

**GEORGIA INSTITUTE OF
TECHNOLOGY**

**NEELY NUCLEAR RESEARCH
CENTER**

TECHNICAL SPECIFICATIONS

TO

OPERATING LICENSE NO. R-97

DOCKET NO. 50-160

**REVISION TO FACILITATE
DECOMMISSIONING**

Page 1 of 14

1.0 DEFINITIONS

1.1 Channel Check - A channel check is a qualitative verification of acceptable performance by observation of channel behavior. This verification shall include comparison of the channel with other independent channels or methods measuring the same variable.

1.2 Channel Calibration - A channel calibration is an adjustment of the channel such that its output responds, within acceptable range and accuracy, to known values of the parameter which the channel measures. Calibration shall encompass the entire channel, including equipment actuation, alarm or trip.

1.3 Characterization - Characterization is the sampling, monitoring and analysis activities to determine the extent and nature of contamination. Provides the basis for acquiring the necessary technical information to plan the decommissioning activities.

1.4 Containment Integrity - Containment integrity exists when all of the following conditions are met:

- a. One door on each personnel air lock is closed and sealed.
- b. The truck door is closed and sealed.
- c. Controls, equipment and interlocks for isolation of the containment building are operable or the containment is isolated.

1.5 Decommissioning - Decommissioning is the action of removing a facility or site safely from service and reducing residual radioactivity to a level that permits: (1) release of the property for unrestricted use and termination of the license; or (2) release of the property under restricted conditions and termination of the license.

1.6 Decontamination - Decontamination are the activities employed to reduce the levels of radioactive and/or hazardous contamination in or on material, structures, and equipment.

1.7 Local Containment - Use of an enclosure and procedures to prevent or minimize the spread of contamination, often with HEPA-filtered ventilation.

1.8 Operable - Operable means a component or system is capable of performing its intended function in its normal manner.

1.9 Operating - Operating means a component or system is performing its intended function in its normal manner.

1.10 Reactor Shutdown - Reactor shutdown means that there is no fuel in the core.

1.11 Reactor Component - Reactor component shall mean any apparatus, device or material that is a normal part of the reactor structure.

1.12 Reportable Occurrence - A reportable occurrence is any of the following:

- a. An uncontrolled or unplanned release of radioactive material from the restricted area of the facility which results in a concentration that exceeds the limits set forth in 10 CFR Part 20.
- b. An uncontrolled or unplanned release of radioactive material which results in concentrations of radioactive materials within the restricted area in excess of the limits specified in 10 CFR Part 20.
- c. An observed inadequacy in the implementation of administrative or procedural controls such that the inadequacy causes or threatens to cause the existence or development of an unsafe condition in connection with decommissioning activities.

1.13 Surveillance Frequency - Unless otherwise stated in these specifications, periodic surveillance tests, checks, calibrations and examinations shall be performed within the specified surveillance intervals. These intervals may be adjusted plus or minus 25%. In cases where the elapsed interval has exceeded 100% of the specified interval, the next surveillance interval shall commence at the end of the original specified interval.

1.14 Surveillance Interval - The surveillance interval is the calendar time between surveillance tests, checks, calibrations and examinations to be performed upon any instrument or component when it is required to be operable. These tests may be waived when the instrument, component or system is not required to be operable, but the instrument, component or system shall be tested prior to being declared operable.

2.0 LIMITING CONDITIONS FOR OPERATION

2.1 REACTIVITY LIMITS

APPLICABILITY

This specification applies to the reactivity condition of the reactor.

OBJECTIVE

To assure that the reactor is shutdown at all times and that the safety limits will not be exceeded.

SPECIFICATION

All nuclear fuel remains removed from the reactor and containment building. No fuel shall be reintroduced into these areas.

BASIS

The reactor can not be operated without nuclear fuel.

2.2 SAFETY SYSTEMS

APPLICABILITY

This specification applies to radiation monitoring instrumentation and systems associated with decommissioning activities.

OBJECTIVE

To specify the lowest acceptable level of performance or the minimum number of acceptable components for radiation monitoring instrumentation and systems as determined by the Technical Safety Committee.

SPECIFICATION

The reactor shall not be made critical. The radiation monitoring instrumentation and systems shall be monitored to ensure that radiological releases to the environment are within acceptable levels as specified in 10 CFR Part 20.

BASIS

Radiation monitoring will assure that areas throughout the facility in which high radiation areas could occur due to improper sample handling, equipment or shielding movements are identified.

The gas monitor, filter bank monitor, Kanne chamber, and the moving air particulate monitor provide diverse and redundant channels which monitor particulate and gaseous releases from the reactor building.

2.3 CONTAINMENT BUILDING

APPLICABILITY

This specification applies to the Georgia Tech Research Reactor (GTRR) containment building requirements.

OBJECTIVE

To minimize the release of airborne radioactive materials from the GTRR.

SPECIFICATION

Containment integrity shall be maintained during decontamination activities involving possible airborne contamination levels above background.

BASIS

Building containment is a major engineered safety feature which serves as the final physical barrier to contain radioactive particles and gases present or produced during decontamination activities. Local containment will be used where possible to provide an additional contamination control boundary.

2.4 RADIOACTIVE EFFLUENTS

APPLICABILITY

This specification applies to the controlled release of radioactive liquids and gases from the reactor site.

OBJECTIVE

To define the limits and conditions for the release of radioactive effluents to the environs to assure that any radioactive effluents are as low as practical and would not result in radiation exposures greater than a few percent of natural background exposures, and within the limits of 10 CFR Part 20.

SPECIFICATIONS

a. Liquid Wastes

- (1) The concentration of gross radioactivity, above background, discharged

from the Reactor Building to the sanitary sewer during decontamination activities shall not exceed the limits of controlled discharge on a radionuclide basis set forth in 10 CFR Part 20 Appendix B, Table 3 and Notes.

- (2) Before discharging any liquid waste from any of the holdup tanks, the following shall be performed:
 1. Isolate the tank to be emptied so that no liquid waste can be added during discharge.
 2. Obtain a sample and analyze for content of radioactivity. If the radioactivity in that sample is within the limits of 10 CFR Part 20, release to sanitary sewerage system may begin. The process of discharging the liquid waste from the tank shall be stopped at a point past the halfway mark, but before the tank is 75% discharged, to analyze another sample. If results of the second analysis are within specified limits, release of the rest of the liquid waste may resume.
 3. Liquid waste that fails to meet radioactivity release limits during decontamination activities will be processed and again sampled for possible release to the sanitary sewer. If results are within specified limits, as above, release of the liquid waste may proceed.

If sample results fail to meet criteria for release following processing, as an option, the liquid can be treated and solidified for future disposal at a licensed waste disposal facility.

b. Gaseous Effluents

- (1) The maximum release rates of gross radioactivity in gaseous effluents during decontamination activities shall not exceed the limits set forth in 10 CFR Part 20 Appendix B, Table 2, Column 1 and Notes.
- (2) During decontamination activities involving possible production of airborne radioactivity, containment integrity shall be maintained and continuous air sampling will take place in an attempt to quantify the radiation exposure to personnel and to ensure that the 10 CFR Part 20 limits are not exceeded.

c. Liquid Effluents

- (1) The maximum release rates of gross radioactivity in liquid effluents during

decommissioning activities shall not exceed the limits set forth in 10 CFR Part 20, Appendix B, Table 2, Column 2 and Notes.

- (2) During decommissioning activities involving possible production of liquid radioactivity, all liquid waste will be directed to holding tanks where surveys shall be performed to ensure that the 10 CFR Part 20 limits are not exceeded.

BASIS

a. Liquid Wastes

The liquid waste handling system is described in the Safety Analysis Report dated January 10, 1995. Radioactive effluents released to the sewage on the basis of gross radioactivity are assumed not to contain Iodine - 129 and radium. The maximum amount of tritium in the discharge is limited to the value given in 10 CFR Part 20. The total quantity of radioactivity limit is in accordance with 10 CFR Part 20 for disposal to a sewage system. The independent samples taken prior to and during liquid effluent release shall determine the radioactivity concentration in the liquid released from the tanks and the radioactivity concentration in the discharge line to the sanitary sewers.

b. Gaseous Effluents

The release rate limit for gross radioactivity takes into account local meteorological data. The release rate limit for radionuclides and particulates with half lives longer than eight days takes annual average atmospheric dilution into account and ensures that at any point on or beyond the restricted area fence the requirements of 10 CFR Part 20 will be met. The limit is based on the annual average diffusion coefficient value of X/Q which is $4.1 \times 10^{-4} \text{ sec/m}^3$, for the 22.5° sector having the least diffusion on an annual average.

Isolation of the exhaust effluent stack is initiated by high radiation in the off-gas system. Such isolation is required for potentially abnormally high gross radioactivity releases due to decommissioning activities.

3.0 SURVEILLANCE REQUIREMENTS

3.1 SAFETY RELATED INSTRUMENTATION

APPLICABILITY

These specifications apply to the surveillance of safety related instrumentation.

OBJECTIVE

To assure that the systems important to safety are operable as required.

SPECIFICATIONS

The channels listed in Table 3.1 shall be checked and calibrated as indicated.

BASIS

Calibration of the safety related radiation monitoring instrumentation means to measure the performance as guided by the vendors instructions and performance specifications of the instrument in its response to accurately prescribed input signals.

TABLE 3.1

SURVEILLANCE REQUIREMENTS FOR SAFETY RELATED INSTRUMENTATION

| Channel | Surveillance Requirements | |
|---------------------------|---------------------------|---|
| | Daily Check (1) | Known Parameter Source Calibration Annually |
| Kanne exhaust gas | x | x |
| GM gas monitor | x | x |
| Moving filter particulate | x | x |
| Filter bank monitor | x | x |

(1) Applicable only when decommissioning work is being performed, otherwise monthly.

4.0 SITE DESCRIPTION

SPECIFICATION

- a. The reactor facility is located on the Georgia Institute of Technology campus in the city of Atlanta, Georgia.
- b. The restricted area is formed by a 2.5 meter high perimeter fence on the east, south and west of the containment building and the laboratory building on the north. The closest unrestricted area is 40 meters in a West-Southwest direction from the reactor stack exhaust.
- c. The exclusion area is the area inside the circle formed by a 100 meter (328 ft) radius centered at the reactor.
- d. The low population zone outer boundary is formed by a 400 meter (1312 ft) radius from the reactor center.
- e. The population center distance for the GTRR is established as radius of 523 meters (1750 ft) from the reactor center.

5.0 ADMINISTRATIVE CONTROLS

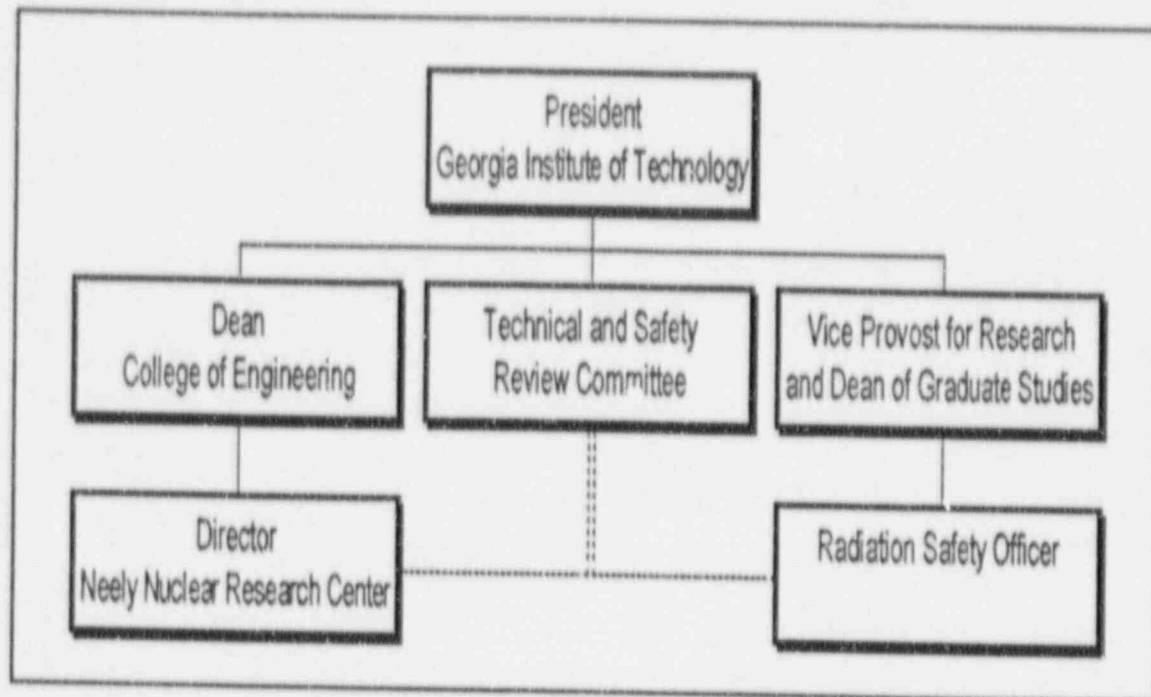
5.1 ORGANIZATION

- a. The organization for the management and oversight of decommissioning operations for the reactor shall be as indicated in Figure 5.1. The Director, Neely Nuclear Research Center (NNRC) shall have overall responsibility for direction and operation of the reactor facility, including safeguarding the general public and facility personnel from radiation exposure and adhering to all requirements of the possession only license and Technical Specifications.
- b. The Radiation Safety Officer shall advise the Director, Nuclear Research Center, in matters pertaining to radiological safety. He/she has access to the Vice-Provost, Research and Graduate Studies and/or the President of the Institute as needed.

