Report: DOE/NE/38152-3

U.S. DEPARTMENT OF ENERGY

UNIVERSITY REACTOR SHARING PROGRAM

AT THE UNIVERSITY OF FLORIDA

Final Report

for Period August 15, 2000 – May 31, 2001

Submitted by
Dr. William G. Vernetson
Director of Nuclear Facilities

Department of Nuclear and Radiological Engineering
College of Engineering
University of Florida
Gainesville, Florida

January 2002

U.S. Department of Energy
Award #DE-FG02-96NE38152

from CHO 3/25/02

DISCLAIMER

DISCLAIMER

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

FINAL REPORT ON DOE 2000-01
UNIVERSITY REACTOR SHARING PROGRAM
AT THE UNIVERSITY OF FLORIDA

Department of Energy Grant Number DE-FG02-96NE38152 was supplied to the University of Florida Training Reactor (UFTR) facility through the U.S. Department of Energy's University Reactor Sharing Program. The renewal proposal submitted in January 2000 originally requested over $73,000 to support various external educational institutions using the UFTR facilities in academic year 2000-01. The actual Reactor Sharing Grant was only in the amount of $40,000, all of which has been well used by the University of Florida as host institution to support various educational institutions in the use of our reactor and associated facilities as indicated in the proposal. These various educational institutions are located primarily within the State of Florida. However, when the 600-mile distance from Pensacola to Miami is considered, it is obvious that this Grant provides access to reactor utilization for a broad geographical region and a diverse set of user institutions serving over fourteen million inhabitants throughout the State of Florida and still others throughout the Southeast.

All users and uses were carefully screened to assure the usage was for educational institutions eligible for participation in the Reactor Sharing Program; where research activities were involved, care was taken to assure the research activities were not funded by grants for contract funding from outside sources. In some cases external grant funding is limited or is used up, in which case the Reactor Sharing Grant and frequent cost sharing by the UFTR facility and the University of Florida provide the necessary support to complete a

project or to provide more results to make a complete project even better. In some cases this latter usage has aided renewal of external funding.

Over its nearly 18 years implementation at the University of Florida, the DOE University Reactor Sharing Program has been a key catalyst for renewing utilization of the UFTR both by external users around the State of Florida and the Southeast and by various faculty members within the University of Florida to support the educational mission of dozens of different courses in over 20 departments and to support a number of unfunded as well as funded research projects. With a decline in usage in the early 1980s, the UFTR was in danger of going the way of so many university reactor facilities. Fortunately, the Reactor Sharing Program advertisements resulted in significant external use of the UFTR. Subsequently, potential internal users for courses and research noted that there was value in using the facility and their usage has grown synergistically. In the latter case of funded research, charges allow the UFTR to expand various programs still further. Therefore, the role of the Reactor Sharing Program, though relatively small in dollars, has been the single most important occurrence in assuring the rebirth and continued high utilization of the UFTR in a time when many better equipped and better placed facilities have ceased operations. Through dedicated and effective advertising efforts, the UFTR has seen nearly every four-year college and university in the State of Florida make substantive use of the facility under the Reactor Sharing Program with many now regular users. Some have even been able to support usage from outside grants where the Reactor Sharing Grant has served as seed money; still others have been assisted when external grants were depleted.

Though much more funding could be easily justified, much has been accomplished with the Grant received. In these times of concern about effective delivery of educational

programs, the UFTR Reactor Sharing Program is a leader in this area. Only by having excellent programs and effective learning tools could one have schools bring classes of students from their campuses to the University of Florida, sometimes over 100 miles for one-way travel. With every good experience by a user, we are assured not only of a return by that user group, but through communication with other schools at meetings to interchange ideas, we are assured of a continued increase in new users. The letter to Mr. Harold Young in Appendix I concerning Crystal River High School documents just one example from some years ago of how well regarded our program is and how much it is valued by the components of the educational community we have been able to reach. The Crystal River High School students continue to make periodic visits, always paying their own way! Mrs. Anne Butler says it is one of the true highlights in their chemistry curriculum. It clearly indicates the efficiency of our program at the grass roots level. Indeed, the fact that many groups of advanced and/or honors program students and faculty collected from various high schools visited our facility for substantive usage during the past year again shows the high regard the facility enjoys among secondary school educators throughout the State of Florida.

One key result of the many reactor sharing uses has been a concurrent rebirth of interest in our facility from those within the University of Florida. In a case directly attributable to the observed frequent use of our facility, the University of Florida College of Engineering supplied our analytical laboratory with a new complete PC-based analyzer system during the 1992-93 year. This system included all components from an HPGe detector and integral shield to a computer for performing the gamma ray energy spectrums analysis. This system as installed actually cost about the same amount as that year's

Reactor Sharing Grant, effectively doubling its dollar impact! Five years ago, a much smaller but still well used sum was made available to upgrade a computer system. Three years ago, two computer systems were upgraded with Pentium technology as state of the art. We are hoping similar support can be justified in this next year.

The three tables that follow provide basic information about the 2000-01 program and utilization of reactor facilities by user institutions under the Reactor Sharing Grant. Table 1 – Summary Information for the DOE University Reactor Sharing Program at the University of Florida delineates the basic information and data about the UFTR facility and the Reactor Sharing Grant needed to document its implementation through the University of Florida Training Reactor at the University of Florida as the host institution. Table 2 – Reactor Sharing Program Summary of Usage of UFTR Facilities lists users, numbers of usages and numbers of student and faculty participants. As shown in Table 2, last year's grant (2000-01) saw a broad spectrum of users, with one of the largest numbers of participants ever as we continue to deliver expanded services, especially for secondary school students and classes which is a personnel intensive but rewarding area of endeavor. This usage has been somewhat buoyed by last year's increase in Reactor Sharing funds as it is now at a historically high level versus several years ago. The diversity and number of user institutions listed in Table 2 is one of the largest ever in the 18 years of reactor sharing with the University of Florida Training Reactor. The various groups of honors-type high school students from High School Science Student Workshop participants to Career Shadowing Day participants to CPET Junior Science, Engineering and Humanities Symposium participants, among others, that made substantive use of the facility during this year are particularly encouraging for expanding the user community in the future. This

