U. S. NUCLEAR REGULATORY COMMISSION

REGION II

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License No.:	45-09599-03
Report No.:	45-09599-03/96-01
Licensee:	Old Dominion University
Locations:	1300 West 49th Street Norfolk, Virginia
Date:	September 10 - 11, 1996
Inspectors:	Bryan A. Parker, Radiation Specialist John M. Pelchat, Health Physicist
Approved by:	Charles M. Hosey, Chief Materials Licensing/Inspection Branch 1 Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

Old Dominion University

NRC Inspection Report No. 45-09599-03/96-01

This routine, unannounced inspection was conducted to evaluate the licensee's radioactive materials program. This included discussions with cognizant licensee representatives, reviews of documents, and direct observations of activities associated with the Radiation Safety Committee, organization and scope of licensee program, facilities, equipment and instrumentation, training, area radiation surveys and contamination control, personnel radiation protection, radioactive waste management and transportation.

In general, the inspectors found the licensee's program to be implemented and maintained well in all areas. Radiation safety staff was knowledgeable and conscientious. The licensee's audit function performed well and no major incidents had occurred. All records reviewed were well organized and up-to-date. Overall, the licensee's program was functioning satisfactorily. No violations were identified.

LIST OF PERSONS CONTACTED

Licensee

*P. Sutcliffe, Radiation Safety Officer
*R. DeMunda, Associate Director of Environmental Health and Safety
*K. Blow, Director, Office of Risk Management
*R. Fenning, Associate Vice President for Administration and Finance

*Attended September 11, 1996, Exit Meeting

In addition, various authorized users, laboratory, and ancillary staff were interviewed during laboratory tours.

REPORT DETAILS

01. Organization and Scope of the Licensee Program (87100)

License Condition No. 26 requires that the licensee conduct its program in accordance with the statements, representations, and procedures contained in the certain referenced documents. Item 7 of referenced application dated May 23, 1995, describes the licensee's organizational structure.

License Condition No. 12 specifies by name the licensee's Radiation Safety Officer (RSO).

The inspectors reviewed and discussed with licensee representatives the organization and program activities associated with the NRC broad scope license. From those discussions and reviews, the inspectors noted that the licensee utilizes licensed material for a wide variety of research activities. At the time of the inspection, the licensee had 13 authorized users, that oversaw the use of radioactive material by approximately 50 qualified users total. Each authorized user had assigned an individual within each laboratory that was responsible for radiation safety related activities. The authorized users conducted research utilizing microcurie to millicurie amounts of various radioisotopes in different forms, including carbon-14, hydrogen-3, and iodine-125.

The licensee maintained eight authorized places of use that consisted of office/research facilities which were located on the licensee's campus in Norfolk and the Oceanography Building located at 1054 47th Street, Norfolk, Virginia. No other facilities or temporary job sites were used for licensed activities. The licensee was authorized to conduct licensed activities aboard research vessels. At the time of inspection, no licensed materials were in use or storage aboard research vessels.

The licensee had a Radiation Safety office that maintained oversight of all radiation safety activities at the licensee's facility. The Radiation Safety office was responsible for conducting audits of users of radioactive material, order validation, receiving and inventorying radioactive material, conducting and maintaining survey instrument calibrations, leak testing sealed sources, and radioactive waste management. The Radiation Safety staff consisted of two full-time employees, the RSO, and a Radiation Safety Technician. The RSO reported to the Associate Director for Environmental Health and Safety.

02. Management Oversight (87100)

02.1 Radiation Safety Committee

The application dated May 23, 1995, referenced in License Condition No. 26, describes the Radiation Safety Committee (RSC) membership, and its duties and responsibilities.

License Condition No. 11 specifies by name the Chairperson of the licensee's RSC.

The inspectors discussed the role of the RSC with licensee representatives and reviewed RSC meeting minutes for 1994, 1995 and to date in 1996. From those discussions and reviews, the inspectors determined that the RSC had met quarterly since the last inspection conducted on July 7, 1994. The RSC met with a quorum, and membership included representatives from all research departments using licensed radioactive materials. The RSC Chairperson was Scott Sechrist, who was an authorized user. The RSC reviewed personnel radiation exposures, radiation safety audits, approved users, and other radiation related activities associated with the licensee's facilities. Based on those discussions and reviews, the inspectors concluded that the licensee's RSC was adequately reviewing those radiation safety activities associated with the licensee's NRC byproduct materials license to ensure regulatory compliance.

02.2 Audits and Reviews

The application dated May 23, 1995, referenced in License Condition No. 26, describes the licensee's auditing procedures.

Through discussions with cognizant licensee representatives and a review of radiation safety audit records from July 7, 1994, to the date of the inspection, the inspectors determined that the licensee's Radiation Safety office conducted audits of all laboratories once per calendar quarter. The inspectors noted that material security, training, surveys, and independent measurements were included in the quarterly audits. The inspectors found the auditors to be knowledgeable in radiation safety practices and the licensee's NRC license and regulatory requirements. The inspectors reviewed selected audit records and noted that they contained substantive findings and comments. Appropriate corrective action of identified deficiencies was taken as needed. The inspectors found that the licensee was conducting comprehensive audits of authorized users and identifying and correcting items of significance relative to the activities conducted by the licensee under their NRC byproduct materials license.

