U.S. NUCLEAR REGULATORY COMMISSION

REGION 111

Reports No. 50-116/83-01(DRMS); 70-084/83-01(DRMS)

Safeguards Group 5 Docket Nos. 50-116; 70-084 Licenses No. R-59; SNM-74

Licensee: Iowa State University of Science

and Technology Ames, 1A 50010

Facility Name: Iowa State University of Science and Technology

Inspection At: Iowa State University of Science and Technology, Ames, IA

Inspection Conducted: March 22-24, 1983

Date of Last Material Control and Accounting Inspection: January 10-12, 1978

Type of Inspection: Unannounced Routine MC&A

Inspector: Song Puttle

Physical Protection Specialist

Approved By:

Inspection Summary

Inspection on March 22-24, 1983 (Reports No. 50-116/83-01(DRMS); 70-084/8301(DRMS))

Areas Inspected: Nuclear material control and accountability including facility organization and operation; measurement and controls; shipping and receiving; storage and internal control; inventory; and records and reports. The inspection involved 24 inspector-hours by one NRC inspector and was begun during regular hours. Four of the 24 hours was during backshift periods. Results: The licensee was found to be in compliance with NRC requirements in the areas examined.

(Details - Part 2.790(d) Information)

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DETAILS

1. Persons Contacted

*Dr. Bernard Spinrad, Head, Department of Nuclear Engineering Elden Plettner, Reactor Technician

*Denotes attendance at the exit meeting.

2. Action on Previous Inspection Findings

No items of moncompliance were cited during the previous inspection. Paragraphs 3 and 9 of the previous inspection (Report No. 50-116/78-01; 70-84/78-01) cited a concern pertaining to consolidating procedures for the control and accountability of SNM. The licensee agreed to consolidate SNM control and accountability procedures into one SNM operating procedure. The inspector confirmed by observation that the current SNM control and accountability procedure was published in May 1978. Two revisions to the procedure, dated October 1980 and January 1981, respectively, have been made since the previous inspection. The procedure consolidated SNM control and accountability responsibilities and addressed physical inventory, control of SNM, depletion of uranium record maintenance, shipment of SNM, receipt of SNM, disposal of SNM, and reports pertaining to SNM. This item of concern is considered closed.

3. Exit Meeting

The inspector held an exit interview with the Head of the Department of Nuclear Engineering at the conclusion of the inspection on March 24, 1983. The inspector discussed the scope of the inspection and the inspection findings. In response to the inspector's comments, the licensee:

- a. Acknowledged the inspector's comments about closing the item of concern contained in the previous inspection pertaining to consolidating SNM control and responsibilities into a single operating procedure. (Paragraph 2)
- b. Agreed to redesignate or confirm the designation of the last the licensee's Accountability Custodian. (Paragraph 4)
- c. Agreed to correct the computer program for the Annual Physical Inventory Results to accurately show SNM possessed. (Paragraph 8)

4. Facility Organization and Operation

Designation of the SNM Accountability Custodian needs to be confirmed by the current Head of the Nuclear Engineering Department and Chairman of the Radiation Safety Committee.



The]was designated as the SNM Accountability Custodian in February 1977 by the Head of the Department of Chemical Engineering and Nuclear Engineering and the Chairman of the Radiation Safety Committee. However, in February 1983, a new Department Head for Nuclear Engineering was appointed and the licensee's reactor operations were placed under the responsibility of the Department of Nuclear Engineering. Additionally, subsequent to the February 1977 designation of the Accountability Custodian, a new Chairman of the Radiation Safety Committee was also appointed. When this matter was discussed with the Head of the Department of Nuclear Engineering, he agreed to confirm the as the SNM Accountappointment or re-appoint ability Custodian.

The responsibility for SNM receiving, shipping, inventory, storage, transfers, uranium depletion and records and reports have been delegated The The had prepared an operating procedure which addressed methods of fulfilling the responsibilities designated to him. The procedure appeared to provide sufficient guidance for SNM control and accountability. Additionally, adequate records and internal controls have been established to assure control and accountability of SNM.

Measurement and Controls 5.