5.2 TECHNICAL AND SAFETY REVIEW COMMITTEE

- a. The Technical and Safety Review Committee (The Committee) shall be established by the President of the Institute and shall be responsible for maintaining health and safety standards associated with the decommissioning of the reactor and associated facilities.

Figure 5.1 - Georgia Tech Organization for Management of the GTRR



- b. The Committee shall be composed of four or more senior technical personnel who collectively provide experience in reactor operations, radiochemistry, radiological safety, radiation protection, and mechanical and electrical systems.
- c. The Committee shall meet semiannually or as circumstances warrant. Written records of the proceedings, including any recommendations or occurrences, shall be distributed to all committee members and the President's Office.
- c. The quorum shall consist of not less than a majority of the Committee membership and shall include the chairman or his designated alternate.
- d. The Technical and Safety Review Committee shall:
 - (1) Review and approve determinations that proposed changes in equipment, systems, tests, or procedures do not involve an unreviewed safety question pursuant to 10 CFR 50.59(a).
 - (2) Review reportable occurrences.

- (3) Review and approve proposed procedures and proposed changes involving decommissioning activities. Minor modifications to procedures which do not change the original intent of the procedures may be approved by the Director of the NNRC on a temporary basis. The Committee shall consider for approval such minor modifications at its next scheduled meeting.
- (4) Review and approve proposed changes to the Technical Specifications and license excluding organizational structure. The responsibility and authority for organizational structure resides with the President of the Institute.
- (5) Review and approve proposed changes to the facility made pursuant to 10 CFR 50.59(a).
- (6) Review violations of the Technical Specifications, license or internal procedures or instructions having safety significance.
- (7) Review decommissioning or surveillance abnormalities having safety significance.
- (8) Review audit reports.
- (9) Audit decommissioning and surveillance records for compliance with internal rules, procedures, and regulations and with licensed provisions including Technical Specifications at least once per calendar year (interval between audits not to exceed 15 months).
- (10) Audit the results of action taken to correct those deficiencies that may occur in the reactor facility equipment, systems, structures or methods of operation that affect safety, at least once per calendar year (interval between audits not to exceed 15 months).

5.3 PROCEDURES

- a. The facility shall be decommissioned and activities performed in accordance with approved written procedures. All decommissioning procedures and major changes thereto shall be reviewed and approved by the Technical and Safety Review Committee prior to being effective. Changes which do not alter the original intent of a procedure may be approved by the Director of the facility. Such changes shall be recorded and submitted periodically to the Technical and Safety Review Committee for routine review.

- b. Written procedures shall be provided and utilized for the following:
 - (1) Normal operation of all systems related to safety.
 - (2) Actions to be taken in response to alarms.
 - (3) Emergency conditions involving potential or actual release of radioactivity.
 - (4) Radiation and radioactive contamination control.
 - (5) Surveillance and testing procedures.
 - (6) Physical security of the facility.

5.4 OPERATING RECORDS

- a. In addition to the requirements of applicable regulations, and in no way substituting therefore, records of the following items shall be maintained for a period of at least five years or as long as the facility is licensed by the U.S. Nuclear Regulatory Commission (USNRC) for possession of radioactive material:
 - (1) Normal facility operation and maintenance.
 - (2) Reportable occurrences.
 - (3) Tests, checks and measurements documenting compliance with surveillance requirements.
 - (4) Gaseous and liquid waste released to the environment.
 - (5) Off-site environmental monitoring surveys.
 - (6) Facility radiation and contamination surveys.
 - (7) Updated, corrected, and as-built facility drawings.
 - (8) Minutes of the Technical and Safety Review Committee meetings.
 - (9) Records of radioactive shipments.
- b. Records of radiation exposure for all personnel shall be kept indefinitely or until the USNRC authorizes their disposal.

5.5 ACTION TO BE TAKEN IN THE EVENT OF A REPORTABLE OCCURRENCE

In the event of a reportable occurrence, as defined in these Technical Specifications, the following action shall be taken:

- a. Ongoing activities shall cease until the occurrence has been resolved.
- b. All reportable occurrences shall be promptly reported to the Director of the Neely Nuclear Research Center or designee.
- c. All reportable occurrences shall be reported to the USNRC in accordance with appropriate regulations.
- d. All reportable occurrences shall be reviewed by the Technical and Safety Review Committee.

5.6 REPORTING REQUIREMENTS

In addition to the requirements of applicable regulations, and in no way substituting therefore, reports shall be made to the USNRC as follows:

a. Reportable Occurrence Report

Notification shall be made within 24 hours by telephone and fax to the Director, Office of Nuclear Reactor Regulation with a copy to the Office of the Regional Administrator, Region II followed by a written report within 10 days to the Director, Office of Nuclear Reactor Regulation with a copy to the Office of the Regional Administrator, Region II in the event of a reportable occurrence as defined in Section 1.0. The written report on these reportable occurrences, and to the extent possible, the preliminary telephone call and fax notification shall:

- (1) describe, analyze and evaluate safety implications;
- (2) outline the measures taken to assure that the cause of the condition is determined;
- (3) indicate the corrective action (including any changes made to the procedures and to the quality assurance program) taken to prevent repetition of the occurrence and of similar occurrences involving similar components or systems; and
- (4) evaluate the safety implications of the incident in light of the cumulative experience obtained from the record of previous failures and malfunctions of similar systems and components.

b. Unusual Events

A written report shall be forwarded within 30 days to the Director, Office of Nuclear Reactor Regulation, with a copy to the Office of the Regional Administrator, Region II, in the event of discovery of any unusual event, i.e. substantial variance from performance specifications contained in the Technical Specifications.

End of Document

Docket No. 50-160

Enclosure 2

Status Report

Enclosure 2 - Status Report

Georgia Tech Research Reactor Decommissioning Program

A. General

The Georgia Institute of Technology (Georgia Tech) has decided to permanently shutdown its research reactor and officially notified the United States Nuclear Regulatory Commission of this decision on July 1, 1997. In accordance with 10CFR50.82(b), Georgia Tech has started the process for license termination by structuring a decommissioning program that would achieve the license termination objective.

Georgia Tech has retained the services of NES, Inc. as of June 19, 1997, to fulfill the role of decommissioning consultant for this project.

B. Decommissioning Program Organization

Georgia Tech, as the licensee of the Research Reactor Facility, has total responsibility for the activities performed by its representatives and subcontractors. As such, Georgia Tech has elected to appoint a Technical and Safety Review Committee to set policy and provide oversight of Georgia Tech personnel and contractors involved with this decommissioning program. This particular committee intends to function in place of the Nuclear Safeguards Committee, which has a different charter as its main reason to exist. The newly appointed committee will only deal with activities relevant to the decommissioning and the surveillance program of the Georgia Tech Research Reactor.

The five members of the Technical and Safety Review Committee were appointed by the president of Georgia Tech on or about July 1, 1997, from key departments of the Institute. The

Radiation Safety Officer for Georgia Tech is a member, as well as the current Director of the Research Reactor. The interim Dean of Engineering, and the Chair of the Woodruff School of Mechanical Engineering, are members. The fifth member of the Committee represents Georgia Tech's Facilities Management and is the designated Project Manager for the decommissioning project. The Committee will obtain additional internal support from the Environmental Health and Safety Group, and from the Communications Division/External Affairs department. The support services from external sources will be provided by specialized subcontractors. All specialized subcontractors will report to Georgia Tech's Project Manager.

C. Current Status

The Georgia Tech Research Reactor Facility is under the following shutdown condition:

- All nuclear fuel has been removed from the facility as of February 19, 1996;
- All heavy water has been drained from the reactor and is stored in the D₂O holding tank;
- All reactor systems are functional;
- Safeguards and security systems are in compliance with current Tech Specifications;
- Surveillance and monitoring activities continue in accordance with current Tech Specifications;
- Radiological controls and access controls are in compliance with current Tech Specifications.

D. Activities to Date and Planned Activities

The following activities have been performed as of July 31, 1997:

- Decision to cease the operations of Georgia Tech's Research Reactor, June 1997;
- NES, Inc. retained as Decommissioning Consultant, June 19, 1997;
- Notification to the NRC of Dr. R.A. Karam's retirement and of the appointment of Dr. Nolan Hertel as Director of the reactor facility, June 30, 1997;
- Appointment of the Technical and Safety Review Committee by the President of Georgia Tech, June 30, 1997;
- Notification to the NRC of the decision to permanently shutdown the reactor, July 1, 1997;
- Notification informing the United States Department of Energy, Office of Nuclear Energy, of the decision to cease reactor operations and to cancel the shipment of the low-enrichment fuel (copy attached herewith), July 6, 1997.
- Project meeting whereby the Technical and Safety Review Committee and NES discussed the decommissioning program, upcoming activities, and most importantly, the review of 10CFR50.2, 10CFR50.51(b), 10CFR50.75, and 10CFR50.82(b), July 28, 1997;
- Research Reactor staff meeting whereby the technical personnel from the reactor, representatives from the Technical and Safety Review Committee, and NES toured the

reactor facility, discussed the decommissioning project phases, and most importantly, reviewed 10CFR50.51(b), July 29, 1997.

The following activities are planned:

- Preparation of the Possession-Only-License (P-O-L) amendment request by Georgia Tech and NES, August 1997;
- Review and approval of the P-O-L request by the existing Nuclear Safeguards Committee, August 5, 1997 (Minutes of the Nuclear Safeguards Committee Meeting of August 5, 1997 are attached hereto)
- Preparation and review of a Site Characterization Plan, August 19, 1997;
- Performance of a radiological and hazardous characterization of the facility by NES during September 1997;
- Public information meetings with citizen community groups during August and September 1997.

Attachments:

1. Letter dated July 6, 1997, to Mr. William Hartman from Dr. Nolan E. Hertel, one page
2. Minutes of the Nuclear Safeguards Committee Meeting of August 5, 1997. two pages.



Neely Nuclear Research Center
900 Atlantic Drive
Atlanta, Georgia 30332-0425
(404)-894-3600 Fax: (404)-894-9325

July 6, 1997

Mr. William Hartman
Office of Nuclear Energy NE-40
19901 Germantown Road
Germantown, MD 20874-1290

Dear Mr. Hartman:

This letter is to inform you that a request (dated July 1, 1997) was made of the Nuclear Regulatory Commission to change the operating license for the Georgia Tech Research Reactor to a Possession-Only license status. This is obviously the first step in decommissioning the research reactor facility. As a result, we do not intend to take possession of the low-enrichment fuel which DOE has manufactured for the reactor. We are most appreciative for DOE's support of the Neely Nuclear Research Center over the last thirty years.

Sincerely,

A handwritten signature in cursive script, reading "Nolan E. Hertel", is positioned above the printed name and title.

Nolan E. Hertel, Ph.D., P.E.
Director, Neely Nuclear Research Center

NEH/ars

cc: J.W. Ray
J.N. Davidson ✓

MINUTES OF THE NUCLEAR SAFEGUARDS COMMITTEE MEETING OF
August 5, 1997

Members Present: E.F. Cobb (Chair), R.A. Braga, S.M. Ghiaasiaan, L. Gucwa, B. Kahn, B. Livesay, J. O'Hara, T.G. Tornabene, and J. Vickery

Others Present: R.D. Ice, N. Davidson, B. Statham, J. Strydom, D. Blaylock and P. Newby

The Chair called the meeting to order at 1:05 PM.

1. The minutes of the May 22, 1997 meeting were approved with minor corrections. The revised version is available for inspection at the NNRC.
2. Dr. Davidson and Dr. Ice gave an update on the initial steps of the general plan to decommission the Georgia Tech Research Reactor. This included:
 - a. Revised Technical Specifications to Operating License No. R-97, Docket No. 50-160. This was discussed in detail by the NSC and approved with comments recorded by Dr. Ice. The revised version is available for inspection at the NNRC. The approved Technical Specifications are to be sent to the Nuclear Regulatory Commission as part of a request for a Georgia Tech Research Reactor possession only license.

The Technical Specifications call for a Technical Safety Committee to oversee the reactor decommissioning and all aspects of the NRC "possession only license". After the issuance of a "possession only license" by the NRC, the Nuclear Safeguards Committee will either be reconstituted as the Radiation Safety Committee or be retired with a new Radiation Safety Committee appointed by the President. The new Radiation Safety Committee will oversee the use of radioactive materials on campus and all aspects of the existing Georgia Radioactive Materials License.
 - b. Procedures and Work Orders to be dropped and HP surveys to be rescheduled on a monthly vs. weekly basis due to permanent reactor shutdown. This information is contained in the July 25, 1997 memo to Dr. Hertel and Dr. Ice from Fritz Strydom and Peter Newby. The NSC approved this list.
3. The GTRC Response to the NSC audit of NNRC Operations for FY 1997 was presented to the NSC. There were no comments.

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4. Form A Approvals:

| <u>P.I.</u> | <u>Project Title</u> |
|------------------|---|
| W.B. Carter | Pulsed Magnetic Field Effects on Metals, Using Ge-68. Approved. |
| Myrtle Turner | E.P.A. Lead Inspector Course, Using Co-57. Approved. |
| Jianhong Hu | Measurement of Trace Gases in the Atmosphere using Atmospheric Pressure selected Ion Chemical Ionization Mass Spectrometry, Using Am 241. Approved. |
| Yury Chernoff | Prion -chaperone Interactions in Yeast, Using S-35 & P32. Approved. |
| W.S. Johnson | Progressive Failure in Composite Laminates, Using X-Rays. Approved. |
| Lee Zacarias | Lead In Paint and Lead In Soil Analysis, Using Cd-109. Approved. |
| R.E. Braga | Electron Capture Detectors (ECD) for Gas Chromatographic Analysis in Chemistry Instructional Laboratories, Using Ni-63. Approved. |
| T.J. DiChristina | Detection of Iron Reducing Bacteria in the Waters and Sediments of the Gulf of Maine, Using P-32. Approved. |
| Mike Rodgers | Scanning Mobility Particle Sizer, Using Kr-85. Approved. |

5. A discussion was held on Procedures 9501/9502 with regards to the proposed deletion of the NNRC Director's approval on applications for Principal Investigator status. The NSC declined to vote on this matter, pending additional information on organizational changes and individual responsibilities.

