

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

NRC Inspection Report: 50-148/90-01 License: R-78

Docket: 50-148

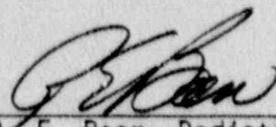
Licensee: The University of Kansas (KU)  
Lawrence, Kansas 66045-2223

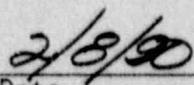
Facility Name: Nuclear Reactor Center  
(Defueled Bendix Pool Type Reactor)

Inspection At: Nuclear Reactor Center  
(Burt Hall), KU

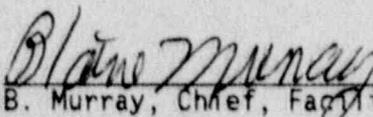
Inspection Conducted: January 19, 1990

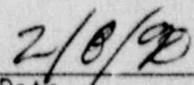
Inspector:

  
\_\_\_\_\_  
R. E. Baer, Radiation Protection Specialist  
Facilities Radiological Protection Section

  
\_\_\_\_\_  
Date

Approved:

  
\_\_\_\_\_  
B. Murray, Chief, Facilities Radiological  
Protection Section

  
\_\_\_\_\_  
Date

Inspection Summary

Inspection Conducted January 19, 1990 (Report 50-148/90-01)

Areas Inspected: Nonroutine, announced inspection of the reactor facilities to confirm the radiological conditions documented during the licensee's October 16, 1989, survey. The inspector used the guidance provided in NRC Inspection Procedure 83890 in the performance of the confirmatory radiological surveys.

Results: The licensee had removed all equipment from the southeast and southwest corners of the lower floor of the nuclear reactor building and performed an initial survey on October 16, 1989. A confirmatory radiological survey conducted by the inspector verified that the facility met the guidance in NRC Regulatory Guide 1.86 for release of these areas for unrestricted use.

DETAILS

1. Persons Contacted

\*H. F. Rosson, Reactor Director

\*M. R. Lemon, Assistant Radiation Safety Officer

\*Indicates those individuals present at the exit interview on January 19, 1990.

2. Class II Operation and Procedures (40750)

a. Background

The KU reactor had been defueled and is awaiting a final decommissioning plan. The reactor status had been previously discussed in NRC Inspection Reports 50-148/86-01 and 50-148/89-01.

The licensee had in October 1989 surveyed the reactor control center (southeast) and demineralizer and storage pool (southwest) areas located on the lower floor of the nuclear reactor building. Figure 1 depicts the area locations. The licensee requested through Office of Nuclear Reactor Regulation (NRR) on November 15, 1989, that an NRC confirmation survey be made to avoid potential problems at the time of final decommissioning about the radiological status of these areas as they plan to place a new concrete floor and retention curb over the existing floor and construct a storage facility for low-level and mixed radioactive waste.

b. Release Criteria for Unrestricted Use

The radiation levels for release of a reactor facility for unrestricted use must be reduced to levels consistent with Table 1 of Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors." In addition, external exposure rates must be less than 5 micro Roentgens per hour (uR/h) above natural background at 1 meter from the measured surfaces or that no person will receive more than 10 mrem/year. Natural background has been defined as radiation from naturally occurring radioisotopes as measured at a comparable uncontaminated structure or exterior soil surface.

The inspector used Regulatory Guide 1.86 criteria as a basis for comparison of the confirmatory survey with the understanding that the area will not be released for unrestricted use at this time, but rather for the storage of low level and mixed radioactive waste.

c. Independent Confirmatory Measurements

The inspector performed a verification survey of the areas depicted in Figure 1 of the nuclear reactor building. This survey was performed to independently verify the radiological status of the area. The radiological surveys performed included direct measurements of beta and gamma radiation levels. Measurements of removable (transferable) and nonremovable alpha and beta contamination were also made. All components except the aluminum storage pool liner had been removed from these areas.

The inspector determined that the general background direct gamma radiation levels associated with the facility were 7 to 10 uR/h inside the storage pool liner and 10 to 14 uR/h on the operating floor level. The inspector also verified that the maximum residual gamma radiation levels were not greater than the general background levels. No localized "hot spots" were identified. In addition to gamma measurements, the inspector also performed surveys to identify fixed beta radiation levels. One small area, less than 100 square centimeters (100 cm<sup>2</sup>) was identified where radiation levels were approximately 350 counts per minute above background. This area was decontaminated to background levels before the inspector left the facility.

The inspector performed surveys to identify removable alpha and beta contamination using conventional paper smear techniques. Smear surveys were taken over a nominal 100 cm<sup>2</sup> and analyzed for alpha and beta radioactivity. No removable radioactive contamination levels above background levels were identified.

