

F I F T E E N T H P R O G R E S S R E P O R T

of the

T E X A S A & M U N I V E R S I T Y
N U C L E A R S C I E N C E C E N T E R

January 1, 1978 - December 31, 1978

Prepared by

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and the

Nuclear Science Center Staff

Submitted to

U. S. Department of Energy

and

Texas A&M University

by

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June 1979

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II. REACTOR UTILIZATION

A. Utilization Summary

Utilization of the NSCR during the reporting period is shown in Figure 1 and Table I. Figure 1 presents reactor operation from January 1962 through December 1978. During the present reporting period the NSCR was used by more than 850 students and 48 faculty and staff members representing 22 departments at Texas A&M University. In addition, more than 202 faculty and students from 9 other colleges and universities used the facilities, and 4,084 visitors were registered during 1978, including 14 high school groups. A total of 22 non-university organizations had programs that were dependent upon the NSCR.

During sixteen years of operation, the NSC has provided services to 30 departments at Texas A&M University, 98 other colleges and universities, 53 industrial organizations and 14 government and state agencies (See Appendix IV and V for listings).

B. Utilization by the Texas A&M University System

During 1978 the following personnel from various departments at Texas A&M University used the NSCR for research. Appendix I describes the projects.

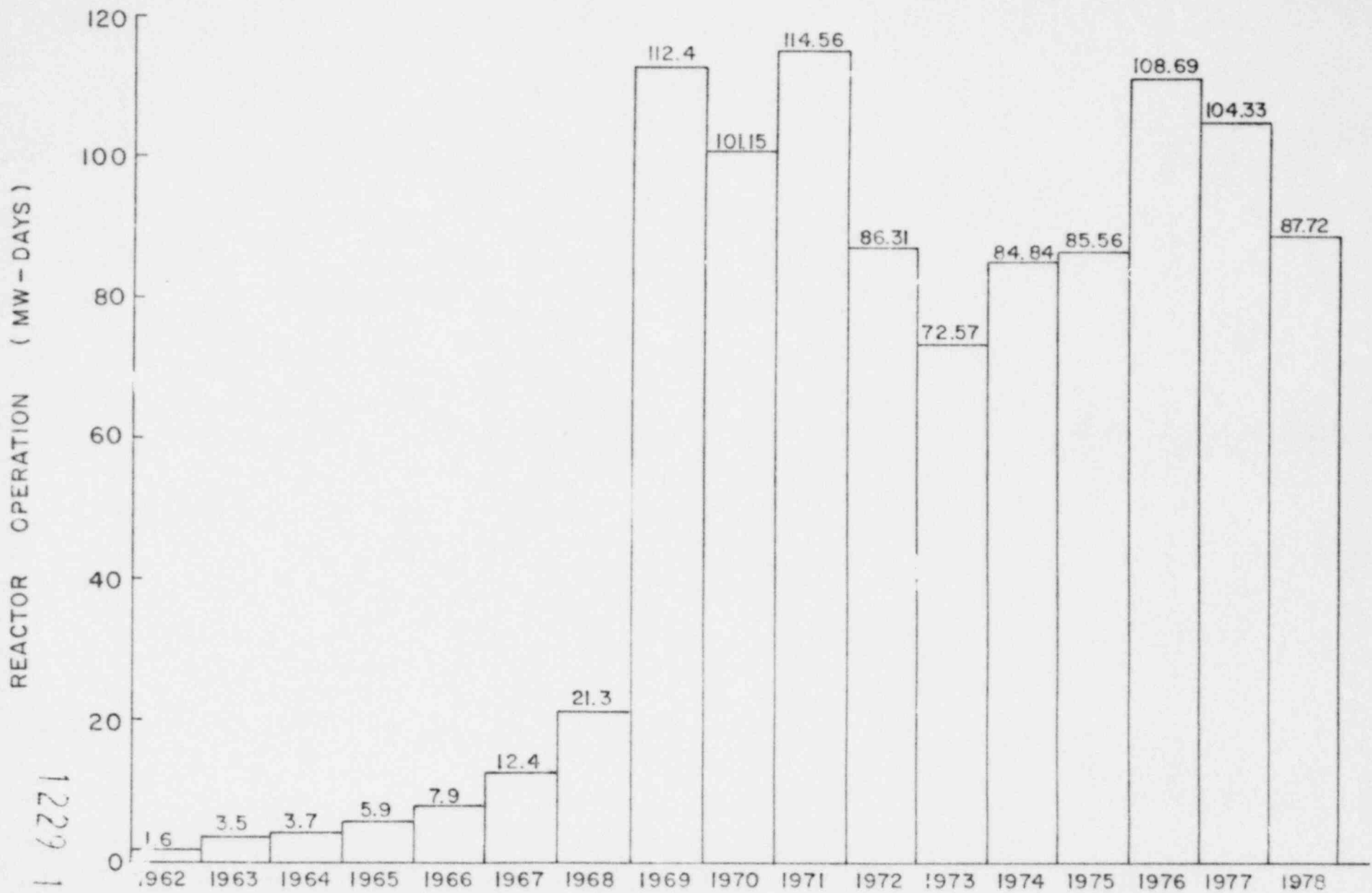
Chemistry Department

Faculty and Staff: Dr. M. W. Rowe, Assistant Professor
 Dr. E. Siefert, Post Doctorate
 Dr. Y. N. Tang, Associate Professor
 Dr. A. Clearfield, Assistant Professor
 Dr. T. Vickery, Professor

Students: R. Ferrieri R. Clark
 G. Harrison G. Day
 R. Tabor M. Hyman

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FIGURE 1. YEARLY REACTOR OPERATION

TABLE I
REACTOR UTILIZATION SUMMARY

	<u>1978 Annual Total</u>
*Number of Days Reactor Operated	235
Reactor Operation (MW-Days)	87.72
Number of Hours at Steady State	2170.34
Average Number of Operating Hours per week	43.41
Total Number of Pulses	0
Total Pulse Reactivity Insertion	0
Number of Irradiations	802
Number of Samples Irradiated	9,151
Sample Irradiation Hours	32,393.48
Average Number of Irradiations per Operating Day	3.41
Irradiation Experiment Hours	14,066.29
Beam Port Experiment Hours	82.0
Irradiation Cell Experiment-Hours	0
Total Experiment-Hours	14,149.20