The meeting was adjourned at 3:00 p.m. No future meeting was scheduled.

Respectfully submitted,

James C. O'Hara

James C. O'Hara

Enclosure 3

Technical and Safety Review Committee

Enclosure 3

Letters of Appointment and Curriculum Vitae
of the
Technical and Safety Review Committee Members

Dr. J. Narl Davidson
Interim Dean, College of Engineering
Georgia Institute of Technology

Chair of the Committee

Dr. Nolan E. Hertel
Associate Professor and Director
Neely Nuclear Research Reactor
Georgia Institute of Technology

Member

Dr. Rodney D. Ice
Principal Research Scientist and Manager of
Office of Radiation Safety
Georgia Institute of Technology

Member

Dr. Ward O. Winer
Regents Professor and Chair
George W. Woodruff School of Mechanical Engineering
Georgia Institute of Technology

Member

Mr. William A. Miller
Decommissioning Project Manager
Office of Facilities
Georgia Institute of Technology

Member



**Georgia Institute
of Technology**

July 8, 1997

Office of the President

IN CONFERENCE

Mr. Narl Davidson, Ph.D.
Acting Dean
College of Engineering
Georgia Institute of Technology
Atlanta, GA 30332-0306

Dear Narl:

Georgia Tech has made the decision to permanently cease the operation of our nuclear research reactor and intends to apply for a Possession-Only-License(P-O-L) and immediately begin to prepare a Site Characterization Plan and develop a Decommissioning Plan and cost estimate.

During this process, it will be necessary to have a Technical Safety Review Committee to provide technical and management oversight of the decommissioning activities of the GTRR. Specifically, the Committee will:

- ♦ Review and approve changes to existing GTRR Technical Specifications. Changes to the technical specifications will be prepared by NES, Inc. in conjunction with GTRR's technical staff. This document will be submitted to the NRC.
- ♦ Review and approval of a Radiological and Hazardous Site Characterization Plan. This document will be prepared by NES, Inc.
- ♦ Review and approval of the end-use of the facility and end-point of the decommissioning process. This activity will consist primarily of a Georgia Tech initiative and assisted by NES, Inc. This document will be the basis of the GTRR's Decommissioning Plan and cost estimate.
- ♦ Review and approval of the Decommissioning Plan of the Decommissioning Cost Estimate. These documents will be submitted to the NRC.
- ♦ Review and approval of all communications with the NRC.

I hope that you will serve as a chair of this committee and I appreciate your personal support of this important project.

Sincerely,

Wayne Clough
President

enclosures: Committee Membership

Georgia Institute of Technology
Atlanta, Georgia 30332-0325 U.S.A.
PHONE 404-894-5051
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A Unit of the University System of Georgia

An Equal Education and Employment Opportunity Institution

Technical Safety Review Committee

Chairman

◇ Dr. Narl Davidson
Acting Dean
College of Engineering
894-2982

Membership

◇ Dr. Nolan Hertel
Associate Professor
School of Mechanical Engineering
894-3717

◇ Dr. Rodney Ice
Radiation Safety Officer
Nuclear Research Center
894-3621

◇ Mr. Bill Ray
Executive Associate Athletic Director
Georgia Tech Athletic Association
894-9030

◇ Dr. Ward Winer
Regents Professor and Chair
School of Mechanical Engineering
894-3200

James Narl Davidson
Office of the Dean of Engineering
Georgia Institute of Technology
Atlanta, Georgia 30332-0360
(404) 894-3350

PRESENT POSITION:

Interim Dean, College of Engineering

EDUCATION:

Bachelor of Engineering Physics 1963
Cornell University

M.S. in Nuclear Engineering 1964
University of Michigan

Ph.D. in Nuclear Engineering 1969
University of Michigan

EMPLOYMENT:

Georgia Institute of Technology:

| | |
|----------------|--|
| 1990 - Present | Associate Dean, College of Engineering |
| 1983 - 1990 | Associate Professor and Associate Director, Mechanical Engineering |
| 1973 - 1983 | Associate Professor, Nuclear Engineering |
| 1977 - 1985 | Consultant, Tennessee Valley Authority, Power Operations Training Center |
| 1977 - 1980 | Consultant, Oakridge National Laboratory, Fusion Division |
| 1975 | Visiting Scientist, Argonne National Laboratory, Fusion Division |
| 1971 | Visiting Scientist, Gulf Energy & Environmental Systems, Fusion Group |
| 1970 - 1973 | Assistant Professor, Texas A&M University, Nuclear Engineering |
| 1969 - 1970 | AEC Postdoctoral Fellow, University of Michigan |

PROFESSIONAL:

Member, American Society of Mechanical Engineers
Member, Society of Sigma Xi
Member, American Society for Engineering Education - Past Chairman Nuclear Engineering Division

HONORS AND AWARDS:

American Nuclear Society's Mark Mills Award - 1969

Student Engineering Council's Outstanding Teacher Award, Texas A&M University - 1973

Outstanding Teacher Award, Georgia Tech - 1977

Engineer of the Year in Education Award, Atlanta Section, ASME - 1988

REPORTS AND PUBLICATIONS:

1. "A Study of Plasma Stability in Sheared Magnetic Fields," Nuclear Fusion, **8**, 203 (1968) with T. Kammash.
2. "Drift Cyclotron Instabilities in Sheared Magnetic Fields," Bull. Amer. Phys. Soc., **14**, 1078 (1969) with T. Kammash.
3. "Shear Stabilization of Drift Cyclotron Instabilities in Plasma," Trans. Amer. Nucl. Soc., **12**, 722 (1969).
4. "Shear Stabilization of Drift Cyclotron Instabilities in Plasma," Physics of Fluids, **13**, 721 (1970) with T. Kammash.
5. "The Equivalence of Two Approaches to Drift Waves in Sheared Fields to the Eikonal Method," Bull. Amer. Phys. Soc., **15**, 1439 (1970) with T. Kammash.
6. "Eikonal Approach to Drift Waves in Sheared Fields," Physical Review A, **4**, 1260 (1971) with T. Kammash.
7. "Enhanced Diffusion Due to Small Nonaxisymmetry in Toroidal Plasma," Bull. Amer. Phys. Soc., **16**, 1297 (1971) with D.K. Bhadra.
8. "The Effect of Small Asymmetry in Plasma Diffusion in Toroidal Systems," Gulf General Atomic Report No. A10838 (1971) with D.K. Bhadra.
9. "Neutron and Gamma Heating Rates in Fusion Reactor Blankets," Technology of Controlled Thermonuclear Fusion Experiments and the Engineering Aspects of Fusion Reactors, USAEC Conf-721111, 931 (1972) with R.T. Perry and W.H. Kohler.
10. "The Induced Activity and Decay Power of the Structure of a Stainless Steel Fusion Reactor Blanket," Proceedings of the First Topical Meeting on the Technology of Controlled Nuclear Fusion, Vol. 1 USAEC Conf-740402-P1 (1974) with D.W. Nigg.
11. "Fusion Power: Prospects and Impact," Proceedings of the National Electronics Conference, **29**, 113 (1974).

12. "The Effect of Toroidal Field Ripple on Trapped Particle Transport in Tokamaks," Bull. Amer. Phys. Soc., 20, 1240 (1975).
13. "Effects of Toroidal Field Ripple on Particle and Energy Transport in a Tokamak," Nuclear Fusion, 16, 731 (1976).
14. "Trapped Particle Drift Orbits in the Presence of Toroidal Field Ripple in a Tokamak," Bull. Amer. Phys. Soc., 22, 1179 (1977) with C.C. Chapin.
15. "The Electrostatic Sheath Potential for a Hot, Multispecies Plasma," Bull. Amer. Phys. Soc., 22, 1208 (1977) with A.T. Mense.
16. "Injection Scenarios in TNS," Trans. Amer. Nucl. Soc., 27, 89 (1977) with J.A. Rome and Y-K. M. Peng.
17. "Energy Engineering Education for the 21st Century," Journal of the Power Division, Proc. ASCE, 104, 35 (1978).
18. "The Consistency of Differential and Integral Thermonuclear Neutronics Data," LASL Report, LA-7067-T (1978), with W.A. Reupke and D.W. Muir.
19. "Burn Phase Control in Short Pulse D-T Burning Tokamak Reactors," Trans. Amer. Nucl. Soc., 30, 32 (1978), with W.M. Stacey, Jr.
20. "Divertor Sheath Revisited," Bull. Amer. Phys. Soc., 23, 896 (1978) with G.A. Emmert and A.T. Mense.
21. "Magnetohydrodynamic Coolant Flows in Fusion Reactor Blankets," Annals of Nucl. Energy, 6, 499 (1979), S. Khan.
22. "Energy Engineering Education for the Twenty First Century: A Viewpoint," Engineering Education (1979), with L.E. Weaver.
23. "The Collisionless Plasma Sheath Equation with Hot Volumetric Sources," Proceedings of the 1979 IEEE Inter. Conf. On Plasma Science, (1979), with R.M. Weiland, G.A. Emmert, and A.T. Mense.
24. "The Electric Sheath and Pre-sheath in a Collisionless Finite Ion Temperature Plasma," Trans. of the 1979 Sherwood Meeting, paper 2C80 (1979) with G.A. Emmert, R.M. Weiland, and A.T. Mense.
25. "The Potential Drop Across the Electrostatic Sheath of a Divertor Collector," Trans. Am. Nucl. Soc., 32, 75 (1979), with G.A. Emmert, R.M. Weiland, and A.T. Mense.

26. "The Use of Field Ripple for Burn Phase Control in Short-Pulse Tokamak Reactors," Georgia Tech Fusion Research Report GTFR-9 (June 1979), with W.M. Stacey, Jr.
27. "Desktop Calculators in the Nuclear Engineering Laboratory," Invited, Trans. Am. Nuclear Soc., 33, 108 (1979).
28. "Academic Involvement in Shift Technical Advisor Training," Trans. Am. Nuclear Society, 35, 40 (1980) with L.H. Sain.
29. "A Model for Ripple Transport in Tokamaks for Realistic Ripple Contours," Trans. Am. Nuclear Soc., 35, 137 (1980) with A.W. Engel.
30. "Plasma Transport and Impurity Behavior in the Edge and Divertor Regions of a Tokamak," Proc. 8th Inter. Conf. on Plasma Physics and Controlled Nuclear Fusion Research, IAEA-CN-38/Y-3 (July, 1980), with J.D. Callen, et al.
31. "Electronic Sheath and Presheath in a Collisionless, Finite Ion Temperature Plasma," Phys. Fluids, 23, 803 (1980), with G.A. Emmert, R.M. Wieland, and A.T. Mense.
32. "Consistency of Neutron Cross-Section Data, S_n Calculations, and Measured Tritium Production for a 14 MeV Neutron Driven Sphere of Natural Lithium Deuteride," Nuclear Science and Engineering, 82, 416 (1982), with W.A. Reupke and D.W. Muir.
33. "An Analysis of the Plasma Impurity Influence on Alkali-Metal Coatings for Fusion Reactor Applications," Journal of Nuclear Materials, 111, 448, (1982), with A.B. Dewald, A.R. Krauss, and D.M. Gruen.



**Georgia Institute
of Technology**

July 8, 1997

Office of the President

IN CONFIDENCE

Mr. Nolan Hertel, Ph.D.
Associate Professor
School of Mechanical Engineering
Georgia Institute of Technology
Atlanta, GA 30332-0405

Dear Nolan:

Georgia Tech has made the decision to permanently cease the operation of our nuclear research reactor and intends to apply for a Possession-Only-License(P-O-L) and immediately begin to prepare a Site Characterization Plan and develop a Decommissioning Plan and cost estimate.

During this process, it will be necessary to have a Technical Safety Review Committee to provide technical and management oversight of the decommissioning activities of the GTRR. Specifically, the Committee will:

- ♦ Review and approve changes to existing GTRR Technical Specifications. Changes to the technical specifications will be prepared by NES, Inc. in conjunction with GTRR's technical staff. This document will be submitted to the NRC.
- ♦ Review and approval of a Radiological and Hazardous Site Characterization Plan. This document will be prepared by NES, Inc.
- ♦ Review and approval of the end-use of the facility and end-point of the decommissioning process. This activity will consist primarily of a Georgia Tech initiative and assisted by NES, Inc. This document will be the basis of the GTRR's Decommissioning Plan and cost estimate.
- ♦ Review and approval of the Decommissioning Plan of the Decommissioning Cost Estimate. These documents will be submitted to the NRC.
- ♦ Review and approval of all communications with the NRC.

I hope that you will serve as a member of the Technical Safety Committee and I appreciate your personal support of this important project.

Sincerely,

A handwritten signature in black ink, appearing to read "Wayne Clough".

