a routine radiation safety inspection of W2061 Lafferre Hall; Columbia, MO 65211 and that test yielded approximately 0.03 μ Ci of removable contamination from the following source:

Isotope	Quantity	Reference Date	Chemical/Physical Form	Manufacturer	Model Number
Nickel-63	15 mCi	4/23/2005	Electroplated Nickel Foil	Eckert & Ziegler	NER-004

Immediate Corrective Actions

Upon discovery of the source leaking the University of Missouri (MU) Environmental Health and Safety (EHS) staff conducted an immediate follow-up re-inspection and survey of the immediate experiment area surrounding the source, other surfaces near the foil and on the floor below it to assess those areas for additional contamination. The contamination was initially determined to be confined to the work area on top of the table and the experiment itself. There was no evidence of contamination identified on the floor or personnel therefore we did not have concerns related to exposures to personnel and/or members of the public. The Radiation Safety Officer informed the authorizations permit holder and his radiation workers in person that the experiment was shut down until further notice, and had the work area and table covered with plastic sheeting to prevent the spread of contamination until further investigations of the details of the incident could occur and a careful decontamination plan could be developed under a Radiation Work Permit (RWP).



8 Research Park Dev Bldg, Columbia, MO 65211 Phone: 573-882-7018 Fax: 573-882-7940 ehs.missouri.edu

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Probable Cause

After interviews with research staff and a review of the sealed source device registry certificate, it is suspected that the source was damaged during handling and use as a novel energy source for nuclear battery research and possibly during leak testing activities on the Jan 19, 2016. Furthermore it was identified during the investigation that the experiment was not conducted in a glove box, even though the condition of approval of the application for the use of the Ni-63 required it to be used in a Glove Box. For clarification the experiment was conducted in an approved and permitted radioactive material use laboratory but the removable contamination levels on the laboratory table was not acceptable per our contamination guidelines of our Radiation Safety Manual (RSM) and the identified leakage from the Ni-63 foil was beyond acceptable limits.

Additional Corrective Actions

On January 29, 2016, after additional research, reporting of the event to the NRC and development of a RWP to conduct a controlled investigations and incremental decontamination of the table MU EHS staff returned to W2061 Lafferre Hall to first safely remove the Ni-63 source and associated equipment and place them in the laboratory's glovebox and then perform additional surveys in support of decontamination effort. Those surveys indicated that the contamination was not just limited to the experiment area but other portions the table as well as several items on the table. Again no contamination was found on any floors or persons. The full decontamination of the table was completed on February 5, 2015.

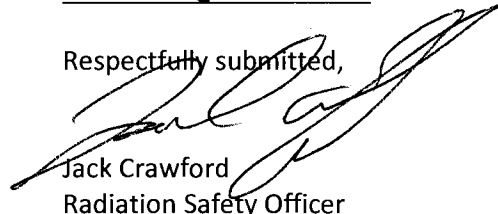
The laboratory was issued a violation (in accordance with our RSM), the suspension was extended until further notice, and the authorized user was required to attend the Radiation Safety Committee (RSC) meeting on February 11, 2016 to discuss root cause and corrective actions.

Actions to Prevent Reoccurrence

Following the RSC acceptance of appropriate corrective actions to prevent re-occurrence all future research with the Ni-63 source will be done inside the glove box and the experiment and handling methodology will be modified to prevent future damage to the new source. Additionally all future leak testing will be performed in a manner so as to ensure that the active surface of the source is not disturbed.

If you have any questions or concerns, please contact me at (573) 882-7018 or crawfordw@missouri.edu.

Respectfully submitted,



Jack Crawford
Radiation Safety Officer

License No. 24-00513-32

cc: S. Jurisson (MU Professor of Chemistry and Chair of RSC)
G. Ward (MU Vice Chancellor of Operations)
T. Houts (MU EHS Director)
S. Engelhardt (Engelhardt and Associates)
RSO File

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