Instrumentation used are documented in the attachment to this report.

No violations or deviations were identified.

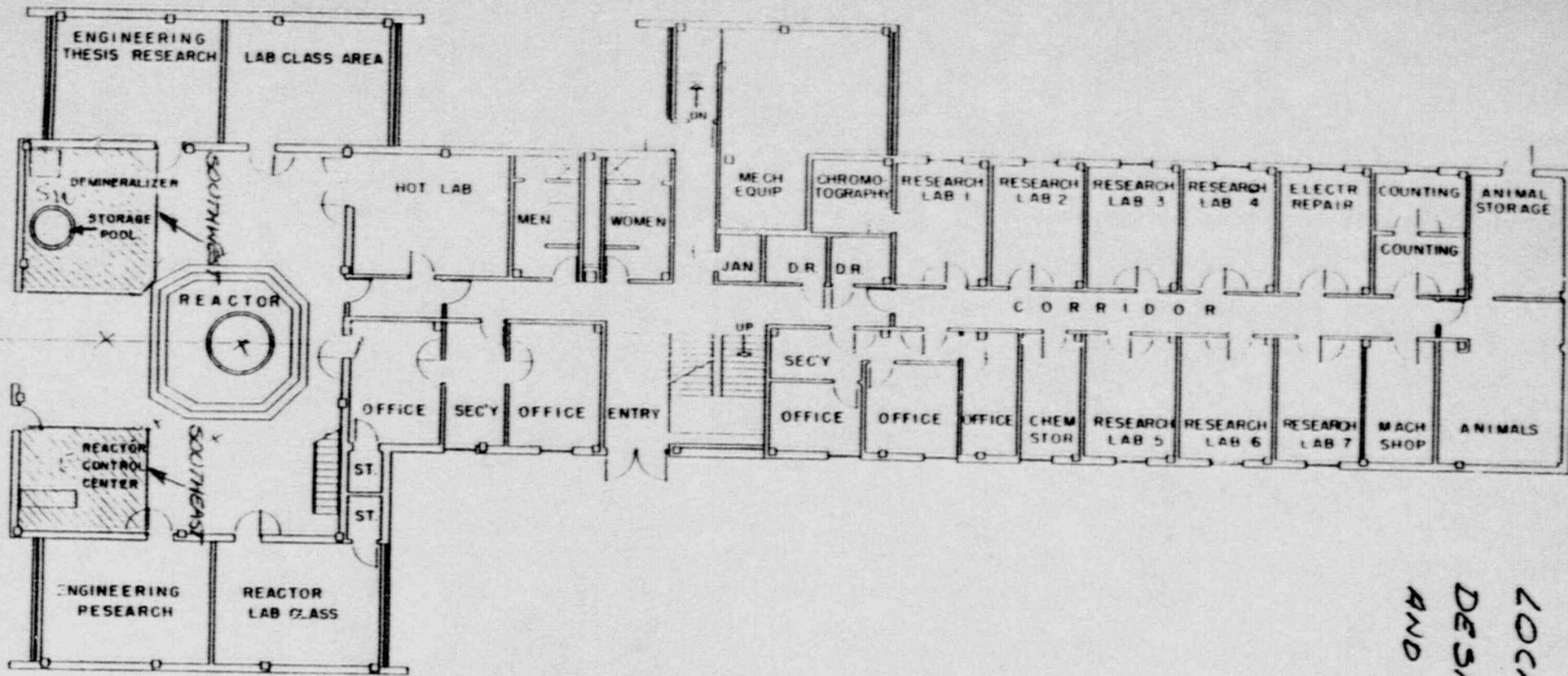
3. Exit Interview

The inspector met with the licensee representatives denoted in paragraph 1 of this report at the conclusion of the inspection on January 19, 1990. The inspector summarized the inspection findings and verification survey results. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector during the inspection.

ATTACHMENT

<u>Instrumentation Portable Survey Meters Model</u>	<u>NRC Identification Number</u>
Ludlum Model 19 Micro R Meter	015545
Xetex Model 305B	011601
Technical Associates Model TBM-3S	018662

<u>Laboratory Counters Model</u>	<u>NRC Identification Number</u>
Eberline Model DC-4 Beta Counter (Eff. = 16%)	014812
Eberline Model 9AC-4 Scintillation Alpha Counter (Eff. = 27%)	012831



NUCLEAR REACTOR BUILDING  
 LOWER FLOOR PLAN  
 UNIVERSITY OF KANSAS

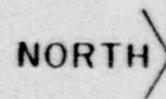


FIGURE 1  
 LOCATION OF AREAS  
 DESIGNATED "SOUTHWEST"  
 AND "SOUTHEAST" SURVEYED