Fraction of Utilization Attributable to Commercial Work	0.33
Number of Visitors	4,084

*Note: 50 Weeks of Operation Available

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Oceanography

Faculty: Dr. W. M. Sackett, Professor
 Dr. B. J. Presley, Professor
 J. Schofield, Research Associate
 J. Trefry, Research Associate

Students: Ron Pflaum
 Frederick Weber

Center for Trace Characterization

Staff: Mr. W. C. Kuykendall, Jr., Deputy Director
 Dr. J. McGinley, Assistant Research Chemist
 Dr. D. Moore, Assistant Research Chemist
 Dr. J. Efimenko, Assistant Research Chemist

Students: D. Hobson S. Johnson
 P. Andurer A. McGinley
 M. Yalo

Geology Department

Faculty: Dr. R. B. Scott, Associate Professor
 Dr. T. T. Tieh, Associate Professor
 Dr. W. Huang, Associate Professor

Students: J. Chatham J. Straccia S. Parks
 M. Miller E. Ledger

College of Medicine

Faculty: Dr. M. D. Devous, Research Associate

Students: George Cathey John Westover
 Robert Randall Patrick Giam

Nuclear Engineering Department

Faculty: Dr. R. G. Cochran, Professor and Head
 Dr. R. R. Hart, Instructor
 Dr. J. D. Randall, Professor
 Dr. R. D. Neff, Professor
 Dr. J. B. Smathers, Professor

Students: S. Williams W. Simmons D. Wootan
 L. Albert M. Urbantke

Nuclear Science Center

Staff: Mr. E. F. Bates, Health Physicist
 Mr. D. E. Feltz, Associate Director
 Dr. J. D. Randall, Director
 Mr. K. L. Walker, Reactor Coordinator
 Mr. J. P. Taft, Research Engineer
 Mr. B. J. Browning, Reactor Supervisor

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Animal Science Department

Faculty: Dr. W. C. Ellis, Professor
 Staff: Mr. John Snell, Research Associate
 Students: Carlos Lascano, Graduate Assistant

Industrial Education

Faculty: Dr. G. D. Gatcher
 Students: Ken Usiak

Radiological Safety Office

Staff: Dr. R. D. Neff, Radiological Safety Officer
 Students: J. Harville

Soil and Crop Sciences

Faculty: Mr. R. Drops, Research Associate

Veterinary Physiology and Pharmacology

Faculty: Dr. D. Hightower, Professor
 Staff: Dr. R. Badertscher, Clinical Associate
 Students: S. Tamulinas

In addition to the research performed by the above personnel, the NSCR was used as an educational aid in numerous academic courses offered by the University. Table II indicates the academic courses and the number of students using the facility.

C. Other Educational Institutions

In addition to Texas A&M University, services were provided to the following educational institutions. A description of some of the projects utilizing the reactor are presented in Appendix I.