Wayne Clough
President

enclosures: Committee Membership

Georgia Institute of Technology
Atlanta, Georgia 30332-0325 U.S.A.
PHONE 404-894-5051
FAX 404-894-1277

A Unit of the University System of Georgia

An Equal Education and Employment Opportunity Institution

NOLAN E. HERTEL

Associate Professor

Nuclear Engineering and Health Physics Programs
 George W. Woodruff School of Mechanical Engineering
 Georgia Institute of Technology, Atlanta, Georgia 30332-0405
 O: (404) 894-3717 Fax: (404) 894-3733 H: (404) 416-7246
 Email: nolan.hertel@me.gatech.edu

EDUCATIONAL HISTORY

| | | | |
|-------|---------------------|--|------|
| Ph.D. | Nuclear Engineering | University of Illinois at Urbana-Champaign | 1979 |
| M.S. | Nuclear Engineering | Texas A&M University | 1975 |
| B.S. | Nuclear Engineering | Texas A&M University | 1973 |

Theses:

M.S. *Fast Neutron Spectra Produced by a 49-MeV Deuteron-Beryllium Reaction and its Modification by Selected Absorbers.*
 Ph.D.: *High-Energy Neutron Transport through Tungsten and Iron.*

RELEVANT EXPERIENCE

| <u>Title</u> | <u>Organization</u> | <u>Years</u> |
|----------------------------|--|------------------|
| <i>Associate Professor</i> | Georgia Institute of Technology Nuclear Engineering and Health Physics Program G. W. Woodruff School of Mechanical Engineering | 1/1993 - Present |
| | Chair, Health Physics and Radiological Engineering Research Group | 1994 - 1996 |
| | Chair, Nuclear Engineering, Radiological Engineering and Health Physics Group | 1996 - present |
| <i>Associate Professor</i> | The University of Texas - Austin Nuclear Engineering Area Mechanical Engineering Department | 9/1985 - 12/1992 |
| <i>Assistant Professor</i> | The University of Texas - Austin Nuclear Engineering Area Mechanical Engineering Department | 1/1979 - 8/1985 |
| <i>Research Assistant</i> | University of Illinois Nuclear Engineering Department | 6/1975 - 1/1979 |
| <i>Research Assistant</i> | Texas A&M University Nuclear Engineering Department | 6/1974 - 5/1975 |
| <i>Graduate Assistant</i> | Texas A&M University College of Engineering CO-OP/JETS Programs | 5/1973 - 5/1974 |

Consulting

| | |
|---|-------------|
| Technical Education Research Center (Teaching Module Preparation) | 1980 |
| Scientific Measurement Systems, Inc. (Neutron Applications in Industry) | 1982 |
| Texas Low-Level Radioactive Waste Disposal Authority (Review Technical Basis for the Texas Below Regulatory Concern Disposal Rule) | 1986 - 1987 |

| | |
|--|-------------|
| Allied Signal Inc., Engineered Materials Sector (Radiological Assessment of Contaminated Wood Pallet Burial) | 1989 |
| Schaeffer Associates for Odetics Advanced Intelligent Machines Division (Dosimetry Algorithm Development) | 1991 - 1993 |
| Baker-Hughes Incorporated, TN Technologies (Consultation on Doppler Flowmeter Use) | 1992 |
| University of New Mexico (Review of Radiation Transport Code Assessment) | 1994 |
| B&W Nuclear Environmental Services Incorporated (Radiological Assessment for the Demolition of the 232-F Stack Destruction) at Savannah River Site) | 1995 |
| IT Corporation (Review of Health Risk Assessment) | 1996 |
| NAC International (Skyshine Code Development, Benchmarking Shielding Analyses of Spent Fuel Dry Storage Containers Shielding Analyses) | 1996 - 1997 |
| Schaeffer Associates for CRC Research Institute (Japan) (First-Collision Code Development Plan) | 1997 |

HONORS AND AWARDS

| | |
|---|-------------|
| Tau Beta Pi | |
| Phi Eta Sigma | |
| Phi Kappa Phi | |
| Moody Science Foundation Scholar | 1969 - 1973 |
| Texas A&M University Former Students Association Scholarship | 1969 - 1973 |
| Summa Cum Laude Graduate, Texas A&M University | 1973 |
| University of Illinois Fellow | 1976 - 1977 |
| PHS Radiation Oncology Trainee | 1977 - 1978 |
| Best Paper Award, Radiation Protection and Shielding Division, American Nuclear Society Summer Meeting | 1978 |
| University Research Institute/Faculty Research Assignment (Battelle Pacific Northwest Laboratories) | 1987 - 1988 |
| Northwest Organization of Colleges and Universities for Science/Faculty Sabbatical Leave (Battelle Pacific Northwest Laboratories) | 1987 - 1988 |
| Best Paper Award, Topical Meeting of the American Nuclear Society Radiation Protection and Shielding Division: <i>New Horizons in Radiation Protection and Shielding</i> | 1992 |
| Best Paper Award, 1996 Winter Meeting of the American Nuclear Society, Radiation Protection and Shielding Division | 1996 |

PROFESSIONAL SOCIETY MEMBERSHIPS

| |
|---|
| American Nuclear Society |
| Atlanta Section of the American Nuclear Society |
| Health Physics Society |
| Atlanta Chapter of the Health Physics Society |

PROFESSIONAL REGISTRATION

| | |
|---|------------------|
| Texas State Board of Registration for Professional Engineers, Certificate No. 49365 | 6/1981 - 3/1994 |
| Professional Engineer, State of Georgia, License No. 021261 | 6/1994 - present |

AREAS OF INTEREST

| |
|---|
| Neutron and Gamma-Ray Transport and Measurement |
| Accelerator Applications |
| Radiation Shielding |
| High-Energy Neutron/Particle Interactions |
| Health Physics |
| Radiation Instrument Response and Spectra Unfolding |
| Radiation Dosimetry and Phantoms |

Low-Level Radioactive Waste Disposal
Radiological Assessment
Health Risk Assessment
Radiation Instrument Calibration

RESEARCH GRANTS

Bureau of Engineering Research: *New Faculty Research Initiation Grant: Development of Measurement Capabilities for Integral Testing of Nuclear Data*, September 1979 - September 1980, \$3,000.

The University of Texas Special Equipment Allocation to the Mechanical Engineering Department: *Upgrade of NE-213 Spectrometry System*, November 1979 - September 1980, \$15,130.

National Science Foundation: *Research Initiation: High-Energy Neutron Transport Studies*, CPE-8006674, May 1980 - October 1982, \$39,975.

University Research Institute: *Construction and Calibration of an Associated Particle System to Monitor a DT Neutron Source*, April 1981 - September 1982, \$4,354.

Sun Oil Special Summer Research Grant: *Investigation of Nuclear Data for Well Logging*, June 1982 - September 1982, \$6,500.

Texas Atomic Energy Research Foundation: *Neutron Multiplication by Beryllium*, June 1982 - September 1982, \$5,000.

The University of Texas Special Equipment Allocation to the Mechanical Engineering Department: *Nuclear Engineering Teaching Laboratory: Undergraduate Laboratory Stations*, September 1982 - September 1983, \$41,000.

The University of Texas Special Equipment Allocation to the Mechanical Engineering Department: *Neutron Generator Upgrade*, September 1982 - September 1983, \$7,000.

The University of Texas Special Equipment Allocation to the Center for Fusion Engineering: *Fusion Neutronics Equipment*, September 1982 - September 1983, \$20,000.

Texas Atomic Energy Research Foundation: *Development of Fusion Blanket Neutronics Program*, June 1983 - September 1983, \$7,000.

Texas Atomic Energy Research Foundation: *Calibration of Neutron Counting Equipment for Beryllium Multiplication Experiment*, September 1983 - January 1985, \$9,044.

Texas Low-Level Radioactive Waste Disposal Authority: *An Evaluation of Methods of Low-Level Radioactive Waste Disposal*, September 1984 - June 1985, \$9,736.

The University of Texas Special Equipment Allocation to the Mechanical Engineering Department: September 1984 - September 1985, \$6,850.

IBM PROJECT QUEST: *Implementation of Bonner Sphere Unfolding Codes on an IBM PC*, January 1985 - April 1986, \$6,300.

National Science Foundation: *Neutron Multiplication by Beryllium*, January 1985 - December 1987, \$139,557.

University of Rochester Strong Memorial Hospital (PHS Consortium): *Energy Spectral Measurements of Clinical Fast Neutron Beams: NE-213 Measurements*, May 1985 - May 1986, \$13,720.

Grove Engineering: *Microcomputer Shielding and Radiation Software Package*, December 1986, \$2000.

Texas Low-Level Radioactive Waste Disposal Authority: *BRC Radwaste Stream Computer Modeling*, June 1987 - August 1987, \$9,745.

Texas Advanced Technology Program: *Nuclear Technology Study of the Fusion Ignition Experiment IGNITEX*, June 1988 - May 1990, Co-PI/PD with Dr. G.A. Hallock and Dr. R. Carrera, \$344,110.

Texas Low-Level Radioactive Waste Disposal Authority: *Performance Assessment and Monitoring of the Ambient Radiation Levels for a Prospective Low-Level Radioactive Waste Disposal Site*, June 1, 1988 - August 31, 1989, Co-PI/PD with Dr. R. J. Charbeneau, \$194,035.

Texas Low-Level Radioactive Waste Disposal Authority: *Performance Assessment and Monitoring of the Ambient Radiation Levels for a Prospective Low-Level Radioactive Waste Disposal Site*, September 1, 1989 - August 31, 1990, Co-PI/PD with Dr. R. J. Charbeneau, \$121,539.

Texas Low-Level Radioactive Waste Disposal Authority: *Performance Assessment and Monitoring of the Ambient Radiation Levels for a Prospective Low-Level Radioactive Waste Disposal Site*, September 1, 1990 - August 31, 1991, Co-PI/PD with Dr. R. J. Charbeneau, \$80,464.

Texas Low-Level Radioactive Waste Disposal Authority: *Performance Assessment and Monitoring of the Ambient Radiation Levels for a Prospective Low-Level Radioactive Waste Disposal Site*, September 1, 1991 - August 31, 1992, Co-PI/PD with Dr. R. J. Charbeneau, \$124,766.

University of Texas Health Science Center at San Antonio: *PET Cyclotron Vault Neutron Shield Analysis*, April 1, 1992 - August 31, 1992, \$5,114.

Texas Low-Level Radioactive Waste Disposal Authority: *Performance Assessment and Monitoring of the Ambient Radiation Levels for a Prospective Low-Level Radioactive Waste Disposal Site*, September 1, 1992 - August 31, 1993, Co-PI/PD with Dr. R. J. Charbeneau, \$107,216.

ERDA/Westinghouse Savannah River Company: *Consolidated Incineration Facility Health Risk Assessment*, February 22, 1994 - September 30, 1995, \$278,618.

ERDA/Westinghouse Savannah River Company: *Benchmarking the LAHET Elastic Scattering Model for APT Design Applications*, July 12, 1996 - November 30, 1996, \$30,674.

"Benchmarking of the LAHET Code System and CINDER 90 for APT Applications", Accelerator Production of Tritium Southeast Consortium, start July 1, 1997, \$65,000.

Pending

"Creation of a Set of Benchmark Experiments to Validate the LAHET Code System", Accelerator Production of Tritium Southeast Consortium, \$65,000. Start July 1, 1997. With Farzad Rahnema.

Centers for Disease Control: *Community Education and Training to Address Environmental Health Research Near Department of Energy Nuclear Weapons Facilities*, 1 year, \$179,000.

DOE Health Physics Faculty Research Award Program, Effective Dose Equivalent Personal Dosimeter Development, 1 year, \$49,859.

Concept Papers in Review

"Personal and Area Dosimetry for the APT", Accelerator Production of Tritium Southeast Consortium, \$99,970, FY 97/98. With S.-H. Fong and C.-K. Wang.

"Radiological Hazard Analysis of the Acceleration Production of Tritium Facility", Accelerator Production of Tritium Southeast Consortium, \$128,972, FY 98. With S.-H. Fong and M. T. Ryan.

In collaboration with Dr. Don Burge (WSRC) "Characterization of Neutron and Gamma Radiation Generated by Pu in Vitrified and Ceramic Waste Forms", DOE Plutonium Focus Area, FY 98, \$85,000.

GRADUATE DEGREE SUPERVISION

University of Texas at Austin

Yukitaka Kunimoto: *Waste Stream Toxicities in Thorium Fuel Cycles for Pressurized Water Reactors*, M.S. Thesis, May 1980.

Steven J. Ganthner: *The Effects of Initial Enrichment in the Accelerator Breeding of Nuclear Reactor Fuel*, M.S. Thesis, August 1980.

William E. Murphie: *Measured Neutron and Gamma-Ray Spectra in a Tissue-Equivalent Liquid Irradiated with 14-MeV Neutrons*, M.S. Thesis, December 1980.

Regina M. Laucius: *Calculation of the Differential Efficiencies of Organic Scintillators to Neutrons Above 10 MeV*, M.S. Thesis, May 1983.

Yukitaka Kunimoto: *A Core Inventory Model for Fuel Trajectory Analysis in Fusion-Fission Symbiotic Systems*, Ph.D. Dissertation, August 1983.

Richard D. Savage: *Error Analysis For a Hydrogen Filled Benjamin Counter*, M.S. Thesis, December 1984.

Noreen D. Poor: *A Comparison of Low-Level Radioactive Waste Storage and Disposal Techniques*, M.S. Thesis, August 1985.

Richard S. Hartley: *Neutron Multiplication by Beryllium*, Ph.D. Dissertation, December 1987.

Maureen A. McGraw: *Exposure Assessment for Disposal of Low-Level Radioactive Soil*, M.S. Thesis, December 1989 (Civil Engineering Department, Co-Advisor with Dr. R. J. Charbeneau).