expectation is based on past experience where first time visiting high school and college students and educators are our best means of advertising the UFTR facilities and their availability. Indeed, the usage for the academic design JETS team participants in 1993-94 resulted in two new substantive users in the 1994-95 Reactor Sharing Program! This year again saw several new users, among them the QUARKNET High School Physics Teachers Workshop participants. Certainly the 41 separate entries in Table 2 are a tribute to the far reaching influence of the UFTR on education and research in Florida. Finally, Table 3 – Reactor Sharing Program Summary of Facility Utilization summarizes the activities supported under the 2000-01 grant with costs of consumable supplies and NAA Laboratory usage (frequently cost-shared at $35/hour) not included in the charge for reactor usage.

To support the interest of various users in the University of Florida facilities, several anecdotal pieces of information are repeated in Appendix I. The first is a two-page letter from Dr. W. G. Vernetson to Mr. Harold Young at Crystal River High School describing how one group of honors chemistry students assured their field trip to the University by gathering support (including finances) from other students. As a note, they now do this about once every other year! The school has repeated this effort many times! The second item is a letter from Dr. Max Lombardi whose nuclear medicine technology students had been making the one-way, two-hour trip from Hillsborough County to the University of Florida Training Reactor a regular event for thirteen years! Dr. Lombardi retired four years ago and his successor is now following in his footsteps. The other pages in Appendix I are simply copies of several thank-you's sent to our facility by various students and teachers following their visits over the last few years, and especially by students following successful completion of science fair projects. Several pages contain copies of cards—one

sent by a high school student who used our facility to support her science fair project which placed at the international level in Toronto in 1995, others are cards received from high school students whose science projects were supported. Several other pages include a copy of a humorous thank-you sent from an honors physics class that spent most of a day at the facility doing exercises and learning about nuclear energy. These communications are typical of our interactions with user groups, all of whom have expressed their appreciation for the services we have provided and for the special efforts made to tailor usages to meet needs whether related to education, training or research for students and faculty at all levels from secondary schools to four-year research universities.

Because of the success of this program, the limitations in funding are really the only factor limiting a two-to-three-fold increase in reactor sharing usage. Indeed, though we continue to do so on a limited basis, it is no longer necessary for the UFTR to advertise Reactor Sharing. Even with minimal advertising, the facility provided usage and other services easily valued at much more than the Grant value of $40,000 in 2000-01. Similar results will apply in an even more diverse set of usages to justify much more than the now increased $42,000 in the current 2001-02 Reactor Sharing Grant.

In conclusion, the DOE Reactor Sharing Program is a rousing success and should be continued as one of the most cost effective and best returns on invested dollars that are possible in assisting the United States in meeting the technological challenges of the twenty-first century. Indeed, it was because of educational and research usages like those supported by Reactor Sharing that the proposed NRC license fee was finally rescinded for University Reactors. Tours of our facility by one NRC Commissioner and the Executive Director for Operations clearly had a pivotal impact on the regulators' perspectives of such

facilities. The ability to show such widespread support for education and research at all academic levels enabled reactor facilities such as the UFTR to make a strong and valid case for externalized benefits to assure availability of facilities such as the UFTR for future academic support.

The only request from the UFTR facility is to expand the Reactor Sharing support so that facilities such as the UFTR can further advertise and expand delivery of reactor usage and related services. Those reached still represent only a small but ever-increasing fraction of all the students and faculty who could reasonably be expected to make valuable use of reactor facilities for their educational programs, though again this year several new schools are included among the users. This is particularly true for pre-college institutions and users—the source of our nuclear-trained leaders in the next century. Once they become a user, they continue to return; now we are beginning to see students majoring in Nuclear and Radiological Engineering and Health Physics as well as other branches of engineering, whose first contact with the subject was at the UFTR. Indeed, the graduating class in nuclear engineering in 1995 at the University of Florida contained two students whose high school teacher (Mrs. Renae Allen) first brought them to our facility about six years earlier as high school students. One of these students had been a leading student in our graduate program supported by a DOE fellowship and is now a post-doctoral associate in our department! Mrs. Allen uses our facility every year despite being located in Lake Butler, some 40 miles from Gainesville. She has also encouraged her students to do research for science fair projects at the UFTR as she had three students working on science fair projects here last year and one this year. Several of these projects have won regional and statewide honors, as have projects performed by students at West Miami Middle School, Palatka High

School, Pensacola Catholic High School, Wildwood High School and Spruce Creek High School, among others. Needless to say, this is a strong statement on behalf of continuing and expanding the educational and research activities supported by the University Reactor Sharing Program to attract as many bright students as possible to various programs in engineering, physics and chemistry, especially in areas related to applications of nuclear energy.

Three years ago we further expanded educational activities by supporting a training program to let students at a local community college participate in facility research projects. We continued this program with considerable success as one student was hired two year's ago to work part-time in our analytical laboratory. The objective here is to familiarize such students with nuclear and radiological engineering-oriented research and thereby attract such students into the nuclear or other technology-oriented fields of engineering.

