

Nuclear Reactor Laboratory
Engineering Building (20)
P. O. Box 210020
Tucson, Arizona 85721-0020

THE UNIVERSITY OF
ARIZONA
TUCSON ARIZONA

John G. Williams, Director
e-mail: jgw@enr.arizona.edu
voice (520) 621-9729
FAX (520) 621-8096

Date: 25 August, 2000

To: U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mailstop P1-37
1 White Flint North
11555 Rockville Pike
Rockville, MD 20852

From: John G. Williams, Director,
Nuclear Reactor Laboratory,
University of Arizona,
Tucson, AZ 85721-0020



Re: Technical Specifications required written report, transmitted within thirty days;
Facility License R-52, Docket 50-113. This item is concerning Tech. Specs. 6.7 c.4.

Technical Specifications (Amendment 17, as approved on December 18, 1997) for Facility License R-52, the University of Arizona, requires in section 6.7 c.4 a written report to the Commission of, "Any observed inadequacies in the implementation of administrative or procedural controls." This report fulfills that requirement in the case of a discovered deficiency in reporting of routine health physics surveillance.

Description of the Occurrence

On the afternoon of July 18, 2000, a routine contamination survey was performed at the Nuclear Reactor Laboratory (NRL), University of Arizona by staff of the Radiation Control Office (RCO). On July 26, at approximately 0845, the Reactor Supervisor received word that four out of 26 wipe samples showed contamination, with the highest count rate about 1100 counts per minute. Subsequently, he was told that I-131 (8-day half life) was identified by gamma spectrometry.

Immediate surveys of the Reactor Laboratory and reviews of records showed no confirmatory evidence, which should have been found if the reported contamination was genuine. The continuous air monitor showed no indication. The area monitors showed no indication. The reactor pool water monitor showed no unusual radioactivity. Self-reading personnel dosimeters worn by visitors to the NRL on 7/18/00 showed no indication. Finally, no indication of I-131 could be found in the laboratory on July 26, even though no clean-up had been attempted up to that time.

The report we received from RCO has been shown to be incorrect. This report documents the basis for this conclusion, and steps taken to prevent a recurrence.

Assessment Actions and Results

In addition to the surveys and analysis of records at the NRL, additional assessment actions were performed at the Radiation Control Office. The following results were found.

1. Recounting on 7/27/00 and analysis using liquid scintillation counting of the 26 wipe samples collected on 7/18/00 showed that 4 of the 26 showed activity above the internal reporting level of 100 DPM/100cm². One of these, collected from the top of a lead brick cave used for short term sample storage, showed 3824 DPM/100cm², and the other three showed activity between 200 and 300 DPM/100cm².
2. No gamma activity could be found in these samples using gamma spectrometry. In addition, no beta or gamma activity had been observed using a G-M probe to survey the original wipes. The original report of I-131 activity was proved to have been due to contamination of this isotope on the gamma spectrometer used at RCO. Efforts to identify the isotope responsible for the observed liquid scintillation counts proved inconclusive. The origin of the activity is therefore unknown, and may possibly have not been at the NRL.
3. Four additional sets of samples collected from the same areas in the NRL on 7/26 and 7/27 showed no activity above background when counted on the same liquid scintillation counter as the first set. Of these four sets, the first was collected prior to any clean-up attempt, and the remaining three were collected after the areas had been scrubbed. Negative results from these samples proved that no widespread contamination could have existed in the NRL at the time of the original sampling. If some activity was present, it must have been an isolated spot on the lead cave, which could have cross-contaminated other samples in the original set.
4. Bioassay was performed on J. Williams and H. Doane, who had been present in the NRL during the operations on 7/18/00. On 7/27/00, both supplied urine samples, in which no activity above detection limits was found, and J. Williams was also assayed for thyroid activity also with negative results. Other persons present in the lab were not assayed, but none entered areas not also entered by Williams or Doane. No person approached the vicinity of the lead cave mentioned previously.

The conclusions resulting from these assessment activities are that no I-131 activity was present in the NRL, and no extensive contamination was present of any other isotope. It is probable that an isolated spot of a low-energy beta emitter caused the original counts. Whether this was actually present in the Nuclear Reactor Laboratory, or was subsequently introduced into the samples accidentally, cannot be proved. In either case the amount of activity was small, and not sufficient to represent any threat to health and safety, or to result in any violation of 10CFR Part 20 limits.

Possible Consequences

There was no safety implication found in this incident. Incorrect reporting of suspected contamination could have caused unnecessary concern and stress to persons hypothetically exposed. Timely evaluation leading to the conclusion that no exposures had in fact occurred prevented this outcome.

No threat to public health and safety occurred. There was no violation of Federal Regulations, Safety Limits, Limiting Safety System Settings, or Limiting Conditions for Operation.

The only items of concern arising from this incident relate to deficiencies found in training and procedures that resulted in promulgation of misleading information. Remedial actions addressing these will be listed below.

Cause of the Occurrence

The incident was not caused by any loss of control of radioactive material at the NRL.

Misleading information was generated and promulgated because of several circumstances:

1. The Health Physicist who usually analyzes and reports results from Reactor Laboratory wipe samples was on leave. In his absence, a Radiation Control Specialist who was inexperienced in some aspects of the analysis and reporting performed his functions.
2. The results reported by the Radiation Control Specialist to the NRL staff were not initially reviewed by a qualified Health Physicist at the RCO.
3. NRL staff did not communicate immediately with a qualified Health Physicist at the RCO, in order to confirm the information and its interpretation.
4. Possible cross-contamination of samples collected at the NRL was not prevented by the use of individual isolated containment of the samples.
5. The high-resolution gamma spectrometer used at the RCO was slightly contaminated with gamma activity from an unknown source. A standard prepared at RCO a few days before may have been the source.

Remedial Actions

The following remedial actions have been implemented at the RCO:

1. A protective cover will always be used on the gamma spectrometer, to prevent contamination of the detector.
2. Routine wipe surveys at the RCO will in future include a survey point on the gamma spectrometer.
3. Wipe samples collected from the NRL will in future be enclosed in individual containment.
4. Wipe samples from the NRL will in future be counted within 24 hours of their collection.
5. A Health Physicist at the RCO will always review counting data prior to the release of results.
6. In the case of suspected contamination, a repeat survey will be immediately performed.

The following remedial action has been implemented at the NRL:

1. Procedure number UARR 146 has been revised to require that NRL staff should contact a qualified Health Physicist at the RCO in the event of receiving evidence of suspected contamination, prior to initiating other action.

These actions have been discussed with the Chairman of the Reactor Committee, and will be reported to the Reactor Committee for review at their next scheduled meeting on 9/06/00.

I believe that these actions will prevent a recurrence of any similar incident.



J. G. Williams, Director, Nuclear Reactor Laboratory

copies to:

**Events Assessment, Generic Communications and
Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738**

**The V.P. for Research, University of Arizona
Richard C. Powell**

**The Director of the Arizona Research Laboratories
Michael A. Cusanovich**

Members of the Reactor Committee

**The Reactor Supervisor
Harry J. Doane**

**The Director of the Radiation Control Office
Melvin C. Young**