Christine G. Pollard: *Analysis of the Biotic Pathways for a Texas Low-Level Radioactive Waste Disposal Facility*, M.S. Thesis, August 1990 (Biological Sciences, Co-Advisor with Dr. C. McMillan).

Edward Takesuye: *Photon Dose Equivalents in Phantoms*, M.S. Thesis, May 1991.

George A. Miller, Jr.: *Gadolinium Neutron Capture Therapy*, Ph.D. Dissertation (Biomedical Engineering), May 1992.

Bassel K. Nabelssi: *Calculations of Dose Equivalent Quantities for High-Energy Neutrons Using Homogeneous and Heterogeneous Phantoms*, Ph.D. Dissertation, May 1993.

Arnold Preece: *Use of the GENII Computer Code for Dosimetric Pathway Analysis of a Low-Level Radioactive Waste Disposal Facility*, M. S. Thesis, May 1993.

Hector R. Vega-Carrillo: *Characterization of the Neutron Field in the Vicinity of PET Cyclotrons*, Ph.D. Dissertation, May 1995. Co-advisor with Dr. B. W. Wehring.

Georgia Institute of Technology

Timothy H. Fox: *Computer Treatment Planning System and Optimization of Dose Distributions for a Patient Rotator Used in Stereotatic Radiosurgery*, Ph.D. Thesis, March 1994. Co-Advisor with Dr. Kimberly J. Kearfott.

H. Michelle Coward: *Health Risk Assessment of Radioactive Emissions from the Consolidated Incineration Facility at the Savannah River Site*, M.S. Thesis, March 1995.

Edward A. Hoffman: *Low Activation Tokamak Reactors*, M.S. Thesis, September 1995. Co-advisor with Dr. W. M. Stacey, Jr.

John L. Lobdell: *Dose Rate and Spectral Photon Measurements Around a Large BWR Using a Tissue-Equivalent Plastic Scintillation*, Ph.D. Thesis, December 1995.

Karen L. Jones: *A Biokinetic Model for Cs-137 in the Fetus*, Ph.D. Thesis, December 1995. Co-advisor with Dr. Rodney D. Ice.

Frederic J. Mis: *Development of an Imaging Camera for Non-Destructive Examination*, Ph.D. Thesis, March 1996.

Ken Veinot: *Multisphere Neutron Spectra Measurements Near a High Energy Medical Accelerator*, MS Thesis, September 1996.

Jeremy Sweezy: *A Multisphere Neutron Spectrometer Measurement of the Georgia Tech Research Reactor Biomedical Facility*, MS Thesis, September 1996. Co-Advisor with Dr. Patib Karam.

Mary E. Napolitano: *Mammographic X-ray Unit Peak Kilovoltage and Spectral Quality Determination Using Film Densitometry*, Ph.D. Thesis, June, 1997. Co-advisor with Dr. Jon H. Trueblood (Medical College of Georgia).

In Progress:

Luke I. McCormick: *Comparison of Gamma Dose from Discretely and Homogeneously Contaminated Soils*, M.S. Thesis (anticipated September 1997).

Tanya Palmateer Oxenberg: *The Effectiveness of Catch Boxes in Testing Depleted Uranium Projectiles to Minimize the Impact to the Environment*, M.S. Thesis (anticipated September 1997).

Wayne Simpkins: *The Influence of Adipose Tissue on Neutron Dose Equivalent*, Ph.D. Thesis Proposal in Preparation.

PROFESSIONAL ACTIVITIES

American Nuclear Society

Member: *Ad Hoc* Committee on Guidelines for Student Travel Support, Radiation Protection and Shielding Division, American Nuclear Society. 1985 - 1986

Member: Program Committee, Radiation Protection and Shielding Division of the American Nuclear Society, 1987 Topical Meeting on Theory and Practices in Radiation Protection and Shielding. 1985-1987

Member: Program Committee, Radiation Protection and Shielding Division, American Nuclear Society. 1985 - Present

Paper Reviewer: Lithium Blanket Program at the LOTUS Neutron Source Facility, Nuclear Technology Experiments and Facilities, and Fusion Nucleonics Sessions, Seventh Topical Meeting on the Technology of Fusion Energy, American Nuclear Society, Reno, NV. June 1986

Session Organizer/Chairman: *External Dosimetry, Phantoms, and Dose Equivalence*, Radiation Protection and Shielding Division, Winter American Nuclear Society/European Nuclear Society Meeting, Washington, DC. 1988

Member: Executive Committee, Radiation Protection and Shielding Division, American Nuclear Society. 1988 - 1991

Judge: Best Paper, Radiation Protection and Shielding Division, 1988 Winter American Nuclear Society/European Nuclear Society Meeting, Washington, D.C. 1988

| | |
|--|----------------|
| Session Chairman: <i>De Minimis and Below Regulatory Concern</i> , Radiation Protection and Shielding Division, Winter American Nuclear Society Meeting, San Francisco, CA. | 1989 |
| Session Chairman: <i>Radiological Assessments for Decontamination, Decommissioning, and Disposal</i> , Radiation Protection and Shielding Division, Winter American Nuclear Society, Washington, D. C. | 1990 |
| Session Organizer/Chairman: <i>Moderating Neutron Detectors</i> , Radiation Protection and Shielding Division, American Nuclear Society, Winter American Nuclear Society Meeting, San Francisco, CA (organized three sessions, chaired one). | 1991 |
| Judge: Best Paper, Radiation Protection and Shielding Division, 1991 Winter American Nuclear Society Meeting, San Francisco, CA. | 1991 |
| Member: Program Committee, 1992 Topical Meeting -- <i>New Horizons in Radiation Protection and Shielding</i> , Radiation Protection and Shielding Division, American Nuclear Society, Pasco, WA, April 26 - May 1. | 1990 - 1992 |
| Member: <i>Ad Hoc</i> Health Physics Society Liaison Committee, Radiation Protection and Shielding Division, American Nuclear Society. | 1991 - 1996 |
| Session Chairman: <i>Radiation Sources and Dosimetry</i> , 1992 Topical Meeting -- New Horizons in Radiation Protection and Shielding, Radiation Protection and Shielding Division, American Nuclear Society, Pasco, WA, April 26 - May 1. | 1992 |
| Technical Program Chairman: Eighth International Conference on Radiation Shielding (Sponsored by the Radiation Protection and Shielding Division, American Nuclear Society), Arlington, TX, April 24 - 27. | 1994 |
| Judge: Best Paper Award, Radiation Protection and Shielding Division, Winter Meeting, Chicago, IL. | 1992 |
| Vice Chair, Radiation Protection and Shielding Division, American Nuclear Society. | 1994 - 1995 |
| Judge, Best Paper Award, Radiation Protection and Shielding Division, American Nuclear Society, Winter Meeting, Washington, D.C. | 1994 |
| Session Organizer (2 Sessions)/Chair (1 Session), <i>Photon and Electron Transport Methods and Applications I and II</i> , Radiation Protection and Shielding Division, American Nuclear Society, Winter Meeting, San Francisco, CA. | 1995 |
| Chair, Radiation Protection and Shielding Division, American Nuclear Society. | 1995 - 1996 |
| Judge, Best Paper Award, Radiation Protection and Shielding Division, American Nuclear Society, Winter Meeting, San Francisco, CA. | 1995 |
| Member, Everitt P. Blizard Scholarship Committee, Radiation Protection and Shielding Division, American Nuclear Society. | 1995 - 1997 |
| Session Chairman, <i>Computational Methods for Medical Applications</i> , 1996 Topical Meeting, <i>Achievements and Applications in Radiation Protection and Shielding</i> , Radiation Protection and Shielding Division, American Nuclear Society, North Falmouth, MA, April 21-25, 1996. | 1994 - 1996 |
| Chair, Nominating Committee, Radiation Protection and Shielding Division | 1996 |
| Member, Program Committee, Accelerator Applications Technical Group, American Nuclear Society | 1996 - present |

American Nuclear Society (Continued)

Member, Technical Program Committee, 1998 American Nuclear Society, Radiation Protection and Shielding Division Topical Meeting, Technologies for the New Century, Nashville, TN, April 12-23, 1998. 1996 - 1998

Atlanta Local Section

Vice Chair, Atlanta Local Section, American Nuclear Society. 1995 - 1996

Chair, Atlanta Local Section, American Nuclear Society 1997 - 1998

Health Physics Society

Member: National Standards Committee, Health Physics Society. 1989 - 1995

Paper Reviewer: *Health Physics Journal*. 1990 - 1993, 1995

Member, Academic Program Committee, Health Physics Society. 1996 - 1999

Local Chapter

Member: Publications Committee, South Texas Chapter of Health Physics Society. 1986 - 1989

Vice President, South Texas Chapter of the Health Physics Society. 1995 - 1996

President, Atlanta Chapter of the Health Physics Society 1996 - 1997

Department of Energy

Invited Participant: 11th Department of Energy Workshop on Personnel Neutron Dosimetry, Las Vegas, NV, June 4-7. 1991

Proposal Reviewer: Applied Health Physics Program, Department of Energy, EH - 41. 1992

DOE Program Reviewer: Effective Dose Equivalent Dosimeter System Tests, Applied Health Physics Research Program, Battelle Pacific Northwest National Laboratories. 1993

Proposal Reviewer: DOE Environmental Restoration and Waste Management Junior Faculty Award Program. 1993

Panel Moderator and Reviewer: Health Sciences Merit Review Panel, Department of Energy's Environmental Management Science Program Proposal Review. 1997

Other

Reviewer: National Science Foundation. 1982, 1985

Member: Local Program Committee, IEEE 11th Symposium on Fusion Engineering, Austin, TX, November 18-22. 1985

Co-Chairman: Poster Session: *Engineering Problems of Future Fusion Reactors: Experimental and Diagnostics Systems Design*, IEEE 11th Symposium on Fusion Engineering, Austin, TX, November 18-22. 1985

Other (Continued)

| | |
|--|----------------|
| Expert Witness: Texas Senate Committee on NORM and NARM Waste Hearing, San Antonio, TX, October 5. | 1989 |
| Paper Reviewer, <i>Medical Physics Journal</i> . | 1993 - 1996 |
| Roster, International Atomic Energy Agency's Experts Program. | 1994 - present |
| Battelle Pacific Northwest National Laboratory Affiliate Staff Scientist. | 1994 - present |
| Paper Reviewer, <i>Nuclear Instruments and Methods Journal</i> | 1995 |
| Visiting Scientist, Los Alamos National Laboratory | 1996 - 1998 |

TEACHING

Short Courses:

Basic Radiological Health Course: Texas Department of Health, Bureau of Radiation Control, 1981.

Techniques in Nuclear Radiation Shield Analysis (UTT): June 1987, October 1988, September 1989, May 1990, July 1992, July 1993. (Organizer)

BRC Radwaste Disposal (Below Regulatory Concern): February 1988, November 1988, October 1989. (Organizer)

Georgia Institute of Technology

Lecture 3.7, Treatment of Gaseous Waste, International Atomic Energy Agency: Interregional Training Course on Management of Radioactive Waste from Nuclear Power Plants, Argonne National Laboratory, August 1993.

Basic Health Physics Course, Westinghouse Savannah River Company, March - April, 1994.

THE UNIVERSITY OF TEXAS AT AUSTIN

Undergraduate Courses:

| | |
|---------------|--|
| ME 319 | Mechanical Engineering Computations |
| ME 337C | Introduction to Nuclear Power Systems |
| ME 337D | Radiation and Radiation Protection |
| ME 339 | Heat Transfer and Rate Processes |
| ME 361E | Nuclear Reactor Engineering |
| ME 361F | Nuclear Engineering: Introductory Laboratory |
| ME 445 | Fluid Mechanics |
| ME 177K, 377K | Projects in Mechanical Engineering |
| ME 379M | Introduction to Health Physics |

Graduate Courses:

| | |
|-----------|--|
| ME 380M | Research |
| ME 388Q.1 | Nuclear Reactor Theory I |
| ME 388Q.2 | Nuclear Reactor Theory II |
| ME 388Q.3 | Analytical and Numerical Techniques in Reactor Engineering |
| ME 388Q.4 | Neutron and Nuclear Physics |
| ME 388R.1 | Nuclear Radiation Shielding |
| ME 389R.1 | Nuclear Engineering Laboratory |
| ME 397.1 | Projects |
| ME 397K | Nuclear Engineering Graduate Seminar |

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|------------|--|
| ME 397.26 | Nuclear Engineering Health Physics |
| ME 397.9 | Nuclear Fuel Cycles |
| ME 698A | Thesis |
| ME 698B | Thesis |
| BIOI. 698B | Thesis (Biological Sciences Graduate Program) |
| MI 99W | Dissertation Research |
| BME999R | Dissertation Research (Biomedical Engineering Program) |

THE GEORGIA INSTITUTE OF TECHNOLOGY

Undergraduate Courses

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| NE 1100 | Energy and Engineers in Society |
| NE 4803 | Special Topics: Radioactivity in the Environment |
| HP 4412 | Principles of Health Physics |
| ME 2016 | Computer Applications |

Graduate Courses

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| HP 6405 | Health Physics Practice |
| HP 6641 | Environmental Surveillance and Waste Disposal |
| NE 6126 | Monte Carlo Methods in Nuclear Engineering |
| NE 6132 | Nuclear Fuel Management |
| NE 6261 | Radiation Shielding Design |
| NE/HP 6753 | Advanced Nuclear/Radiological Engineering Design |
| NE/HP 6751 | Advanced Radiation Detection |
| HP 8113 | Special Topics: Radiological Assessment |