TABLE 1

SUMMARY INFORMATION FOR THE UNIVERSITY REACTOR SHARING PROGRAM AT THE UNIVERSITY OF FLORIDA

Host Institution:	University of Florida
Location:	Gainesville, Florida
Project Director:	Dr. William G. Vernetson Associate Engineer/Director of Nuclear Facilities Nuclear and Radiological Engineering Department College of Engineering
Contact Numbers:	Telephone Number: (352) 392-1408, ext. 317 Fax Number: (352) 392-3380 Email Address: vernet@ufl.edu
Grant Number:	DE-FG02-96NE38152
Reactor Description:	University of Florida Training Reactor (UFTR) License Number: R-56 Docket Number: 50-83
Reactor Type:	Modified Argonaut Two-Slab Flux Trap Light Water Cooled Graphite/Light Water Moderated
Special Features:	Pneumatic Sample Delivery (Rabbit) System Neutron Radiography Capability (Static)

TABLE 2

REACTOR SHARING PROGRAM
SUMMARY OF USAGE OF UFTR FACILITIES
(August 2000 – May 2001)

School	Usages*	Faculty	Students
1. ATHENA Middle School Girls Camp Workshop	1	3	37
2. Belleview Middle School (BMS)	5	8	64
3. Broward Community College (BCC)	1	1	1
4. Catalina 4-H Clear Lake Project (CAT4H)	11	1	20
5. Chippola Community College (CCC)	1	1	1
6. College of Engineering Recruiting Days (High School Students)	5	5	93
7. Coral Park Miami Magnet School (CPMMS)	2	4	39
8. CPET Science, Engineering & Humanities Symposium	2	11	40
9. COE Visitors/Fuels Research Group	2	6	5
10. Engineering Fair Visitors	1	0	3
11. Eye on Engineering High School Student Workshop	1	1	27
12. FLAME Middle School Minority Outreach Summer Camp	1	2	32
13. Florida A&M University (FAMU)	1	1	1
14. Florida Community College of Jacksonville (FCCJ)	1	2	20
15. Gainesville Country Day School (GCDS)	2	4	24
16. Gulliver Preparatory High School (GPHS)	1	0	1
17. Hillsborough Community College (HCC)	2	1	10
18. Kanapaha Middle School (KMS)	1	1	37
19. Lecanto High School (LHS)	6	1	1
20. Living Faith Fellowship School (LFFS)	1	1	5
21. Massachusetts General	1	0	1
22. Mount Tahoma High School (MTHS) (WA)	2	1	10
23. Pace Brantley Hall School (PBHS)	2	2	15
24. Penn State University (PSU)	1	0	3
25. Pine Plains High School (PPHS) (NY)	1	0	3
26. P.K. Yonge High School (PKYHS)	7	1	70
27. QUARKNET High School Physics Teachers Workshop	1	11	0
28. Pine Ridge High School (PRHS)	7	3	1
29. River RidgeHigh School (RRHS)	1	3	1
30. Santa Fe Community College (SFCC)	7	4	43
31. Sarasota Riverview High School (SRHS)	1	2	0
32. Savannah State University (SSU)	2	3	1
33. Seminole Vo Tech Engineering Magnet School (SVTEMS)	2	4	46
34. Summer Science (Research) Training Program (High School Students)	9	3	93
35. Talbot Elementary School (TES)	1	1	1
36. Tampa Bay Vo Tech Magnet School (TBVTMS)	2	3	50
37. Tampa Preparatory High School (TPHS)	2	1	5
38. TREAT Workshop Research Followup	8	1	5
39. Union County High School (UCHS)	10	1	2
40. University of Central Florida (UCF)	10	3	2
41. University External Facility Visitors/Student Communications	7	6	4
TOTAL	**132**	**107**	**817**

* Usage is defined as utilization of the University of Florida Training Reactor facilities for all or any part of a day with the average being over four hours. In many cases, a school can have multiple usages but all related to the same research project such as one project for the University of Central Florida that involved long term irradiations as did others such as for Union County High School and Lecanto High School.

TABLE 3

REACTOR SHARING PROGRAM
SUMMARY OF FACILITY UTILIZATION
(August 2000 – May 2001)

NOTE: The projects marked with one asterisk (*) indicate irradiations or neutron activations. The projects marked with two asterisks (**) indicate training/ educational use. The projects marked with three asterisks (***) indicate demonstrations of reactor operations and other uses. "Experiment Time" is total time that the facility dedicates to a particular use; it includes "Run Time." "Run Time" is inclusive time commencing with reactor startup and ending with shutdown and securing of the reactor.

Project and User	Type of Activity	Run Time Hours	Experiment Time Hours
*Transmutation Doping of Pure Germanium Research - Dr. Robert Peale, Dr. Elena Flitsiyan, Dr. Andrei Muraviev, University of Central Florida, Physics Dept. - Reactor Sharing	Neutron Irradiation of Pure Germanium Crystals for Transmutation Doping to Support Investigation of Gain, Power and Duty Enhancement of p-Ge Lasers	34.13 (0.50)	47.74 (1.24)
*Trace Element Analysis of Environmental Samples for Hazardous Element Content - Dr. Kenneth Sajwan, Savannah State University, Mr. Cletus Bergen, Clean Air and Water - Reactor Sharing	Trace Element Analysis of Various Environmental Samples Obtained from Trucks Leaving Savannah River Laboratory to Determine Potential Hazardous Element Content as Follow-up to TREAT Workshop	11.34	15.91 (0.75)
*History of Science - Dr. J. Bieber, Santa Fe Community College - Reactor Sharing	Interview Discussion with Student Jonathan Breman Concerning Selection of Nuclear Engineering as a Profession Including Directing Non-power Reactor Facility	0.00	1.00

TABLE 3

REACTOR SHARING PROGRAM
SUMMARY OF FACILITY UTILIZATION
(August 2000 – May 2001)