Lamar University -- Beaumont, Texas

Faculty: Dr. Harold Baker -- Head, Chemistry Department
 Students: Chemistry Class

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McLennan Community College -- Waco, Texas

Faculty: Mr. Don Tatum -- Physics Department

Students: Physics Classes

Sam Houston State University -- Huntsville, Texas

Faculty: Dr. Charles K. Manka -- Physics Department

Students: Physics Classes

Rice University -- Houston, TexasFaculty: Dr. Thomas W. Leland -- Professor,
Chemical Engineering

Students: Chemical Engineering Class

Henderson County Junior College -- Athens, Texas

Faculty: Mr. White -- Physical Education Department

Students: Physics Classes

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TABLE II
ACADEMIC USE OF THE REACTOR
UNDERGRADUATE COURSES

<u>Department and Course</u>	<u>Credit Hours</u>	<u>Number Students</u>	<u>Student Credit Hours</u>	<u>Reactor Hours</u>	<u>Student Reactor Hours</u>
<u>CHEMISTRY</u>					
106 Chemical Perspectives	4	367	1468	1	367
<u>NUCLEAR ENGINEERING</u>					
101 Engineering Analysis	2	53	106	1	53
405 Nuclear Engineering Experiments	3	54	108	3	162
408 Principles of Radiation Protection	3	18	54	3	54
402 Nuclear Detection and Isotope Technology Laboratory	3	62	186	1	54
<u>PHYSICS</u>					
213 Physics for Students of Agriculture	3	40	120	1	40
220 Modern Physics	4	183	732	1	183
351 Experimental Physics for Non-Scientists	1	14	14	1	14
<u>CIVIL ENGINEERING</u>					
489A Power Plant Construction	3	31	93	1	31
<u>HEALTH EDUCATION</u>					
429 Man, Environment, and Health	3	71	213	1	71
<u>ENVIRONMENTAL DESIGN</u>					
489Q Special Topics	3	10	30	1	10
<u>MARINE ENGINEERING (Moody College)</u>					
305 Nuclear Marine Engineering	3	8	24	1	8
Totals		911	3148	16	1047

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TABLE II (Cont'd)
GRADUATE COURSES

<u>Department and Course</u>	<u>Credit Hours</u>	<u>Number Students</u>	<u>Student Credit Hours</u>	<u>Reactor Hours</u>	<u>Student Reactor Hours</u>
<u>BIO-CHEM./BIO-PHYSICS</u>					
626 Radioisotope Techniques	3	7	21	2	14
<u>NUCLEAR ENGINEERING</u>					
605 Nuclear Measurements Laboratory	3	5	15	7	35
606 Reactor Experimentation	3	6	18	18	108
685 Problems	3	1	3	7	7
<u>ARCHITECTURE</u>					
633 Environmental Controls Systems	3	10	30	1	10
<u>INDUSTRIAL EDUCATION</u>					
691 Research	12	1	12	29	29
685 Problems	3	9	27	1	27
<u>INDUSTRIAL HYGIENE</u>					
683 Evaluation and Control of the Occupational Environment	4	14	56	1	14
<u>CHEMISTRY</u>					
617 Application of Instrumental Methods of Analysis	3	5	15	6	30
685 Problems	3	13	39	1	13
<u>VET. PHYSIOLOGY</u>					
626 Bio-nucleonics	4	7	28	2	14
<u>PLANT SCIENCES</u>					
609 Quantitative Plant Physiology	4	9	36	1	9
Totals		87	300	76	310

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Texas Eastern University -- Tyler, Texas

Faculty: Dr. David Riddle -- Professor,
Chemistry Department

Students: Chemistry Class

Blinn College -- Brenham, Texas

Students: Math Club

Baylor University -- Waco, Texas

Faculty: Dr. Ken-Hsi Wang -- Physics Department
Dr. Van Tweedie -- Chemistry Department

Students: Physics Class
Chemistry Class

Texas State Technical Institute -- Waco, Texas

Faculty: Rob York -- Chairman, Nuclear Systems
Technology
Mr. H. Diegl -- Instructor, Nuclear
Systems Technology
Mr. B. R. Mahan -- Instructor, Nuclear
Systems Technology

Students: Nuclear Technology Class

University of Texas at Dallas

Experimenter: J. D. Randall

M. I. T.

Experimenter: M. Frey

High School ToursNo. Students

Cross Plains High School -- Cross Plains, Texas	30
McCallum High School -- Austin, Texas	8
Jasper High School -- Jasper, Texas	38
Beaumont High School -- Beaumont, Texas	9
Lampassas High School -- Lampassas, Texas	21
Georgetown High School -- Georgetown, Texas	15
De Soto High School -- Dallas, Texas	7
Bryan High School -- Bryan, Texas	20
Hardin-Jefferson High School -- Sour Lake, Texas	11
Grapeland High School -- Grepeland, Texas	15
Stephen F. Austin High School -- Bryan, Texas	58
Ennis High School -- Ennis, Texas	10
Waxahachie High School -- Waxahachie, Texas	22
San Saba High School -- San Saba, Texas	8