PUBLICATIONS

1. "Fast Neutron Spectra for the TAMVEC 50-MeV d^+ -Be Neutron Treatment Beam" (abstract), *Med. Phys.*, **2**, 152 (1975). With V. A. Otte, J. B. Smathers, A. R. Smith and P. R. Almond.
2. "Thick Target Yields from D^+ -Be Reactions at $E_d=16, 30$ and 40 MeV", *Symposium on Neutron Cross-Sections 10-40 MeV*, BNL-NCS-50681, Brookhaven National Laboratory, New York, May 1977. With R. G. Graves, J. B. Smathers, V. A. Otte, P. R. Almond and W. Grant.
3. "Photoneutron and Cf-252 Neutron Dose Comparisons for Radiotherapy Shielding", *Trans. Am. Nucl. Soc.*, **28**, 620 (1978). With B. W. Wehring.
4. "Comparison of VITAMIN-C Master Library Reaction Cross Sections for Iron with Multigroup Cross Sections Generated by the VIM Monte Carlo Code", *Proceedings of the RSIC Seminar-Workshop on Multigroup Nuclear Cross-Section Preparation and Data Library Manipulation Techniques*, March 14-16, 1978, Oak Ridge, Tennessee, ORNL-RSIC-41. With B. W. Wehring and R. H. Johnson.
5. "Effectiveness of Tungsten and Lead in Attenuation of Photoneutrons" (abstract), *World Federation in Nuclear Medicine and Biology Second International Congress*, September 17-21, 1978, Washington, DC. With R. Mertogul and B. W. Wehring.
6. "Integral Tests of ENDF/B-IV High-Energy Neutron Cross Section Data for Tungsten", *Trans. Am. Nuc. Soc.*, **32**, 631 (1979). With B. W. Wehring and J. J. Dorning.
7. "TLD Measurements in an Iron Sphere Containing a DT Source", *Trans. Am. Nuc. Soc.*, **32**, 632 (1979). With R. H. Johnson, K. R. Koch and B. W. Wehring.
8. "Benchmark Shielding Problems Obtained from Integral Tests of Neutron Cross Sections", *Trans. Am. Nuc. Soc.*, **33**, 666 (1979). With B. W. Wehring, J. J. Dorning, D. T. Ingersoll and R. H. Johnson.

9. "Measurements and Analyses of Neutron Transport Through Iron", *Proceedings of the International Conference on Nuclear Cross Sections for Technology*, Knoxville, Tennessee, 1979, NBS Special Publication 594, pp. 563-567. With R. H. Johnson, J. J. Dornring and B. W. Wehring.
10. "Absolute Monitoring of DD and DT Neutron Fluences Using the Associated Particle Technique", *Nucl. Instr. Meth.*, 172, 501 (1980). With B. W. Wehring.
11. "Gamma-Ray Spectra Measured in Tissue-Equivalent Medium Irradiated with Neutron Radiotherapy Sources", *Trans. Am. Nuc. Soc.*, 35, 457 (1980). With J. B. Smathers and R. G. Graves.
12. "In Phantom Photon Spectra Measurements for High-Energy Neutron Therapy Sources", *Proceedings: Fourth Symposium on Neutron Dosimetry*, June 1-5, 1981, Neuherberg/Munchen, Federal Republic of Germany, EUR 7448en. With J. B. Smathers and R. G. Graves.
13. "Measurements of Neutron and Gamma-Ray Spectra in a Phantom Irradiated with 14-MeV Neutrons" (abstract), 26th Annual Meeting of the Health Physics Society, Louisville, Kentucky, *Health Physics*, 41, 887 (1981). With W. E. Murphie and R. J. Calhoun.
14. "A Core Inventory Model for Fuel Trajectory Analysis in Fusion-Fission Symbiotic Systems", *Trans. Am. Nuc. Soc.*, 41, 178 (1981). With Y. Kunimoto and J. W. Davidson.
15. "Calculation of the Differential Efficiencies of Organic Scintillators to Neutrons Above 10 MeV", *Trans. Am. Nuc. Soc.*, 43, 625 (1982). With R. M. Laucius and J. W. Davidson.
16. "The Use of Neutron and Gamma-Ray NE-213 Spectral Measurements and Calculations to Obtain Dosimetric Information for DT Neutrons", *Med. Phys.*, 10, 66 (1983). With W. E. Murphie.
17. "Bonner Ball Detection Responses for Neutrons from Thermal Energies to 17.3 MeV" (abstract), Health Physics Society Annual Meeting, Baltimore, Maryland, *Health Physics*, 45, 192 (1983). With J. W. Davidson.
18. "NE-213 Response Matrix for Neutron Spectrometry Up to 50-MeV" (abstract), Health Physics Society Annual Meeting, Baltimore, Maryland, *Health Physics*, 45, 192 (1983). With J. W. Davidson and R. M. Laucius.
19. "An NE-213 Response Matrix to 50 MeV", *Trans. Am. Nuc. Soc.*, 45, 607 (1983). With J. W. Davidson and R. M. Laucius.
20. "An Equal Probability Neutron Detection System Using Bonner Spheres", *Trans. Am. Nuc. Soc.*, 45, 609 (1983). With J. W. Davidson.
21. "The Effect of Cadmium Covers on Bonner Sphere Responses", (abstract) *Proceedings of the Personnel Radiation Dosimetry Symposium*, Knoxville, Tennessee, October 1984. With J. W. Davidson.
22. "The Response of Bonner Spheres from Thermal Energies to 17.3 MeV", *Nucl. Instr. Meth.*, A238, 509 (1985). With J. W. Davidson.
23. "A Comparison of Low-Level Radioactive Waste Management Alternatives" *Proceedings of the Waste Management '85 Conference*, Tucson, Arizona, (1985). With N. D. Poor.
24. "A Comparison of Low-Level Radioactive Waste Storage and Disposal Alternatives" (abstract), Health Physics Society Annual Meeting, Chicago, Illinois, (1985). With N. D. Poor.
25. "Transmission of Fast Neutrons through an Iron Sphere", *Fusion Tech.*, 9, 345 (1986). With R. H. Johnson, J. J. Dornring and B. W. Wehring.
26. "Calibration of Bonner Spheres at The University of Texas" (abstract), Health Physics Society Annual Meeting, Pittsburgh, Pennsylvania, *Health Physics*, 50, Suppl. 1, 522 (1986). With A. D. Gaines.

27. "How to Evaluate a Low-Level Radioactive Waste Disposal Technology", (abstract), Health Physics Society Annual Meeting, Pittsburgh, Pennsylvania, *Health Physics*, 50, Suppl. 1, 568 (1986). With N. D. Poor.
28. "Dosimetry in the Vicinity of TEXT", Proceedings of the 20th Midyear Symposium of the Health Physics Society, *Health Physics of Radiation Generating Machines*, Reno, February 1987, CONF-8602106 With H. W. Bryant, T. L. Bauer and J. W. Jagger.
29. "Neutron Measurements in the Vicinity of Medical Electron Accelerators", Proceedings of the 20th Midyear Symposium of the Health Physics Society, *Health Physics of Radiation Generating Machines*, Reno, February 1987, CONF-8602106. With R. S. Hartley, T. L. Bauer, J. L. Horton and V. A. Otte.
30. "Neutron Multiplication in Beryllium", *Trans. Am. Nuc. Soc.*, 54, 126 (1987). With R. S. Hartley.
31. "Determining Calibration Factors for Bonner Spheres", *Trans. Am. Nucl. Soc.*, 55, 220 (1987). With R. S. Hartley and A. D. Gaines.
32. "Transportation Worker Exposure from the Transport of BRC Radwaste", *Proceedings of the Waste Management '88 Symposium*, Tucson, February 28-March 3, 1988. With C. G. Pollard and B. A. Gantner.
33. "Calculations of Dosimetric Quantities for Cf-252 Neutron Sources", (abstract), 1988 Health Physics Society Annual Meeting, Boston, Massachusetts, *Health Physics*, 54, S46 (1988). With J. C. McDonald.
34. "Measured and Calculated Neutron Leakage Multiplication for Beryllium Shells", *Trans. Am. Nucl. Soc.*, 56, 123 (1988). With R. S. Hartley and J. W. Davidson.
35. "Analysis of the Texas Beryllium Neutron Leakage Multiplication Experiments", (abstract) Eighth Topical Meeting on the Technology of Fusion Energy, Salt Lake City, Utah, October 9-13, 1988. With J. W. Davidson and R. S. Hartley.
36. "Dose Equivalent and Phantoms in Conventional Calibration Practice", *Trans. Am. Nucl. Soc.*, 57, 219 (1988). With J. C. McDonald.
37. "Neutron Multiplication in Beryllium", *Fusion Engr. Des.*, 10, 133 (1989). With R. S. Hartley and J. W. Davidson.
38. "Nuclear Radiation Analysis in the IGNITEX Ignition Experiment", *Fusion Tech.*, 15, 459 (1989). With T. Parish and R. Carrera.
39. "Ignition Experiment in a Single-Turn-Coil Tokamak", *Fusion Tech.*, 15, 402 (1989). With R. Carrera, M. Driga, J. H. Gully, J. Hopf, K. T. Hsieh, E. Montalvo, C. Ordonez, T. Parish, M. N. Rosenbluth, W. A. Walls, W. F. Weldon, M. Werst and H. H. Woodson.
40. "IGNITEX Experiment", (abstract) *16th IEEE International Conference on Plasma Science*, Buffalo, New York, May, 1989, IEEE-89-CH-2760-7, 58 (1989). With R. Carrera, M. Barrington, R. Bickerton, W. D. Booth, Y. Chen, J. Dong, M. Driga, S. Eways, G. Fu, J. Gully, G. Hallock, J. Helton, L. Hivey, J. Howell, K. Hsieh, J. Ling, G. Miller, E. Montalvo, C. Ordonez, D. Palmrose, T. Parish, M. Rosenbluth, S. Tamor, D. Tesar, J. Van Dam, P. Varghese, A. Walls, W. Weldon, M. Werst and H. Woodson.
41. "Nuclear Radiation Analysis of the IGNITEX Experiment", (abstract) *16th IEEE International Conference on Plasma Science*, Buffalo, New York, May, 1989, IEEE-89-CH-2760-7, 59 (1989). With D. Palmrose, T. Parish, R. Carrera and G. Miller.
42. "Environmental Monitoring at the Potential Low-Level Radioactive Waste Disposal Site in Texas", (abstract), 1989 Health Physics Society Annual Meeting, Albuquerque, New Mexico, *Health Physics*, 56, Suppl. 1, S68 (1989). With C. G. Pollard and J. Maldonado.

43. "New Dose Equivalent Quantities: Possible Directions for Neutron Dosimetry", 1989 Health Physics Society Annual Meeting, Albuquerque, New Mexico, *Invited Talk* in Special Session on the Implementation of the ICRU-39 Dose Equivalent Quantities.
44. "The Impact of Dose Rates Due to Decay Photons on the Design of the IGNITEX Device", *Proceedings of the 13th International Symposium on Fusion Engineering*, Knoxville, Tennessee, October 2 - 6, 1989. With D. E. Palmrose, T. A. Parish and R. Carrera.
45. "Preliminary Analysis of Radiological Hazards for the Fusion Ignition Experiment IGNITEX", *Proceedings of the 13th International Symposium on Fusion Engineering*, Knoxville, Tennessee, October 2 - 6, 1989. With T. A. Parish, B. Shofolu, R. Carrera, R. Charbeneau, D. Klein and S. Fetter.
46. "Multidimensional Radiation Analysis for the Fusion Ignition Experiment IGNITEX", *Proceedings of the 13th International Symposium on Fusion Engineering*, Knoxville, Tennessee, October 2 - 6, 1989. With G. A. Miller, R. Carrera and T. A. Parish.
47. "Calculations of Anisotropy Factors and Dose Equivalents for Unmoderated Cf-252 Sources", *Radiation Protection Dosimetry*, 32, 77 (1990). With J. C. McDonald.
48. "Performance Assessment of the Potential Low-Level Radioactive Waste Disposal Site in Texas", *Proceedings of the Waste Management '90 Symposium*, Tucson, Arizona, February 25 - March 1, 1990. With R. J. Charbeneau, M. Becker and C. G. Pollard.
49. "Texas Low-Level Radioactive Waste Disposal Site Performance Assessment", (abstract) 1990 Health Physics Society Annual Meeting, Anaheim, California, June 24-28, 1990, *Health Physics*, 58 Suppl. 1, S35 (1990). With R. J. Charbeneau, M. Becker and C. G. Pollard.
50. "Benchmarking Shield Calculations for 46-MeV (p,Be) Neutron Sources with Bonner Sphere Measurements", (abstract) 1990 Health Physics Society Annual Meeting, Anaheim, California, June 24-28, 1990, *Health Physics*, 58 Suppl. 1, S53 (1990). With J. Smathers and L. Meyers.
51. "Bonner Sphere Neutron Measurements of the Environments Created by a 46-MeV (p,Be) Neutron Therapy Facility", (abstract) 1990 Health Physics Society Annual Meeting, Anaheim, California, June 24-28, 1990, *Health Physics*, 58 Suppl. 1, S53 (1990). With J. Smathers and L. Meyers.
52. "Assessment of Structural Activation in the Operation of the Fusion Ignition Experiment IGNITEX", (abstract) 1990 IEEE International Conference on Plasma Science, IEEE-90-CH (1990). With D. E. Palmrose, T. A. Parish and R. Carrera.
53. "Neutron Streaming Analysis in the Fusion Ignition Experiment IGNITEX", (abstract) 1990 IEEE International Conference on Plasma Science, IEEE-90-CH (1990). With T. Parish, B. Shofolu, W. D. Booth and R. Carrera.
54. "Performance Assessment for Radwaste Disposal", *Proceedings of the National Conference on Environmental Engineering*, American Society of Civil Engineers, Arlington, VA, July 9 - 11, 1990, p. 65-72. With R. J. Charbeneau, C. G. Pollard and M. Becker.
55. "Texas' Performance Assessment Work", *Twelfth Annual DOE Low-Level Waste Management Conference*, Chicago, IL, August 28-29, 1990. With R. J. Charbeneau and C. G. Pollard.
56. "Biotic Pathways for a Texas Low-Level Radioactive Waste Disposal Facility", *Trans. Am. Nucl. Soc.*, 62, 468 (1990). With C. G. Pollard, R. J. Charbeneau and M. Becker.
57. "Atmospheric Dispersion Doses for a Texas Low-Level Radioactive Waste Disposal Site", *Trans. Am. Nucl. Soc.*, 62, 469 (1990). With B. Nabelssi, R. J. Charbeneau and C. G. Pollard.
58. "Modeling a Roll-Off Container Transportation Worker Dose Scenario for BRC Radwaste", *Trans. Am. Nucl. Soc.*, 62, 460 (1990). With W. G. Lovely, J. R. Jupena and C. G. Pollard.