Project and User	Type of Activity	Run Time Hours	Experiment Time Hours
*Center for Precollegiate Education and Training--Pine Ridge High School NAA Research on Trace Element Content of Human and Feline Hair - Mr. Charles Lundell, Ms. Darlene Daniels, Pine Ridge High School, Dr. W.G. Vernetson, UF - Reactor Sharing	Summer 1999 Student Research Program Project - Evaluation and Quantification of Variable Trace Element Content of Human and Feline Hair Subjected to Variations in Environment, Diet and Cleaning for Student Kristiana Sartore (Local/Regional Science Fair Winner)	27.24 (0.33)	35.00 (1.75)
*NAA Research to Quantify Certain Trace Elements in Lake Sediments - Ms. Kathie Ivy, Catalina 4-H Club Counselor Group Leader/ Dr. W.G. Vernetson, UF - Reactor Sharing	NAA Evaluation and Benchmarking of Sediment Samples for Catalina 4-H Clear Lake Project Including Consultation on Sample Collection and Base Line Trace Element Determinations to Support Long-Term 4-H Student Team Project	13.72 (0.16)	26.08 (0.83)
*NAA Research to Perform Trace Element Analysis on Various Infant Formula Samples - Ms. Renae Allen, Union County High School - Reactor Sharing	NAA Evaluation of Trace Element Content of Various Kinds of Commercially Available Infant Formula to Evaluate Variations in Trace Element Level for Health Purposes for Science Fair Project to Include Special Training for Student Jocelyn Cerdan (Local Winner/Regional Finalist)	9.10	23.77 0.42
***Broward Community College - Ms. Julie Binder, BCC/Dr. W.G. Vernetson, UF - Reactor Sharing	Walk-through Tour of Reactor and NAA Laboratory Facilities to Demonstrate Reactor Operation and Discuss Usage and Capabilities for Parent and Potential UF Student	0.50	1.00 (0.50)

TABLE 3

REACTOR SHARING PROGRAM
SUMMARY OF FACILITY UTILIZATION
(August 2000 – May 2001)

Project and User	Type of Activity	Run Time Hours	Experiment Time Hours
*NAA Research to Quantify Certain Heavy Trace Elements in Fresh Shrimp and Seafood Samples - Mr. Ron Worthington, Lecanto High School - Reactor Sharing	NAA Evaluation of Certain Trace Elements (Hg, As, Cr) in Fresh Gulf Fish and Shrimp Samples for a Science Fair Project for Amit Patel (Local/Regional/State Winner/International Competition)	4.56	11.58 (0.92)
***High School Outreach for Senior Recruitment to Engineering - Ms. J. Lingard / Ms. Y. Hankerson, COE - Reactor Sharing	Series of Lectures and Walk-through Tours of Reactor and NAA Laboratory Facilities Including Use of Survey Meters and Demonstration of Trace Element and Other Analytical Capabilities for High School Students and Parents Interested in Nuclear and Radiological Engineering and/or Engineering	0.00	6.41
***Sarasota Riverview High School - Mr. C. Vierbicky, Ms. K. Vierbicky, Sarasota Riverview HS, - Reactor Sharing	Walk-through Tour of Reactor and NAA Laboratory Facilities for two Sarasota Riverview High School teachers to discuss capabilities and usage	0.00	0.75
*Center for Precollegiate Education and Training – River Ridge High School NAA Research on Altered Trace Element Content of Roadside Soil Sediment - Ms. T. Tiede, Ms. J. Gartland, and Mr. R. Bradley, River Ridge HS in New Port Richey / Dr. W.G. Vernetson, UF - Reactor Sharing	Continuation of Summer 1999 Student Research Program Evaluation and Quantification of Trace Elements Especially Heavy Elements in Roadside Sediment Attributed to Transportation Vehicles for Ryan O'Leary	0.00	0.42 (0.33)

TABLE 3

REACTOR SHARING PROGRAM
SUMMARY OF FACILITY UTILIZATION
(August 2000 – May 2001)

Project and User	Type of Activity	Run Time Hours	Experiment Time Hours
Administrative and Education Communication Activities - Dr. W.G. Vernetson, UF - Reactor Sharing	Visit by DOE Representative Relative to Reactor Sharing Activities Plus Scheduling of Future Year Usages and Communications of Power and Non-power Reactor Usage and Capabilities and Operations Information to Support Academic Efforts at Various Schools	0.00	4.00 (0.08)
**Florida Community College at Jacksonville - Dr. Chew-Lian Lee and Dr. Ker Fong Lee, FCCJ Physics Dept. - Reactor Sharing	Lecture, Tour and Demonstration Exercises on Reactor Operations, Half-life Measurement, Trace Element Analysis Using the Rabbit System and Contamination Control Using Anticontamination Clothing and Robotic Manipulators for Community College Physics Students	0.78	5.50
***Massachusetts General Hospital - Dr. W.G. Vernetson, UF - Reactor sharing	Walk-through Tour of Reactor and NAA Laboratory Facilities to Discuss Usage, Capabilities and Potential Interest in Nuclear and Radiological Engineering Profession for Former Massachusetts General Hospital Radiation Control Technologist	0.00	1.75
**Gainesville Country Day School Science Classes - Ms. Eileen Homer, Ms. Janet Witte, Gainesville Country Day School - Reactor Sharing	Lectures, Tours and Demonstrations of UFTR Operations with Radiation Surveys and Exercises to Measure Half-life of Irradiated Elements and in Using the Rabbit System and PC-based Analyzers for Trace Element Analysis of Previously Irradiated Hair Samples Using NAA Techniques Plus Contamination Control Exercises Using Anticontamination Clothing with Subsequent Trace Element Analysis of Series of Hair Samples	1.07	6.83 (0.08)

TABLE 3

REACTOR SHARING PROGRAM
SUMMARY OF FACILITY UTILIZATION
(August 2000 – May 2001)