The inspectors also noted that the licensee contracted with an outside radiation safety consultant to perform independent audits of the radiation safety program annually. The 1994 and 1995 reports were reviewed during the inspection. Reports documented a comprehensive review of the licensee's activities and provided suggested programmatic improvements. No significant safety issues were identified by these audits.

03. Facilities (87100)

10 CFR 20.1801 requires that the licensee secure from unauthorized removal or access licensed materials that are stored in unrestricted areas. 10 CFR 20.1802 requires that the licensee control and maintain

constant surveillance of licensed material that is in an unrestricted area and that is not in storage.

The inspectors noted that the licensee maintained 11 research laboratories at various locations at the licensee's facilities. During the inspection, the inspectors randomly toured and inspected seven laboratories and discussed research activities associated with each of those laboratories. From reviews and discussions with the licensee, the inspectors determined contamination surveys, inventory, and waste management practices had been adequately maintained for those laboratories. In addition to those laboratories, the inspectors randomly checked other laboratory doors for security and identified no unsecured material. Based on licensee discussions and direct observations, the inspectors concluded that the facilities observed during the inspection were the same as those described in the licensee's NRC license and application material. In addition, the inspectors found the facilities to be adequate for conducting those activities authorized by the license.

04. Equipment and Instrumentation (87100)

The application dated May 23, 1995, and letter dated November 8, 1995, referenced in License Condition No. 26, describe the licensee's instrument calibration requirements.

The inspectors reviewed selected instrument calibration records since the previous inspection and discussed the licensee's methods with the RSO. The inspectors noted that the licensee sent their survey instruments to a licensed outside vendor, usually the instrument manufacturer, for calibration once per year. The license possessed sufficient numbers and types of instruments to adequately cover licensed activities. No concerns were noted with the licensee's methods or procedures regarding instrumentation.

05. Training, Retraining, and Instructions to Workers (87100)

The application dated May 23, 1995, and a letter dated November 8, 1995, referenced in License Condition No. 26, describe the licensee's training program and requirements.

During the inspection, the inspectors discussed with cognizant licensee representatives radiation safety training given to licensee personnel and reviewed those topics discussed. From those reviews and discussions with cognizant licensee personnel, the inspectors noted that the licensee conducted training for research personnel who handled and used radioactive material to include good radiation safety practices and precautions, use of protective equipment and dosimetry, and updates in radiation safety and events. An introductory seven hour course with a test was offered quarterly or on an "as needed" basis for new authorized and qualified users.

The inspectors discussed training with users during laboratory tours and noted no concerns. Engineering, maintenance and other ancillary personnel were trained as part of new employee orientation, and on an as needed basis, based on the particular circumstance. From those reviews and discussions with licensee personnel, the inspectors determined that the licensee was adequately instructing personnel in radiation safety and those activities associated with the NRC byproduct material license in accordance with NRC regulatory requirements.

In addition to initial radiation safety training, the licensee provided annual refresher training in the form of lectures and video presentations for employees working with or in the vicinity of licensed materials. From those reviews and discussions with licensee personnel, the inspector determined that the licensee was adequately instructing personnel in radiation safety and those activities associated with the NRC byproduct material license in accordance with NRC regulatory requirements.

06. Area Radiation Surveys and Contamination Control (87100)

The application dated May 23, 1995, referenced in License Condition No. 26, describes the licensee's survey and monitoring requirements.

The inspectors reviewed area radiation detection survey records conducted from July 7, 1994, to the date of the inspection for research and radiation safety activities, and discussed those records with cognizant licensee representatives. The inspectors noted that users survey for radiation and contamination at the frequency specified in the licensee's radiation safety procedures. In addition, the Radiation Safety office conducted confirmatory surveys of each active laboratory as part of the licensee's quarterly audit program. Independent surveys conducted by the inspectors during laboratory tours revealed no concerns. All readings were well within regulatory limits. From the review of records, discussions with personnel, and observations, the inspectors concluded that the licensee had conducted adequate area and removable contamination surveys. Also, the inspectors found licensee personnel were knowledgeable of the procedures and practices for conducting those surveys to ensure that removable contamination and area radiation levels were in accordance with NRC regulatory requirements. No concerns were noted with the licensee's survey methods or procedures.

07. Receipt, Transfer, Inventory and Leak Tests (87100 and 86740)

10 CFR 30.51(a) requires that each licensee keep records showing the receipt, transfer, and disposal of byproduct material.

License Condition No. 13 describes the requirements for leak testing sealed sources and/or devices possessed by the licensee.

License Condition No. 23 requires that the licensee conduct a physical inventory every six months to account for all sources and/or devices received and possessed under the license.