D. Non-University Institutions

National Aeronautics and Space Administration -- Houston, Texas

Experimenter: Dr. D. P. Blanchard

Nuclear Sources and Services -- Houston, Texas

Experimenter: R. D. Gallagher

Shell Developing Company -- Houston, Texas

Experimenters: L. H. Griffin E. L. Woody
R. H. Hunt

Texas Instruments, Inc. -- Dallas, Texas

Experimenters: J. White J. Keenan
M. Jack

Gulf Nuclear -- Houston, Texas

Experimenter: E. Acree

Texaco Inc. -- Houston, Texas

Experimenters: I. R. Supernaw A. J. Kinsella, Jr.
K. L. Walker

M. D. Anderson Hospital (University of Texas Medical Center)

Experimenter: J. Cundiff

Jefferson County D. A.

Experimenter: J. D. Randall

Oklahoma Medical Examiner

Experimenter: J. D. Randall

U. S. Air Force

Experimenter: R. Shaprey

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Universities, Colleges, Government, and State Agencies
Served by the NSC During Sixteen Years of Operation

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Other Universities and Colleges

Baylor University	Sam Houston State
Baylor, College of Medicine	University of New Hampshi .
University of Texas	Catholic College for Women
Texas Women's University	Taft College
University California, Los Angles	Blue Field College
Lamar State College of Technology	Potomac St. College
New Mexico State University	Thames Valley St. Tech. College
Rice University	Victoria College
Austin College	Tennessee Tech. University
Southern Methodist University	Wharton County Jr. College
California State Poly. College	Grayson County College
Washington University	West Virginia Inst. of Tech.
Hastings College	Galveston College
Winona State College	Arkansas Poly College
Wisconsin State University	Eastern Kentucky University
Milwaukee Institute of Technology	Sue Bennett College
Arkansas State College	Cheyney St. College
Ball State Teachers College	University of Genova
Texas Southmost College	U.iversity of Southern Louisiana
Stephen F. Austin College	University of Oklahoma
Louisiana State University	Somerset Community College
Xavier University	Grave City College
Temple University Penn.	Louisiana Tech.
Bemidgi State College	Abraham Baldwin College
Chadran State College	Kent St. University

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Other Universities and Colleges (Con't)

State University of Ohio	Pan American College
Alfred St. College	Tarleton St. College
Community College of the Finger Lakes	Columbus College
Nebraska Wesleyan University	Howard Payne College
Lock Haven St. College	Prairie View A&M College
San Bernadino Valley College	Longwood College
North Park College and Theological Seminary College	S.D. School of Mines
Fort Valley State College	North Shore Community College
Denison University	University of Wisconsin
State University College, N.Y.	Hill Jr. College
Auburn University	McLennan Community College
Clarion State College	Southeast Missouri St. College
University of Alaska	Southwestern State College
University of Arkansas	Mary Hardin Baylor
University of Houston	Texas State Technical Inst.
Southwest Texas State College	North Texas State University
Iowa State University	University of Arizona
Blinn College	McNeese State University
State College of Arkansas	Texas Eastern University
The Defiance College	Henderson County Jr. College
San Antonio College	Massachusetts Institute of Technology
Laredo Jr. College	University of Texas at Dallas
University of Corpus Christi	
South Dakota State	
Arapahoe Jr. College	
California St. College	

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Government and State Agencies

M.D. Anderson Hospital
Houston Police Department
Houston, District Attorney
Brooks Medical Center
National Aeronautics and Space Administration
North East Radiological Health Lab
Department of the Army
Wichita Falls, District Attorney
Corpus Christi, District Attorney
Dallas County, District Attorney
Denton County, District Attorney
Jefferson County, District Attorney
Oklahoma Medical Examiner
U.S. Air Force

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Texas A&M University Departments Served by
The NSC During Sixteen Years of Operation

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TAMU Department and Agencies

Department of Biochemistry and Biophysics
Department of Nuclear Engineering
Department of Oceanography
Activation Analysis Research Laboratory
Department of Physics
Department of Petroleum Engineering
Department of Animal Science
Department of Range Science
Department of Mechanical Engineering
Department of Wildlife and Fisheries Sciences
Department of Chemistry
Department of Large Animal Veterinary Medicine and Surgery
Radiological Safety Office
Cyclotron Institute
Department of Plant Sciences
Nuclear Science Center
Department of Veterinary Physiology and Pharmacology
Department of Radiation Biology
Center for Trace Characterization
Bioengineering Program, College of Engineering
Texas Engineering Extension Service, Electronic Training
Department of Geology
Department of Forest Science
Department of Soil and Crop Sciences
College of Medicine

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TAMU Departments (Con't)

Department of Health and Physical Education

Department of Architecture

Department of Building Construction

Department of Industrial Engineering

Department of Industrial Education

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