Project and User	Type of Activity	Run Time Hours	Experiment Time Hours
***Familiarization Tours for Visiting University / Other Faculty / Industry Instructors - Dr. W.G. Vernetson, UF - Reactor Sharing	Series of Walk-through Tours of Reactor and NAA Laboratory Facilities to Discuss Capabilities, Usage and Operations for Various Outside University Faculty Visitors and Industry Instructors	0.00	8.34
**Santa Fe Community College Nuclear Medicine Technology Program - Mr. S. Marchionno, Ms. Beth Shultzaberger, Ms. Amy Cohen, and Ms. Rochelle Sturm, SFCC - Reactor Sharing	Lecture, Tour and Demonstration of UFTR Operations with Radiation Surveys and NAA Training Exercises Demonstrating Isotope Identification and Trace Element Analysis of Previously Irradiated Hair Samples Using the Rabbit System PC-based Analyzers Plus Demonstration of Gas Flow Proportional Counter for Contamination Surveys with Subsequent Trace Element Analysis of Series of Student Hair Samples	0.87	6.67
**Gulliver Prep High School - Dr. W.G. Vernetson, UF - Reactor Sharing	Walk-through Tour of Reactor and NAA Laboratory to Discuss Usage, Capabilities and Nuclear Engineering as a Profession and How Non-power Reactors Are Important Including Demonstrations of Activities for High School Student Jeff Fensin and Parents from Gulliver Prep High School	0.00	2.58
***Centerfor Precollegiate Education 38th Annual Junior Science, Engineering and Humanities Symposium - Dr. M. J. Koroly, Ms. D. Paulin - Reactor Sharing	Series of Lectures, Tours and Demonstrations of Reactor and NAA Laboratory Facility Operations, Capabilities and Applications for Honors Group of High School Junior Level Students and Teachers	0.00	5.08

TABLE 3

REACTOR SHARING PROGRAM
SUMMARY OF FACILITY UTILIZATION
(August 2000 – May 2001)

Project and User	Type of Activity	Run Time Hours	Experiment Time Hours
**Kanapaha Middle School Science Class - Ms. Debra Magnusson, Kanapaha MS - Reactor Sharing	Lecture, Tour and Demonstration Exercises on Reactor Operations, Half-life Measurement, Trace Element Analysis Using the Rabbit System and Contamination Control Using Anticontamination Clothing for Science Students	0.00	2.33 (0.17)
**Demonstration of Reactor and NAA Laboratory Operations for Engineering Fair Participants - Dr. W.G. Vernetson, UF - Reactor Sharing	Lecture, Tour and Demonstration of UFTR and NAA Laboratory Operations Including Radiation Surveys of Everyday Objects and Discussion of Facility Usage and Capabilities for Engineering Fair Visitors	0.00	2.83
**Living Faith Fellowship School - Ms. Martha Boyle, Living Faith Fellowship School Science Teacher - Reactor Sharing	Lecture, Tour and Demonstration of Reactor and NAA Laboratory Operations Including Radiation Surveys of Everyday Objects and Discussions on Use of the Rabbit System and PC-based Analyzers to Determine Trace Element Content of Irradiated Hair Samples	0.00	1.25 (0.17)
**Demonstration of Reactor and NAA Laboratory Operations - Ms. Tammy Mandell, (Center for Precollegiate Education and Training) / Dr. W.G. Vernetson, UF - Reactor Sharing	Series of Lectures, Tours and Demonstrations of UFTR Operations with Radiation Surveys and NAA Laboratory Facility Operations Using Rabbit System and PC-based Analyzers for Trace Element Analysis of Previously Irradiated Hair and Other Samples Plus Follow-up Trace Element Analysis of Selected Hair Samples for Two Groups of Teachers and Students from Bellevue Middle School	2.62	9.16 (0.08)

TABLE 3

REACTOR SHARING PROGRAM
SUMMARY OF FACILITY UTILIZATION
(August 2000 – May 2001)

Project and User	Type of Activity	Run Time Hours	Experiment Time Hours
**Tampa Bay Vo Tech Magnet High School - Mr. Earl Wade (COE) / Dr. W.G. Vernetson, UF - Reactor Sharing	Lectures, Tours and Demonstrations of Reactor and NAA Laboratory Operations Including Radiation Surveys of Everyday Objects and Use of the Rabbit system and PC-based Analyzers for Tampa Bay Vo Tech Magnet High School Science Students and Teachers	0.00	3.58
**Santa Fe Community College Radiography Program - Ms. Bobbie Konter, SFCC - Reactor Sharing	Lecture, Tour and Demonstration of UFTR Operations with Radiation Surveys and NAA Training Exercises Demonstrating Isotope Identification and Trace Element Analysis Technique Using the Rabbit System and PC-based Analyzers Plus Demonstration of Gas Flow Proportional Counter for Contamination Surveys and Subsequent Trace Element Analysis of Series of Hair Samples	3.18	10.41 (0.33)
**Hillsborough Community College Nuclear Medicine and Radiation Therapy Technology Program - Dr. Larry Gibson, HCC - Reactor Sharing	Lecture, Tour and Demonstration of Facility Operations with Radiation Surveys and Exercise in Use of Rabbit System for Trace Element Analysis of Irradiated Hair Samples Using NAA Techniques and Demonstration of Neutron Radioisotopes and Use of Gas Flow Proportional Counters with Subsequent Trace Element Analysis of Series of Student Hair Samples	1.83	7.16 (0.33)
**Seminole Vo Tech Engineering Magnet High School - Mr. Earl Wade (COE) / Dr. W.G. Vernetson , UF - Reactor Sharing	Lectures, Tours and Demonstrations of Reactor and NAA Laboratory Operations Including Radiation Surveys of Everyday Objects and Use of the Rabbit system and PC-based Analyzers for Seminole Vo Tech Engineering Magnet High School Science Students and Teachers	0.00	3.67

TABLE 3

REACTOR SHARING PROGRAM
SUMMARY OF FACILITY UTILIZATION
(August 2000 – May 2001)