59. "Methods for the Calibration of Photon Personnel Dosimeters in Terms of the Ambient Dose Equivalent", *Radiation Protection Dosimetry*, 32, 149 (1990). With J. C. McDonald.
60. "Evaluation of Radiation Streaming Effects in A Single-Turn Ignition Tokamak", *Fusion Tech.*, 19, 1938 (1991). With Y. Watanabe, T. A. Parish, W. D. Booth, R. Carrera and B. Shofolu.
61. "Calculated Dosimetric Quantities for D₂O-Moderated Cf-252 Sources", *Radiation Protection Dosimetry*, 35, 23 (1991). With J. C. McDonald.
62. "Methods for the Calibration of Neutron Personnel Dosimeters in Terms of the Ambient Dose Equivalent", *Radiation Protection Dosimetry*, 37, 149 (1991). With J. C. McDonald.
63. "Neutron Fluence to Dose Conversion Factors: Which Ones?", Eleventh DOE Workshop on Personnel Neutron Dosimetry, June 3-7, 1991, Las Vegas, NV, CONF-9106235 (PNL-SA-21596).
64. "Performance Assessment of Normal Release Scenarios at a Potential Texas Low-Level Radioactive Waste Disposal Site", (abstract), 1991 Summer Meeting of the Health Physics Society, Washington, D. C., July 21-26, 1991, *Health Physics*, 60 Suppl. 2, S45 (1991). With C. G. Pollard and R. J. Charbeneau.
65. "Estimating Skyshine Doses at the Boundaries of Low-Level Radioactive Waste Disposal Facilities Due to Partially Covered Wastes", (abstract), 1991 Summer Meeting of the Health Physics Society, Washington, D. C., July 21-26, 1991, *Health Physics*, 60 Suppl. 2, S46 (1991). With B. L. Hall, R. J. Charbeneau and C. G. Pollard.
66. "Zinalco and Zircaloy-4 Nuclear Characterization", *J. Radioanal. Nucl. Chem.*, 150, 1 (1991). With H. R. Vega Carrillo, C. Rios Martinez, L. L. Quirino Torres and F. Iskander.
67. "Application of Bonner Sphere Spectrometer in Californium-252 Spectrometry", *Revista Mexicana de Fisica*, 37, 659 (1991). With H. R. Vega Carrillo, C. R. Martinez and L. L. Quirino Torres.
68. "Bonner Sphere Measurements of a D₂O-Moderated ²⁵²Cf Source", *Trans. Am. Nucl. Soc.*, 64, 472 (1991). With R. C. Woodard, H. R. Vega Carrillo and B. W. Wehring.
69. "Experience Using a Seven Ball Bonner Sphere System to Measure Neutrons in the Energy Range 1-44 MeV", *Proceedings of the New Horizons in Radiation Protection and Shielding Topical Meeting*, American Nuclear Society Radiation Protection and Shielding Division, Pasco, Washington, April 26 - May 1, 1992. With J. B. Smathers and L. T. Myers.
70. "Validation of Beryllium Neutron Multiplication Cross Sections for ENDF/B-V", *Proceedings of the New Horizons in Radiation Protection and Shielding Topical Meeting*, American Nuclear Society Radiation Protection and Shielding Division, Pasco, Washington, April 26 - May 1, 1992. With R. S. Hartley and J. W. Davidson.
71. "Calibration of Personal Dosimeters in Terms of the ICRU Operational Quantities", *Proceedings of the 8th Congress of the International Radiological Protection Association*, Montreal, Canada, May 17-22, 1992. With J. C. McDonald.
72. "Algorithm Development for the Integrated Radiation Mapper Assistant", (abstract), 37th Annual Health Physics Society Meeting, Columbus, Ohio, June 21-25, 1992, *Health Physics*, 62, Suppl. 1, 551 (1992). With N. M. Schaeffer, R. Carlton and L. Tripp.
73. "Neutron Spectra Measured in the Vicinity of a PET Cyclotron", Works-in-Progress presentation at the 37th Annual Health Physics Society Meeting, Columbus, Ohio, June 21-25, 1992. With H. R. Vega Carrillo, B. K. Nabelssi, B. W. Wehring, C. A. Shriver, C. E. Johannes and P. A. Jerabek.
74. "Gadolinium Neutron Capture Therapy", *Nuclear Technology*, 103, 320-331 (1993). With G. A. Miller, B. W. Wehring and J. L. Horton.

75. "Ambient Dose Equivalents, Effective Dose Equivalents, and Effective Doses for Neutrons from 10 to 20 MeV", *Radiation Protection Dosimetry*, 48, 153-168 (1993). With B. K. Nabelssi.
76. "Effective Dose Equivalents and Effective Doses for Neutrons from 30 to 180 MeV", *Radiation Protection Dosimetry*, 48, 227-243 (1993). With B. K. Nabelssi.
77. "Calculations of Dose Equivalent Quantities for High-Energy Neutrons Using Homogeneous and Heterogeneous Phantoms", (abstract) 38th Annual Meeting of the Health Physics Society Meeting, Atlanta, GA, July 1993, *Health Physics*, 64, Suppl. 1, S48 (1993). With B. K. Nabelssi.
78. "AFITBUNKI: A Modified Iterative Code to Unfold Neutron Spectra from Bonner Sphere Data, (abstract) 38th Annual Meeting of the Health Physics Society, Atlanta, GA, July 1993, *Health Physics*, 64, Suppl. 1, S48 (1993). With S. C. Miller and R. S. Hartley.
79. "Determination of Thermalized Neutron Flux Inside a PET Cyclotron Vault Room", Proceedings of II Congreso Regional de Seguridad Radiologica y Nuclear, Zacatecas, Mexico, pp. 705-707, November 22-26, 1993. With H. R. Vega-Carrillo and B. W. Wehring.
80. "Ambient Dose Equivalent, Deep Dose Equivalent Index, and ICRU Sphere Depth-Dose Calculations for Neutrons from 30 - 180 MeV", *Radiation Protection Dosimetry*, 51, 169-182 (1994). With B. K. Nabelssi.
81. "Room Characterization", *Proceedings of 8th International Conference on Radiation Shielding*, pp. 1098-1102, Arlington, Texas, April 24-28, 1994. With O. J. Lessard, R. S. Hartley, D. C. Moss and C. R. Brennan.
82. "Experimental Characterization of the AFIT Neutron Facility", (abstract) 29th Annual Meeting of the Health Physics Society, San Francisco, CA, June 26-30, 1994, *Health Physics*, 66, Suppl. 1, S80 (1994). With O. J. Lessard, R. L. Hartley, D. C. Moss and C. R. Brennan.
83. "Neutron Dosimetry with ²⁵²Cf-Iron Assemblies", *Radiation Protection Dosimetry*, 58, 283 - 287 (1995). With T. L. Johnson, Y. Lee and J. C. McDonald.
84. "The Georgia Tech Health Physics Program: Building on a Tradition of Excellence", 28th Midyear Topical Meeting of the Health Physics Society, *Health Physics Training and Education*, January 29 - February 1, 1995. With W. J. Wepfer.
85. "The Georgia Tech MS HP Video Program", 28th Midyear Topical Meeting of the Health Physics Society, *Health Physics Training and Education*, January 29 - February 1, 1995. With J. S. Boland and W. J. Wepfer.
86. "Dependence of Fusion Activated Wastes on Material Properties and on Physics and Technological Constraints", *J. Fusion Engineering Design*, 29, 198-206 (1995). With W. M. Stacey and E. A. Hoffman.
87. "Air Emissions Estimate for the Savannah River Site Consolidated Incinerator Facility", *Proceedings of the 1995 Incineration Conference*, May 8-12, 1995, Seattle, WA. With M. G. Robinson, J. A. Mulholland, D. Burge and H. M. Coward.
88. "Health Risk Assessment for the Savannah River Consolidated Incinerator Facility", *Proceedings of the 1995 Incineration Conference*, May 8-12, 1995, Seattle, WA. With H. M. Coward, M. G. Robinson, J. A. Mulholland and D. Burge.
89. "Savannah River Site Consolidated Incineration Facility Health Risk Assessment", (Abstract) Health Physics Society - American Association of Physicists in Medicine Joint Annual Meeting, July 23 - 29, 1995, Boston, MA, *Health Physics* 68, Suppl. 1, S11 (1995). With H. M. Coward, T. M. Evans, M. G. Robinson, J. A. Mulholland and D. A. Burge.
90. "Mammographic X-Ray Beam Peak Determination Using Film Densitometry", Health Physics Society - American Association of Physicists in Medicine Joint Annual Meeting, July 23 - 29, 1995, Boston, MA. With M. E. Napolitano and J. H. Trueblood.

91. "Use of ITS to Develop a Methodology for Determining Mammographic X-ray Spectrum Endpoint Energies", *Trans. Am. Nucl. Soc.* 73, 342 (1995). With M. E. Napolitano and J. Trueblood.
92. "A Tissue Equivalent Detector Photon Response Matrix", *Trans. Am. Nucl. Soc.* 73, 343 - 345 (1995). With J. L. Lobdell.
93. "Paired Thermoluminescent Dosimeter Technique in Bonner Sphere Spectrometry", *Trans. Am. Nucl. Soc.* 73, 356 - 358 (1995). With H. R. Vega-Carrillo, A. J. Teachout and B. W. Wehring.
94. "Radwaste Disposal of Fusion DEMOS", Proceedings of the 12th Topical Meeting on the Technology of Fusion Energy, American Nuclear Society, Reno, NV, June 16-20, 1996. With E. A. Hoffman and W. M. Stacey.
95. "Dose Rate and Spectral Measurements Around a Large BWR", 1996 Health Physics Meeting, Seattle, WA, July 22-26, 1996, *Health Physics* 70, Suppl. 1, S89 (1996) (Abstract). With J. L. Lobdell.
96. "Radiological Assessment of a Mixed Waste Incinerator". With T. M. Evans, J. A. Mulholland, H. M. Coward and D. A. Burge. (Won the Radiation Protection & Shielding Division's Best Paper Award, Winter 1996 Meeting.) *Trans. Amer. Nucl. Soc.* 75, 306-307 (1996)
97. "Radioactive Waste Disposal Characteristics of Candidate Tokamak Demonstration Reactors", *Fusion Technology*, 31, 35-61 (1997). With E. A. Hoffman and W. M. Stacey.
98. "Neutron Field Characterization in the Vicinity of a PET Cyclotron", Proceedings of the 13th Midyear Topical Meeting of the Health Physics Society: Health Physics of Radiation Generating Machines, San Jose, CA, January 5-8, 1997, pp. 461 - 469 (1997). With H. R. Vega-Carrillo, A. J. Teachout, B. W. Wehring and P. Jerabek.
99. "Photon Spectra and Dose Measurements Using a Tissue-Equivalent Plastic Scintillator", accepted for publication as a technical paper in *Radiation Protection Dosimetry Journal*. With John L. Lobdell. (July 1996).
100. "Dose Rate Measurements in ¹⁴N and Non-¹⁴N Gamma-Ray Fields", Revised Manuscript in review for publication as a technical paper in *Radiation Protection Dosimetry*. With John L. Lobdell. (June 1997)
101. "Biokinetic Model for ¹³⁷Cs in the Fetus", accepted for publication as a technical paper in *Health Physics*. With K. L. Jones and R. D. Ice.
102. "Revision of Georgia Tech's BNE Degree to a BNRE Degree", accepted for presentation at the 1997 Annual Summer Meeting of the American Nuclear Society, Orlando, FL, June 1-5, 1997.
103. "Neutron Spectral Characteristics of the Georgia Tech Research Reactor Bio-Medical Facility", with J. Sweezy, accepted as an oral presentation at the 1997 Health Physics Society Annual Meeting, June 29-July 3, 1997, San Antonio, TX.
104. "Benchmarking the LAHET Elastic Scattering Model", accepted for presentation at the 1997 ANS Embedded Topical Meeting on Accelerator Applications, Albuquerque, NM, November 16-20, 1997. With T. M. Evans, H-H. Hsu, L. Waters, R. E. Prael and M. V. Gregory.
105. "Multisphere Neutron Spectral Measurements Near a High-Energy Medical Accelerator", submitted to *Health Physics Journal* for publication as a technical paper (June 1997). With K. G. Veinot and K. W. Brooks.