The inspectors reviewed sealed source leak tests and inventory records conducted from July 7, 1994, to the date of the inspection, and discussed those records with cognizant licensee representatives. The inspectors noted that sealed source leak tests and the semiannual inventories were conducted by Radiation Safety personnel as required. The inspectors also reviewed the licensee's computerized inventory tracking system. The licensee used a database program to track the receipt, decay, and disposal of licensed materials for both individual users and the licensee as a whole. The inspectors verified during the inspection that the licensee's current inventory was well within the licensee's possession limits for each isotope, and no losses had occurred during the inspection period.

In addition, radioactive material receipt and transfer records for the same period were reviewed and discussed. The inspectors noted that the licensee received one to two radioactive material packages per month on average. These packages contained small quantities of common isotopes used in research. The Radiation Safety office received and opened all radioactive packages and delivered them to the appropriate researcher. All necessary surveys and wipes were conducted by Radiation Safety.

Based on the reviews, discussions and observations of receipt, transfer, inventory and leak test methods, procedures and records, the inspectors determined that the licensee was complying with NRC and license requirements.

08. Personnel Radiation Protection (83822)

The application dated May 23, 1995, referenced in License Condition No. 26, describes the licensee's personnel dosimetry and bioassay requirements.

The inspectors reviewed radiation exposure records for 1994, 1995, and 1996 to date, and discussed those records with cognizant licensee representatives. From those reviews and discussions, the inspectors noted that for the period reviewed, the total effective dose equivalent (TEDE) whole body and extremity exposures were typically less than 20 and 50 millirem per year, respectively. Maximum TEDE and extremity exposures were 80 millirem, and 350 millirem per year, respectively. Approximately 100 persons were issued dosimetry. During the inspection, the inspectors observed licensee personnel wearing radiation dosimetry appropriately to detect radiation exposures from the handling and use of radioactive material at the licensee's facility. Dosimetry was exchanged monthly as required in the licensee's radiation safety procedures.

For internal dose, the committed effective dose equivalent (CEDE) for the period reviewed was essentially zero millirem. The inspectors noted that the licensee had adequate bioassay procedures in place. However, the inspectors noted that no users were using sufficient quantities of volatile radioactive materials to warrant bioassay.

Based on the reviews, discussions and observations regarding personnel exposure, the inspectors concluded that the licensee was maintaining personnel radiation exposures As Low As Reasonably Achievable and no NRC regulatory radiation exposure limit had been exceeded for licensee personnel.

09. Radioactive Waste Management (87100)

License Condition No. 18 authorizes the licensee to dispose of particular types of wastes with certain provisions. In addition, the application dated May 23, 1995, and the letter dated November 17, 1995, referenced in License Condition No. 26, describe the licensee's waste disposal practices and procedures.

The inspectors reviewed radioactive waste records for licensed activities July 7, 1994, to the date of the inspection, and discussed those records with cognizant licensee personnel. From those discussions and reviews, the inspectors noted that the licensee managed its radioactive waste through a variety of approved means, including decay-in-storage, sewer discharge, and offsite shipment. The inspectors reviewed and discussed the licensee's methods and procedures associated with each form of disposal and reviewed records of disposals made since the last inspection. No problems were noted with the licensee's monitoring of water effluents. All releases to unrestricted areas were well within regulatory limits. Occasional offsite shipments were made and were sent to licensed waste handlers. The waste storage facility was toured during the inspection and found to be satisfactory. The inspectors conducted radiation surveys in and around the waste storage area and radiation levels were well within regulatory requirements. Based on the reviews, discussions and observations regarding waste management, the inspectors concluded that the licensee adequately maintained radioactive waste at the licensee's facilities in accordance with NRC regulatory requirements.

10. Posting and Labeling (87100)

10 CFR 19.11 requires that the licensee post Form NRC-3, "Notice to Employees", current copies of Part 19, Part 20, and the license and related documents, or a notice describing these documents and where they may be examined.

10 CFR 20.1902(e) requires that the licensee post each area or room as specified. 10 CFR 20.1904(a) requires the licensee to label each container of licensed material as specified.

During the inspection, the inspectors observed that those areas within the licensee's facility where radioactive material was used was adequately posted with appropriate radiation warning and postings, including NRC Form-3. Also, the inspectors observed that sealed and unsealed sources and waste containers were appropriately labeled to identify the radioactive materials in them. Based on those observations, the inspectors concluded that the licensee had adequately

posted areas and labeled radioactive materials in accordance with NRC regulatory requirements.

EXIT MEETING SUMMARY

The inspectors presented the inspection results to licensee representatives at the conclusion of the inspection on September 11, 1996. The inspectors informed those licensee representatives present that no violations of NRC requirements were identified. Licensee representatives did not identify any documents or processes as proprietary in nature, and no dissenting comments were received from the licensee.

INSPECTION PROCEDURES USED

IP 87100: Licensed Materials Program
IP 83822: Radiation Protection
IP 86740: Inspection of Transportation Activities