Project and User	Type of Activity	Run Time Hours	Experiment Time Hours
**Coral Park Miami Magnet High School - Mr. Earl Wade (COE) / Dr. W.G. Vernetson, UF - Reactor Sharing	Lectures, Tours and Demonstrations of Reactor and NAA Laboratory Operations Including Radiation Surveys of Everyday Objects and Use of the Rabbit system and PC-based Analyzers for Coral Park Miami Magnet High School Students and Teachers	0.00	3.75
***Pine Plains High School - Dr. W.G. Vernetson, UF - Reactor Sharing	Walk-through Tour of Reactor and NAA Laboratory Facilities to Discuss Usage, Capabilities and Nuclear Engineering as a Profession for High School Student Damon Roberts and Two Harris Corporation Non-nuclear Engineers	0.00	1.67 (0.75)
***Tampa Preparatory High School Science Dept. - Mr. Paul Homier, Physics Teacher, Tampa Prep HS - Reactor Sharing	Lectures, Tours and Demonstrations of UFTR Operations with Radiation Surveys and Exercises to Include Measurement of Half-life of Elements and in Using the Rabbit System and PC-based Analyzers for Trace Element Analysis of Hair Samples Irradiated in the Rabbit System Using NAA Techniques Plus Contamination Control Exercises Using Anticontamination Clothing and Robotics Demonstrations for AP Physics Students	1.20	5.83 (0.08)
***Regular, Honors and Advanced Placement Chemistry Class Curriculum Support - Dr. Paul Becht, P.K. Yonge Laboratory School /Dr. W.G. Vernetson, UF - Reactor Sharing	Preparation for and Presentation of a Series of Five Lectures, Tours of Reactor and NAA Laboratory Facilities with Demonstration of Operations, Measurements with Survey Meters and Half-life Plus Demonstration of Trace Element Analysis of Hair Samples Irradiated Via Rabbit System Plus Follow-up Trace Element Analysis of Series of Student Hair Samples for Five Regular, Honors and AP Chemistry Classes Coordinated to Fit Curriculum Planning	4.10	15.75 (0.75)

TABLE 3

REACTOR SHARING PROGRAM
SUMMARY OF FACILITY UTILIZATION
(August 2000 – May 2001)

Project and User	Type of Activity	Run Time Hours	Experiment Time Hours
***Talbot Elementary School - Dr. Mitchell Astron. / Dr. W.G. Vernetson, UF - Reactor Sharing	Walk-through Tour of Reactor and NAA Laboratory Facilities to Discuss Usage and Capabilities of Non-power Reactors Versus Design and Usage of Power Reactors for Music Professor and Advanced Fifth Grader with Special Interest in Nuclear Engineering	0.00	1.42
***Pace Brantley Hall School Science Dept. - Mr. Mitch Sirota/ Ms. Connie Hogue, Science Teachers, PBHS - Reactor Sharing	Lectures, Tours and Demonstrations of UFTR Operations with Radiation Surveys and Exercises to Include Measurement of Half-life of Elements and in Using the Rabbit System and PC-based Analyzers for Trace Element Analysis of Hair Samples Irradiated in the Rabbit System Using NAA Techniques Plus Contamination Control Exercises Using Anticontamination Clothing and Robotics Demonstrations for AP Physics Students	2.03	8.84
Support of Gamma Source Irradiation - Dr. Larry Robinson, Florida A&M University - Reactor Sharing	Support for Research Project Utilization of Gamma Irradiation for FAMU Student LaToya Luse	0.00	0.75 (0.50)
***Demonstration of Reactor and NAA Laboratory Operations for DOE / University / Industry Fuels Research Review Group - Prof. J.S. Tulenko, UF	Lecture, Tour and Demonstration of UFTR and NAA Laboratory Operations with Discussion of Facility Usage and Capabilities for Fuels Research Review Group Visitors	0.00	1.58

TABLE 3

REACTOR SHARING PROGRAM
SUMMARY OF FACILITY UTILIZATION
(August 2000 – May 2001)

Project and User	Type of Activity	Run Time Hours	Experiment Time Hours
***Pennsylvania State University - Dr. Haghighat, PSU - Reactor Sharing	Detailed Walk-through Tour of Reactor and NAA Laboratory Facilities for Three Students to Demonstrate Reactor Operations and Discuss Usage and Capabilities for Trace Element Analysis and Various Educational Opportunities	0.33 (0.33)	2.25 (1.50)
***Familiarization Tour for Instructor and Student from Chippola Community College - Mr. Alan Williams, CCC/Dr. W.G. Vernetson, UF	Detailed Walk-through Tour of Reactor and NAA Laboratory to Discuss Usage, Capabilities and Operations Including Curriculum Applications for Potential Nuclear Engineering Student Carly Williams and Technology Instructor Alan Williams from Chippola Community College	0.00	1.75
***Athena Middle School Girls Camp Workshop - Ms. J. Lingard (COE) / Dr. W.G. Vernetson, UF - Reactor Sharing	Lecture, Tour and Demonstration of Reactor and NAA Laboratory Operations Including Radiation Surveys of Everyday Objects, Measurement of Half-life, Demonstration Use of the Rabbit System and PC-based Analyzers to Determine Trace Element Content of Irradiated Hair Samples Plus Contamination Control Exercises Involving Dress Out in Anticontamination Clothing and Use of Robots for Demonstration Purposes	0.67	4.17
***Santa Fe Community College Technical Writing Project - Dr. W.G. Vernetson, UF - Reactor Sharing	Detailed Walk-through Tour and Discussion of UFTR Capabilities and Usage Versus Power Reactors with Interview of Facility Director to Support a Technical Writing Project on Non-power Versus Power Reactor Operations for SFCC Student Carlos Romero	0.00	2.42 (0.17)

TABLE 3

REACTOR SHARING PROGRAM
SUMMARY OF FACILITY UTILIZATION
(August 2000 – May 2001)

