IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

College of Engineering
Department of Mechanical Engineering
2025 H. M. Black Engineering Building
Ames, Iowa 50011-2161
515 294-1423
FAX 515 294-3261
http://www.eng.iastate.edu/me

January 18, 2001

Docket No. 50-116

U.S. Nuclear Regulatory Commission
Attn: Al Adams
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Subject: Iowa State University UTR-10 Reactor Decommissioning

Dear Mr. Adams:

Please find enclosed two copies of the corrected page 1 from the Final Status Survey report and a memo regarding elevated radiation levels found during the ORISE confirmatory survey in September. They were requested by Mr. Ted Michaels in December.

If you have any questions please contact me at (515) 294-0539.

Sincerely,

Scott E. Wendt
Reactor Manager

Enclosures (2)

A020

Iowa State University

To: Daniel B. Bullen, Facility Director, Iowa State University

From: Scott E. Wendt, Reactor Manager, Iowa State University

Ken Kerns, Radiation Safety Officer, Iowa State University

CC:

Date: January 18, 2000

Re: UTR-10 Reactor Decommissioning

During the ORISE confirmatory surveys there were some areas identified with elevated radiation levels and some areas with direct readings that exceeded the DCGL. These areas were not associated with the UTR-10 Reactor, but rather are from operations licensed under the Iowa State University's Materials License (0014-2-85-AAB) issued by the Iowa Department of Public Health. An explanation of the findings follows:

Radiation levels in rooms 201 and 101 NEL were identified as having elevated radiation levels. This is consistent with the radioisotopes stored in the two rooms.

Room 101 houses a 2.8 Ci Cs-137 sealed source used to calibrate the University's radiation detection equipment. In addition there are two PuBe sources also stored in this room. Radiation surveys conduced by EH&S in this room prior to installing the calibration range indicated that radiation levels were equal to background.

Room 201 is the hot laboratory used by the University's Health Physics staff to survey packages of radioactive material upon receipt. The types and amounts of radioactive material in the room vary daily. There are also radiation standards stored in room 201 that contributes to the radiation levels in the room. Finally, this room is also used to store all volatile I-125 sources used for iodination of proteins. Although these collective isotopes do result in elevated radiation levels, the levels are well below the limits established by state regulations and the ISU Radiation Safety Manual. The radiation levels in the spaces adjacent to room 201 are all below the limits established for the general public.

The areas identified to have higher activity than the DGCL are not the result of any operation involving the UTR-10 reactor. There were three general areas identified to have elevated activities using proportional counters or solid state detectors.

Room 114 has two areas that exceed the DGCL when looking at the gross beta counts. *In Situ* gamma spectroscopy of these areas indicated that there was not a prevalent gamma emitter and no alpha decay was identified. The elevated readings appear to result from structural components in the cement floor. The elevated readings correspond to areas in the cement floor that are visibly different from the original floor. These areas are thought

to be patches for a floor drain system that was installed after the original construction of the building.

One small area of elevated activity was identified outside the door of 101 NEL. The ISU Health Physics staff attempted to collect a sample from this area for radiological analysis. The mechanical removal of the top .5 cm of this area had effectively removed the contaminant. The sample was identified as a natural mix of radio-thorium, perhaps from welding rods (this is supported by the discoloration of the cement). The spot outside of room 101 has been effectively decontaminated and now reflects background levels.

The elevated readings in room 101 are similar to those in room 114 and are most likely from the construction materials used.

The findings of the surveys have been noted by the Radiation Safety Officer and have been filed with the individual room records. These rooms fall under the University's Broadscope Material License and are actively used for radiation work. There is no immediate plan to decommission the Nuclear Engineering Building. When the building is no longer used for work involving radioactive material, these areas of elevated activity and radiation levels will be addressed in the decommissioning process. The Radiation Safety Officer has determined that these areas do not pose a significant risk to the building occupants and any further remediation activities are not warranted until the building is decommissioned.

For informational purposes, a copy of the memo will be sent to the US Nuclear Regulatory Commission. If you have any questions, please contact Scott Wendt at (515) 294-0539 or Ken Kerns at 294-0746.

1.0 INTRODUCTION

This document describes the results of the final status survey performed by Duke Engineering & Services (DE&S) to demonstrate that radiation and radioactive contamination levels at the Iowa State University (ISU) UTR-10 Reactor have been reduced to levels below criteria established for unrestricted use.

The final status survey was conducted in accordance with a plan and implementing procedures derived from regulatory guidance, specifically NUREG-1575 "Multi-Agency Radiation Survey and Site Investigation Manual" (MARSSIM). DE&S employed a graded approach in designing the final status survey. This type of approach to data collection placed the greatest survey efforts on areas that have, or had, the highest potential for residual radioactivity and demonstrates that all radiological parameters do not exceed the established release criteria

The plan provided specific instructions for the performance of the final status survey including the survey measurement type, frequency and location within each survey unit. Survey/Sampling Work Plans (SSWP) were provided as Appendix A of the plan. Each SSWP contained a FSS General Instructions Form (DD-FS-300-1), a FSS Survey Location Designation, Results and Comment Form (DD-FS-300-2) and all necessary Final Status Survey Maps (DD-FS-300-3).

2.0 BACKGROUND INFORMATION ON REACTOR FACILITY

The UTR-10 was housed in the Nuclear Engineering Laboratory (NEL) building located on the west edge of the main campus of ISU, in Ames, Iowa. The facility is a two-story, three-level building of brick construction built in 1934 by the U.S. Department of Agriculture. It was deeded to the University in 1946. A map indicating the location of the University with respect to Ames and major highways is shown in Figure 2.1. The location of the NEL building within the ISU campus is shown in Figure 2.2.

The building floor space is divided into four levels: the basement (west side only), the ground floor (which includes the central bay), the first floor (west side only) and the second floor which surrounds the central bay. The central bay is approximately 34 feet high and has a floor area of 37 feet by 56 feet, of which a space approximately 37 feet by 38 feet is allocated to the reactor room. The reactor room houses the reactor, which is enclosed in a concrete biological shield, the process pit, the fuel storage pit, and a five-ton bridge crane. The facility layout is shown in Figure 1.3.

The UTR-10 was an Argonaut reactor which used enriched uranium in a graphite reflected, water moderated core. The reactor was installed in 1959 on the ground floor level, central bay area, of the NEL. In 1991 the reactor fuel was changed from its original high-enrichment uranium to low-enrichment uranium. The reactor was controlled with four window-shade type Boral control rods. Heat from fission was removed from the primary coolant by a 34,000 BTU/hr shell-and-tube heat exchanger that utilized city water as a heat sink. The reactor was designed to be inherently safe. It would automatically shut down if there was a loss of AC power or if parameters important to safety were exceeded.

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