UNIVERSITY REACTOR SHARING PROGRAM

Progress Report

Walter E. Carey and Brian K. Hajek

THE OHIO STATE UNIVERSITY

Columbus, Ohio

1 June 1973 - 31 May 1974

PREPARED FOR THE U.S. ATOMIC ENERGY COMMISSION

UNDER CONTRACT NO. AT(11-1)-2275

NOTICE

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Atomic Energy Commission, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

MASTER

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

fcg

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

A B S T R A C T

During the previous 12 months, 11 schools have utilized The Ohio State University Research Reactor (OSURR) under the USAEC Reactor Sharing Program. A total of 174 students, supervised by 13 faculty members from user institutions, have participated in experiments involving neutron activation analysis, isotope production, and reactor engineering and physics laboratories.

Thirteen schools were included in the second year of the USAEC University Reactor Sharing Program at The Ohio State University. These were:

- Air Force Institute of Technology
- University of Akron
- Bowling Green State University
- Capital University
- Carnegie-Mellon University
- University of Cincinnati
- Denison University
- Kenyon College
- Ohio Dominican College
- Ohio Wesleyan University
- Otterbein College
- University of Toledo
- Wittenberg University

Ten of these schools have made use of the facilities and services provided within the program, and one additional school, Xavier University, has also participated (See Table 1.).

Through the end of May, 1974, this represents about 90 percent of the funded utilization. Most utilization has been for individual laboratory sessions, and some has been for undergraduate student research. One M.S. thesis study, and one B.S. thesis study took place during the current project year. Individual laboratory problems and theses are listed for each school in Appendix A. About 78 percent of the reactor utilization was for neutron activation analysis and isotope production, while the remaining 22 percent was spent in performance of reactor engineering and physics experiments. The former category has resulted in 43 hours of gamma-ray spectroscopy system (GRSS) utilization. Hours of OSURR and GRSS utilization for each school are detailed in Table 1.

Less technical assistance per visit to OSU was required by the participating schools during the current project year than was required during the first year of the program. The primary reason for this was the experience in reactor experimentation gained by the participants during their first year in the Reactor Sharing Program. Technical assistance was provided by (with approximate percent of full time equivalent effort):

	<u>72-73</u> <u>Project Year</u>	<u>73-74</u> <u>Project Year</u>
Principal Investigator: W. E. Carey, Associate Professor & Director, NRL	(1% Time)	(1% Time)
B. K. Hajek, Research Associate & Operations Supervisor, NRL	(10% Time)	(3% Time)
R. W. Bailey, Research Associate & Physical Sciences Consultant, NRL	(2% Time)	(9% Time)
J. R. Wyvill, Research Associate	(0% Time)	(2% Time)

It is anticipated these individuals will continue to assist the users in the same proportions of effort, for the duration of the program.

During the current contract period, a concerted effort has been made to familiarize the users with reactor based research in a manner which will allow a still lower rate of technical assistance in future years. If this effort is successful, a greater number of students and faculty will be able to avail themselves of the irradiation facilities at The Ohio State University Nuclear Reactor Laboratory.

TABLE 1. 1973-1974 OSURR and GRSS Utilization* Under The
USAEC University Reactor Sharing Program

School	Principal Interest†	Number Involved			Number of Trips To OSU	Total Hours Use		Technical Assistance(Hrs)	
		Faculty	Departments	Students		OSURR	GRSS	Avg/Trip	Total
Akron, University of	NAA	1	1	13	1	2	0	3	3
Bowling Green State	NAA	1	1	9	2	17	8	16	32
Capital University	NAA	2	2	44	3	7	2.5	5	16
Cincinnati, University	NEE	1	1	17	4	29	0	10	38
Denison University	NR	1	1	1	1	0	0	3	3
Kenyon College	NAA	2	1	8	2	4	2	7	14
Ohio Dominican College	NAA	1	1	29	1	5	0	7	7
Ohio Wesleyan University	NAA	1	1	10	2	4	6.5	18	36
Otterbein College	NAA	1	1	41	7	20	18	6	44
Toledo, University of	NAA	1	1	0	1	0	0	2	2
Xavier University	NAA,IP	1	1	2	14	42	6	5	65
Totals & Accumulative Avgs.		13	12	174	37	130	43	7	260
Totals-Preceding Contract Period		13	10	82	22	122	53	9	198

* Actual utilization from June, 1973 through May, 1974

† NEE = Nuclear Engineering Experiments

NAA = Neutron Activation Analysis

IP = Isotope Production

NR = Neutron Radiography

APPENDIX A

Reactor Utilization by Participating Educational Institutions

June, 1973 - May, 1974

Akron, University of

Department of Biology, Prof. H.H.A. Dollwet
NAA and neutron cross section demonstrations

Bowling Green State University

Department of Geology, Prof. L. G. Walters, Jr.
NAA of Lake Erie sediments
NAA of isomorphous feldspar

Capital University

Department of Chemistry, Prof. C. A. Flanders
Department of Physics, Prof. Paul Beach
NAA and neutron cross section demonstrations

Cincinnati, University of

Department of Chemical & Nuclear Engineering, Mr. K. M. Emmerich
Radiation Safety
Neutron detector setup
Approach to critical
Control rod calibration

Denison University

Department of Biology, Prof. G. Norris
Investigation of neutron radiography

Kenyon College

Department of Chemistry, Prof. R. Batt
Prof. J. Pappenhagen
NAA of manganese in steel

Ohio Dominican College

Chemistry Department, Sr. Mary Hertrich
NAA of high purity aluminum

Ohio Wesleyan University

Department of Physics, Prof. L. T. Dillman
NAA and neutron cross section demonstrations

Otterbein College

Department of Physics, Prof. J. A. Taylor
NAA of high purity aluminum and neutron
cross section demonstrations
Saturation curve production
NAA of prepared "unknowns"
NAA of soil and plant samples
NAA of teeth for fluorine

Toledo, University of

Department of Geology, Prof. L. J. Charlesworth, Jr.
NAA of coastal marine sediment cores

Xavier University

Chemistry Department, Fr. Theodore C. Thepe
Production of antimony compounds for Szilard-Chalmers
reaction studies
NAA of fish organs