Project and User	Type of Activity	Run Time Hours	Experiment Time Hours
*NAA Educational Project to Perform Trace Element Analysis of Student Hair Samples - Mr. John Curie, Science Dept., Mt. Tahoma High School, Tacoma, WA / Dr. W.G. Vernetson, UF - Reactor Sharing	Trace Element Analysis of Series of Student Hair Samples to Support Nuclear Segment on Applications in High School Physics Class	3.25	5.67 (0.17)
**Center for Precollegiate Education and Training (CPET) Summer Science Training Program for High School Students - Dr. M.J. Koroly, Ms. Debra Paulin /Dr. W.G. Vernetson, UF - Reactor Sharing	Lectures, Tours and Demonstrations of Reactor Facility Operations and Experimental Capabilities Along with Research Possibilities for Training and Familiarization in Utilization of Neutron Activation Analysis Plus Summer Research Project Selection for Two CPET Summer Program High School Students, Jennifer Bennett and Robert Newman of Spruce Creek High School	1.58 (0.33)	21.83 (7.25)
***Eye on Engineering High School Student Workshop - Mr. J. Brunson (COE) / Dr. W.G. Vernetson, UF - Reactor Sharing	Lecture, Tour and Demonstration of Reactor and NAA Laboratory Operations Including Radiation Surveys of Everyday Objects, Measurement of Half-life, Demonstration Use of the Rabbit System and PC-based Analyzers to Determine Trace Element Content of Irradiated Hair Samples Plus Contamination Control Exercises Involving Dress Out in Anticontamination Clothing and Use of Robots for Demonstration Purposes	0.65	3.75

TABLE 3

REACTOR SHARING PROGRAM
SUMMARY OF FACILITY UTILIZATION
(August 2000 – May 2001)

Project and User	Type of Activity	Run Time Hours	Experiment Time Hours
**QUARKNET Workshop for High School Physics Teachers - Dr. Darin Acosta, UF - Reactor Sharing	Lecture, Tour and Demonstration of Reactor and NAA Laboratory Facility Operations Including Reactor Startup, Use of Survey Meters and Robotic Manipulators Plus Use of the Rabbit System and PC-based Analyzers to Conduct Half-life Measurements and Trace Analysis of Hair Samples	0.75	4.00
**FLAME Middle School Minority Student Outreach Summer Camp - Mr. Earl Wade (COE) / Dr. W.G. Vernetson, UF - Reactor Sharing	Lecture, Tour and Demonstration of Reactor and NAA Laboratory Facility Operations Including Reactor Startup, Use of Survey Meters and Robotic Manipulators Plus Use of the Rabbit System and PC-based Analyzers to Conduct Half-life Measurements and Trace Analysis of Hair Samples for Minority Middle School Students and Keba Hulela of Botswana University	0.67	3.42 (0.08)
*NAA Research on Sediments - Dr. K. Sajwan, Savannah State University - Reactor Sharing	Trace Element Analysis of Various Sediment Samples to Quantify Heavy Element Content	8.65	9.92 (0.08)
***Center for Pre-collegiate Education and Training - Dr. M.J. Koroly /Dr. W.G. Vernetson - Reactor Sharing	Lecture and Demonstration on Reactor Operations and Usage for Assembled Summer Science Training Program Participants (High School Students) and SSTP Student Counselors with Subsequent Facility Tours for a Number of Participants	0.00	4.08

APPENDIX I

NUCLEAR ENGINEERING SCIENCES DEPARTMENT
Nuclear Reactor Facility
University of Florida

[illegible], Director
[illegible] REACTOR BUILDING
[illegible], Florida 32611
[illegible] 392-1429 • Telex 541330

May 7, 1992

Mr. Harold E. Young
555 Quince Orchard Road
Gaithersburg, MD 20878

Dear Harry:

Per your request, here is an interesting anecdote that you may use for your communication to Nuclear News. To set the stage, Florida education system like many others has received massive budget cuts over the past 18 months with more very possible in FY93.

As part of our Reactor Sharing Program I arranged with Mrs. Anne Butler of the Crystal River High School Science Department that they would visit our facility on February 20, 1992. They were expected about 9:00 a.m. so they would have to leave early to make the 70 mile trip from the gulf coast; they would stay until late afternoon as they do every year under the Reactor Sharing Grant. They would get a lecture, tours, operations demonstrations, use of the Rabbit System to irradiate and do trace analysis on hair samples, use radiation detectors on various materials, learn and conduct exercises about contamination control, etc.

On the day before their arrival, Anne called to say they would be bringing a "few" more than the usual 15-20 students - 37 to be exact. Apparently Citrus County canceled all school buses/drivers for extra field trips so the students opened up the trip to another class and all chipped in to pay the one day cost of the bus (~ $100) to assure being able to have the trip. Only later I learned from a student as they were leaving that the students apparently initiated this action without Anne's knowledge and then she agreed to go along when they were clearly so interested.

These are excellent students generally and their chemistry course matches much of what we can do for them in exercises and demonstrations. They really do participate. Apparently the previous year's students were so impressed/pleased with our efforts to make their field trip a success that the word spread and they paid for the their own bus by getting more students to come. The least we could do for them was to give the a rousing visit and we did, though having 37 versus 17 was a challenge especially in our 25 seat lecture room! Certainly the Assistant Principal who accompanied them was pleased with how things went for the day. I told them we'd have juice and donuts the next time for them in appreciation of paying for the bus. My conclusion is that our younger generation is not all bad - we older folks just have to give them half a chance. This occurrence certainly contrasts with much of what we see and hear in the media about the younger generation!

I hope this meets your needs. If you need another anecdote sometime, I may be able to remember enough to recount the time the fellow from South America showed up with two huge black suitcases of topaz for me to irradiate - the law or someone was apparently not far behind as he left in a nervous flutter.

Thanks for ur interest and feel free to contact me if you need more information.

Sincerely,

Bill Vernetson

W.G. Vernetson
Director of Nuclear Facilities

WGV:p

P.S. Give my best to your wife. Will we see you both in Missouri for TRTR this fall?

Mr Vernetson
Thank you very much for your time to teach us about your lab. We enjoyed it. Love-
Amanda McCollum
I liked that cold stuff.

Thank You Mr. Vernetson and Associates

Nuclear Physics Lab

Mr. Vernetson,
Thanks for letting us come to your lab. It was cool holding that little radiation measure thing!
Sarah Corbaugh

I had a lot of fun there. I liked the Radiation detector, and the hair thing. Thankya for your time. Mr. Vernetson, Thank you for everything. It was so neat!
Marianne

Thanks a lot, I liked the cold that you could control to pick up things in the radiation room.
Lauren

Thanks for letting us come to your lab. I had fun
Megan

Mr. Vernetson, Thanks for answering all my weird questions and letting me hold your thing that looks like a pen that you hold up to the light. From Josie

Thank You for Everything
Rob Alston

Thanks for letting us come to the Nuclear Physics Lab. That liquid nitrogen stuff was really neat!
Beth Hudson

mr. vernetson Thank you for showing us around the Nuclear Physics Lab.
Carlie Magee

Thanks for your time. It was fun
Bethany T.