The licensee's training reactor is a 10 kilowatt heterogeneous light water moderated, graphite reflected, thermal reactor. There are 12 positioned within two parallel elements spaced 24 inches on center. Each fuel element contains The reactor is normally operated and the The licensee has an is measured in fusing certain factors to report / The inspector reviewed the and confirmed that the factors used were: and at Base data recorded in Jkept in the com the reported on start of reactor operations in 1959, only slightly more than Approximately ... pertaining to is generated each The printout includes the





6. Shipping and Receiving

The licensee had no receipts of shipments of SNM since the previous inspection. Responsibility for shipment and receipt of SNM under both licenses, R-59 and SNM 74, has been delegated to the as the Accountability Custodian. Procedural guidance pertaining to shipment and receipt of SNM appeared adequate.

7. Storage and Internal Control

Internal transfers within the Tand between the and the Tares had occurred since the previous inspection. The transfers were recorded in the operating log by pattern and in the Fuel Transfer log by In December 1980, three fuel elements were disassembled and stored in the pit as spare fuel plates. Thirty-five fuel plates were involved in the disassembly. The inspector confirmed by review of the Fuel Transfer Log that internal movements and the disassembly were properly recorded.

Two fuel status boards were located within the current location of fueld.

These boards are changed and updated each time a fuel movement occurs. The inspector confirmed the accuracy of the status board during the physical inventory of SNM conducted on March 23, 1983. The accuracy of the fuel status board was confirmed by review of the Fuel Transfer Log. The latest internal movement of fuel occurred on November 22, 1982. At the time of the inspection, fuel pattern B was used within the

SNM was stored within the

These locations were authorized by the SNM Material Control and Accounting procedure. SNM by type (U-235 fission foils, fission chambers, Pu-Be sources, and fuel plates) was stored within the designated locations. No deficiencies were noted in storage or cont. of oil the licensee's SNM.

The licensee's authorized limits and possession of SNM as of March 24, 1983 is as follows (figures rounded):

License No.	Authorized Limit	Actual Possession (Isotope Wt.)
R-59	4,600 grams U-235 16 grams plutonium as Pu/Be Source	*4,513 grams 15 grams plutonium
SNM-74	117 grams U-235 as foils	117 grams U-235
	80 grams plutonium	75 grams plutonium



6.9 grams U-235 es foil contained in

5 grams U-235 (serial no. 613503, 613504, and 613501)

*Includes 6 grams for fission counters, remainder in fuel elements and fuel plates

The above figures were calculated independently of the licensee's calculations using corrected data from the 1982 annual physical inventory printout and results of the physical inventory conducted on March 23, 1983. The licensee's calculations were within one gram. The difference in computations is contributed to rounding of numbers.

Amendment No. 2 to License No. SNM-74 added 6.9 grams of U-235 foils contained in Amendment No. 2 was approved by NRC Headquarters on December 21, T978. No amendments to License No. R-59 were requested or approved since the previous inspection.

OCTOBER 12, 1979
IS the correct
date. Refer
to Lic cars 8.

License No. SNM-74 expires on December 31, 1983. License No. R-59 expired on the license on October 18, 1979.

SEPTEMBER 5, 1979.

Inventory

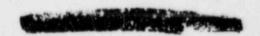
A physical inventory of SNM under License No. SNM-74 and reactor License No. R-59 was conducted by the inspector and licensee representatives on March 23, 1983. Inventory results were as follows:

SNM Type

Fuel Plates

Pu-Be Sources
(M-56, 57, 58, 59,
and 60)
U-235 fcils
Fission Counter (M1058)
Reuter Ftokes fission
counters (N-656 and
N-657)
Pu-Be Source (M-566)
Fission Counters (91702,
613501, 613503, 613504)

Fuel plates within the were accounted for by piece count. Fuel plates within the were verified by the Fuel Transfer Log and Fuel Pattern diagram. Pu-Be sources M-56, M-57, M-58, M-59, and M-60 were accounted for by serial number. The most recent leak test



During the previous inspection, the licensee possessed During this inspection, the licensee possessed

In December 1980, three fuel elements, consisting of 35 fuel plates, were disassembled and spare fuel plate groupings were created. However, the computer printout for Annual Physical Inventory results for 1981 and 1982 accounted for the three disassembled fuel elements as fuel elements and again as separate fuel plates. This resulted in the Annual Physical Inventory computer listing overstating the amount of SNM possessed. The licensee was aware of the input data error and they ran a supplemental computer listing to reflect the correct possession of SNM. When this issue was discussed with the Head of the Nuclear Engineering Department, he agreed to make the necessary computer program and/or input data changes to accurately reflect the SNM possessed on the Annual Physical Inventory printout for the March 23, 1983 and subsequent annual inventories.