Ft. Clarke Middle School
8th Grade

thanks, it was very cool and very exciting
Maggie

I like that cold stuff that frezzes things
Love
Jen.

at the radiation in the hair sample. Thanks for spending your time w/ us.
@ Brandi K.

Thank You Mr. Vernetson and Associates Nuclear Physics Lab

Thank you for going to all that truble.
John Valdez

Thank you
Alyssa

THANK YOU!

Mr. V.
Thanks for all your time
K. Holt
AEMA
BYRON HARVEY
Place

Mike Carter thank you

Shana Carter thank you!!

Ft. Clarke Middle School
8th Grade

Dear Dr. Vernetsen,

thank you very,

very much for letting

me interview you. you

taught me more than

the encyclpedia could.

also thank you for the

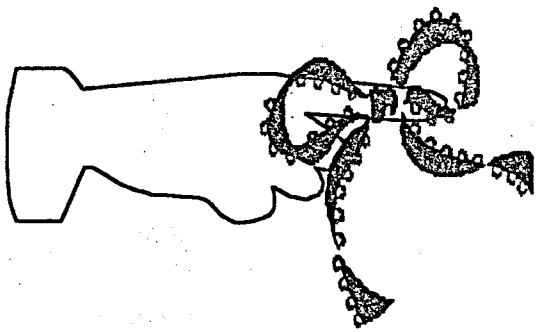
information packets

and tour of the

generator.

Will Winter

Just remember: I'll always be thankful, and I'll always be back for more!



STUYVESANT HIGH SCHOOL

LETTER OF THANKS FOR SUPPORTING RESEARCH PROJECT

Dear Dr. Vernetson,

Gayle and I want to thank you for working with Davy this past summer and guiding him through his research project. It was a wonderful experience for him and he values it very highly. He became very fond of the people he met and work with in the program.

Gayle & I both enjoyed the tour of the nuclear reactor, when we were visiting over the July Fourth weekend. This was the first such tour for both of us. We also enjoyed our stay on the UF campus.

[redacted]

Again, thank you very much the kind attention you showed to Davy.

Yours truly

David Jr.

STRAWBERRY THIEF
Block printed cotton, 1883,
by William Morris (1834-1896)
Victoria and Albert Museum
London, England

V&A MUSEUM

Caspari Ltd.
Saffron Walden,
Essex CB11 3AP

85-66637 B

SW 93rd Ave.
Gainesville, FL 32608
January 30, 2001

Dr. William Vernetson
Director of Nuclear Facilities
202 Nuclear Sciences Center
P.O. Box 118300
Gainesville, FL 32611-8300

Dear Dr. Vernetson,

Your tour was interesting because you explained the parts of the reactor very well. I didn't know there had to be so many safety precautions for the reactor. I also learned that there are many different kinds of uranium. My favorite part was when we searched the room for radioactive materials. You are a superb speaker because you don't stutter, and you make sure everyone can hear you.

Sincerely,
Matthew Neu

4430 SW 84th Way
Gainesville, FL 32608
January 30, 2001

Dr. William Vernetson
Director of Nuclear Facilities
202 Nuclear Sciences Center
P.O. Box 118300
Gainesville, FL 32611-8300

Dear Dr. Vernetson,

Thank you for teaching me and my class about the nuclear training reactor. I probably learned more than anyone else because I was absent four days straight last week while everyone else was taught. The rabbit system sounds very neat. I enjoyed hunting for radioactive objects. I hope you enjoy your career for ever.

Sincerely,
Gabriel Lowenthal

3840 NW 33rd Place
Gainesville, FL 32606
January 30, 2001

Dr. William Verneston
Director of Nuclear Facilities
202 Nuclear Sciences Center
P.O. Box 118300
Gainesville, FL 32611-8300

Dear Dr. Verneston,

Thank you for letting our class come visit the nuclear reactor. It was interesting when you told us that you could only use one type of uranium in a nuclear reactor. It was also interesting when you showed us the different ways to tell if we have been contaminated with a radioactive substance. I like the way you help hospitals like Shands prepare if the had a radioactive emergency. The coolest part of the visit was when we got to stand on top of the reactor.

Sincerely,

Sarah Goldberger

Sarah Goldberger

19802 Old Bellamy Rd.
Alachua, FL 32615
January 30, 2001

Dr. William Vernetson
Director of Nuclear Facilities
202 Nuclear Sciences Center
P.O. Box 118300
Gainesville, Fl 32611-8300

Dear Dr. Vernetson,

I thoroughly enjoyed your talk to my class. I didn't know that when a person is poisoned she or he has bits of that substance in her/his hair. I appreciated how you livened up your talk with jokes and a few non-scientific comments. I also enjoyed seeing all the equipment in the Nuclear Research Lab. Thank you for a fun and educational morning!

Sincerely,
Kristi Glazer
Kristi Glazer

7201 NW 28th Avenue
Gainesville, FL 32606
January 30, 2001

Dr. William Vernetson
Director of Nuclear Facilities
202 Nuclear Sciences Center
P.O. Box 118300
Gainesville, FL 32611-8300

Dear Dr. Vernetson,

Thank you for teaching me about the nuclear reactor. I didn't know that there are two kinds of uranium. It was neat when we saw the robotic arm. I had fun when we got to test the room for radioactive items. It is neat that someone can know if other people have poisons in their bodies and hair by taking a sample of their hair. I was fascinated when I saw how big the reactor was.

Sincerely,

Stacey M. Warren

Stacey M. Warren