9. Records and Reports

The licensee has confined possession and use of SNM to the locations and purposes authorized by license and has a records system to account for SNM possessed under license. Accountability is maintained on an prather than Exhibits A and B reflect the activity by license and material type for the period of inspection.

Forms NRC-742 and 742C were reviewed and a determination made that the forms were prepared and distributed as required for the period of this inspection (October 1, 1977 to September 30, 1982).

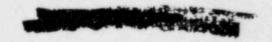
The following records were reviewed during this inspection:

Record

Forms NRC 742 and 742C
Fuel Transfer Log
Annual Fuel Inventory Forms
Annual Physical Inventory
Computer Printout

Quantity/Dates

October 1977 to September 30, 1982 October 1977 to September 30, 1982 March 1978 to March 1983 March 1978 to March 1982





Record

Burnup Calculation Computer
Printout
Licenses No. R-59 and SNM-74
and Amendments
Letter Designating
Accountability Custodian
SNM Control and Accounting
Procedure and Revisions
NMMSS Report No. SS-2 (Prepared
by Union Carbide at
Oak Ridge, Tennessee)
NMMSS Report I-82 (Prepared

Quantity/Dates

March 1978 to December 1982

Licensee's Copy

February 1977

May 1978

February 31, 1983

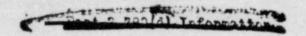
October 1, 1982

Attachments:

 Exhibit A - Material Balance Statement -Enriched Uranium

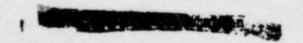
by Union Carbide at Oak Ridge, Tennessee)

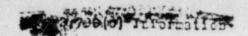
 Exhibit B - Material Balance Statement -Plutonium



lows State University of Science and Technology Material Balance Statement - Enriched Uranium License R-59 and SNM-74 for Period 10/1/77 to 3/23/831/

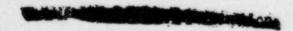
	Enriched Uranium In Grams	
	<u> </u>	<u>u-235</u>
Beginning Inventory 10/1/77	4,976	4,634
Receipts	0	0
Total to Account For	4,976	4,634
Shipments	o	0
Burnup	0	0
Ending Inventory 3/23/83	4,976	4,634





lowa State University of Science and Technology
Material Balance Statement-Plutonium
License R-59 and SNM-74 for Period 10/1/77 to 3/23/83

	Plutonium In Grams	
	Pu	Isotope
Beginning Inventory 10/1/77	96	90
Receipts		_0_
Total to Account For	96	90
Shipments	0	0
Ending Inventory 3/23/83	96	90
Total Accounted For	96	90



COMMITTEE TO BRIDGE THE GAP

1637 BUTLER AVENUE #203 LOS ANGELES, CALIFORNIA 90025 (213) 478-0829

March 24, 1984

Director
Office of Administration
US Nuclear Regulatory Commission
Washington, D.C. 20555

PREEDOM OF INFORMATION ACT REQUEST

FOIA-84-227 Carid 4-3-84

Dear Madam/Sir:

This is a request under the Freedom of Information Act, as amended.

I would like to obtain a copy of all inspection reports of physical security and safeguards inspections from 1979 to the present at the following Argonaut research reactor facilities:

University of California at Los Angeles University of Washington University of Florida Virginia Polytechnic Institute Iowa State University

To expedite this request, I ask only for the letters of transmittal, the cover sheets indicating which areas were inspected, and any non-classified details concerning inspection of protection against radiological sabotage, protection of vital or essential areas and vital or essential equipment

It would be most helpful if you could forward to us any portion of the requested documents as soon as it becomes available.

Because these materials are needed for a study of research reactor safeguards done in the public interest and without profit, I request a waiver on production costs.

Please respond to the following address: Committee to Bridge the Gap, Box 1186, Ben Lomond, CA 95005. Telephone (408)336-5381. Thank you.

Sincerely.

Steven Aftergood

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