REPORTS AND OTHER PUBLICATIONS

1. "Glovebox Operations—Advanced", Module 25-2, *Radioactive Material Handling Techniques*, Texas Education Research Center Nuclear Technology Series, 1980.
2. "Precipitation Techniques and Centrifugation", Module 23-4, *Nuclear Chemical Processes*, Texas Education Research Center Nuclear Technology Series, 1980.

3. Progress Report: NSF Grant CPE-8006674, *Research Initiation: High-Energy Neutron Transport Studies*, 1981.
4. Final Technical Description: NSF Grant CPE-8006674, *Research Initiation: High-Energy Neutron Transport Studies*, 1983.
5. Progress Report: NSF Grant CPE-8412072, *Neutron Multiplication by Beryllium*, 1985.
6. Final Report: NSF Grant CBT-8412072, *Neutron Multiplication By Beryllium*, 1988.
7. *Analysis of the Texas Beryllium Neutron Multiplication Experiment*, with J. W. Davidson and R. S. Hartley, Los Alamos National Laboratory, LA-UR-88-3427, 1988.
8. *Radiation Mapping Algorithm Development: Task 1. Source Strength Algorithm*, with N. M. Schaeffer, Schaeffer Associates for Odetics, SA-T9101, 1991.
9. *Radiation Mapping Algorithm Development: Task 2. Volume Radiation Maps, Task 3. Scatter Corrections*, with N. M. Schaeffer, Schaeffer Associates for Odetics, SA-T9102, 1991.
10. *Non-Academic Nuclear Training in the United States: A Survey*, with Robert C. Woodard and N. M. Schaeffer, Schaeffer Associates for Century Research Center Corporation, SA-T9103, 1991.
11. *Neutron Shielding Analysis for the University of Texas Health Science Center at San Antonio Research Imaging Center PET Cyclotron*, Nuclear Engineering Teaching Laboratory Technical Report, The University of Texas at Austin, UT-NETL-NH-T9201, 1992.
12. *Performance Assessment for the Texas Low-Level Radioactive Waste Disposal Facility*, with R. J. Charbeneau and C. G. Pollard, Center for Research in Water Resources, Bureau of Engineering Research, The University of Texas at Austin, Tech-Report CRWR 243, 1993, 115 pp.
13. *Extrapolation to a Demonstration Reactor from the ITER and Advanced Physics and Materials Data Bases*, Fusion Research Center and Nuclear Engineering Program, Georgia Institute of Technology, GTFR 113, April 1994. With W. M. Stacey and E. A. Hoffman.
14. *Dose Comparison for Air Emissions from the Incineration and Compaction of SRS Low-Level Radioactive Job Control Wastes*, Technical Report Prepared for Westinghouse Savannah River Company under ERDA Task Order 94-041, GT/ERDA-94041-001, Rev. 1, October 1994, 29 pp. With H. M. Coward, J. A. Mulholland and M. G. Robinson.
15. *Air Emissions Estimate for the Savannah River Site Consolidated Incinerator Facility, Part 1: Metal and Radionuclide Emissions*, Technical Report Prepared for Westinghouse Savannah River Company under ERDA Task Order 94-041, GT/ERDA-94041-002, Rev. 3, April 1995, 45 pp. With J. A. Mulholland, M. G. Robinson, H. M. Coward and D. I. Nakahata.
16. *Air Emissions Estimate for the Savannah River Site Consolidated Incinerator Facility, Part 2: Organic Emissions*, Technical Report Prepared for Westinghouse Savannah River Company under ERDA Task Order 94-041, GT/ERDA-94041-003, Rev. 3, April 1995, 40 pp. With J. A. Mulholland, M. G. Robinson and H. M. Coward.
17. *Doses from Estimated Air Emissions for the Savannah River Site Consolidated Incineration Facility*, Technical Report Prepared for Westinghouse Savannah River Company under ERDA Task Order 94-041, GT/ERDA-94041-004, August 1994, 25 pp. With H. M. Coward, J. A. Mulholland, and M. G. Robinson.
18. *Health Risk Assessment for the Savannah River Site Consolidated Incineration Facility, Part 1: Radionuclides Emissions*, Technical Report Prepared for Westinghouse Savannah River Company under ERDA Task Order 94-041, GT/ERDA-94041-005, Rev. 1, June 21, 1995, 153 pp. With T. M. Evans, H. M. Coward, J. A. Mulholland, M. G. Robinson, S. Pederson, Salim-Ur-Rehman and C. Baker.

19. *CIF Health Risk Assessment Work Plan for the Savannah River Site Consolidated Incinerator Facility*, Technical Report Prepared for Westinghouse Savannah River Company under ERDA Task Order 94-041, GT/ERDA-94041-006, March 30, 1995. With T. M. Evans and U. A. Burge.
20. *Health Risk Assessment for the Savannah River Site Consolidated Incineration Facility, Part 2: Chemical Emissions*, Technical Report Prepared for Westinghouse Savannah River Company under ERDA Task Order 94-041, GT/ERDA-94041-007, Rev. 1, June 28, 1995, 122 pp. With T. M. Evans, J. A. Mulholland, M. G. Robinson, S. Pederson, Salim-Ur-Rehman and C. Baker.
21. *Radioactive Waste Disposal Characteristics of Candidate Tokamak Demonstration Reactors*, Fusion Research Center and Nuclear Engineering Program, Georgia Institute of Technology, GTFR 119, August, 1995. With E. A. Hoffman and W. M. Stacey.

ADMINISTRATIVE ACTIVITY

National Technological University

Member, Health Physics Curriculum Committee 1994 - present

University of Texas at Austin

College:

| | |
|---|-------------|
| Nuclear Reactor Committee | 1979 - 1989 |
| Cooperative Engineering Education Committee | 1989 - 1992 |
| Graduate Student Recruiting Committee | 1990 - 1992 |

Department:

| | |
|---|-------------------------------------|
| Graduate Advisor Evaluation Committee | 1980 |
| Graduate Fellowship Selection Committee | 1981-1984, 1986 - 1987, 1989 - 1992 |
| Minority Liaison - Mechanical Engineering Department | 1981 - 1984 |
| Organization and Administration Committee for Mechanical Engineering Department Five-Year Planning Document | 1984 |
| Ad Hoc Committee on Ph.D. Admission Guidelines | 1984 |
| Computer Resource and Planning Committee | 1985 |
| Mechanical Engineering Computational Laboratory | 1987 |
| Committee/Mechanical Engineering Computer Committee | |
| Nuclear Program Long-Term Planning Committee | 1988 |
| Print Shop Procedures Committee | 1990 |
| Graduate Student Recruiting Committee | 1990 - 1992 |

Student:

| | |
|---|-------------|
| Advisor, Nuclear Block Option | 1979 - 1992 |
| Undergraduate Advising | 1979 - 1992 |
| Freshman Advising | 1980 - 1982 |
| Graduate Student Recruiting, Nuclear Engineering Area | 1981 - 1992 |
| Faculty Advisor, Student Engineering Council | 1982 - 1984 |
| Evaluation of ME 319 transfer credits | 1982 - 1987 |
| Department Coop Engineering Education Advisor | 1989 - 1992 |
| Faculty Advisor, Agape Force Ministries | 1982 - 1985 |
| Faculty Advisor, Student Chapter - American Nuclear Society | 1983 - 1992 |
| Faculty Advisor, Chi Alpha Christian Fellowship | 1983 - 1987 |
| Faculty Advisor, Alpha Omega Ministries | 1984 - 1986 |
| Faculty Advisor, Chinese for Christ | 1985 |

Georgia Institute of Technology

School:

| | |
|--|----------------|
| Member, Woodruff School Graduate Committee | 1993 - 1995 |
| Chair, Health Physics/Radiological Engineering Research Group | 1993 - 1996 |
| Chair, Nuclear Engineering, Radiological Engineering and Health Physics Research Group | 1996 - present |
| Chair, Nuclear Engineering/Health Physics Recruiting Committee | 1994 - present |
| Member, Woodruff School Honors and Awards Committee | 1994 - 1995 |
| Chair, Woodruff School Graduate Committee Subcommittee on Nonresident Students | 1994 - 1995 |
| Faculty Advisor, Georgia Tech Student Branch of the Health Physics Society | 1993 - present |
| Member, Woodruff School Computer Committee | 1995 - present |
| Member, Woodruff School Faculty Recruiting Committee | 1996 - present |
| Member, Woodruff School Undergraduate Curriculum Committee | 1996 - present |

Institute

| | |
|----------------------------|-------------|
| Member, Graduate Committee | 1996 - 1997 |
|----------------------------|-------------|

PUBLIC SERVICE

State and Local:

| | |
|--|---------------------------------------|
| <i>Oral Presentation</i> on Nuclear Power—Greater South Austin Kiwanis Club | 1979 |
| <i>Oral Presentation</i> on Nuclear Power—Sertoma Club of Austin | 1979 |
| <i>Discussion Moderator</i> of film "War Games", UT Ideas and Interactions Committee's <i>Ethics of the 80's Symposium</i> | 1979 |
| <i>Oral Presentation</i> on "Uranium Mining, Milling and Fuel Fabrication", Summer Workshop for Energy Education Teachers in Texas | 1979 - 1988 |
| <i>Participant</i> in Nuclear Power Discussion, NSF Summer Biology Program for High School Students at UT, Evening Bull Session | 1980 |
| <i>Oral Presentation</i> on Nuclear Power, Williamson County Amateur Radio Club | 1980 - 1981 |
| <i>Oral Presentation</i> on Nuclear Power, Oak Hill Elementary School, 5th Grade | 1980 - 1981 |
| <i>Oral Presentation</i> on Nuclear Power, Oak Hill Elementary School, 5th Grade | 1981 - 1982 |
| <i>Oral Presentation</i> on Nuclear Power, Linder Elementary School, 3rd Grade | 1981 - 1982 |
| <i>Energy and Environment Simulation Presentation</i> , Corpus Christi Science Teacher's Workshop | 1981 - 1982 |
| <i>Oral Presentation</i> on Nuclear Power, Linder Elementary School, 3rd Grade | 1982 - 1983 |
| <i>Panel Discussion</i> on Nuclear Weapons, Northwest Hills Methodist Church | 1984 |
| <i>Member</i> , Board of Trustees, Glad Tidings Assembly of God Church, Inc. Secretary - 1983; Vice President - 1984, 1991 | 1980 - 1981, 1982 - 1985, 1989 - 1992 |
| <i>Guest</i> on <i>Straight Talk</i> , KIXL Radio Talk Show | 1985 |
| <i>Speaker</i> , Graduation Banquet, Church of Glad Tidings | 1986 |
| <i>Speaker</i> , Breakfast Meeting, Full Gospel Businessmen's Association | 1988 |

| | |
|--|----------------|
| <i>Head Coach, AA League Orioles, Northwest Little League.</i> | 1989 |
| <i>Oral Presentation on Nuclear Energy, Science and Technology Week, Round Rock High School, Round Rock, TX.</i> | 1989 |
| <i>Oral Presentation on Radiation, High School Science Teacher's Workshop on Nuclear Energy, Austin, TX Independent School District</i> | 1991 |
| <i>Oral Presentation on Radiation: What Is It?, High School Science Teacher's Workshop on Nuclear Energy, Round Rock, TX Independent School District</i> | 1992 |
| <i>Oral Presentation on Nuclear Energy, North Cobb High School, Kennesaw, GA</i> | 1993 |
| <i>Member, Board of Deacons, Calvary Assembly of God Church, Dunwoody, GA</i> | 1995 - present |

National and International:

Summer Supervision -Graduate students from Universidad Autonoma de Nuevo Leon 1979 - 1981



**Georgia Institute
of Technology**

July 8, 1997

Office of the President

IN CONFIDENCE

Mr. Rodney Ice, Ph.D.
Radiation Safety Officer
Nuclear Research Center
Georgia Institute of Technology
Atlanta, GA 30332-0425

Dear Rodney:

Georgia Tech has made the decision to permanently cease the operation of our nuclear research reactor and intends to apply for a Possession-Only-License(P-O-L) and immediately begin to prepare a Site Characterization Plan and develop a Decommissioning Plan and cost estimate.

During this process, it will be necessary to have a Technical Safety Review Committee to provide technical and management oversight of the decommissioning activities of the GTRR. Specifically, the Committee will:

- ♦ Review and approve changes to existing GTRR Technical Specifications. Changes to the technical specifications will be prepared by NES, Inc. in conjunction with GTRR's technical staff. This document will be submitted to the NRC.
- ♦ Review and approval of a Radiological and Hazardous Site Characterization Plan. This document will be prepared by NES, Inc.
- ♦ Review and approval of the end-use of the facility and end-point of the decommissioning process. This activity will consist primarily of a Georgia Tech initiative and assisted by NES, Inc. This document will be the basis of the GTRR's Decommissioning Plan and cost estimate.
- ♦ Review and approval of the Decommissioning Plan of the Decommissioning Cost Estimate. These documents will be submitted to the NRC.
- ♦ Review and approval of all communications with the NRC.

I hope that you will serve as a member of the Technical Safety Committee and I appreciate your personal support of this important project.

Sincerely,

Wayne Clough
President

enclosures: Committee Membership

Georgia Institute of Technology
Atlanta, Georgia 30332-0325 U.S.A.
PHONE 404-894-5051
FAX 404-894-1277

A Unit of the University System of Georgia

An Equal Education and Employment Opportunity Institution

CURRICULUM VITAE
February 1997

I. PERSONAL RECORD

1. NAME: Rodney Dean Ice
2. SEX: Male
3. BORN: April 24, 1937, Fort Lewis, Washington
4. MARRIED: March 21, 1958, Olympia, Washington
5. WIFE'S MAIDEN NAME: Joan Elizabeth McCullough
6. CHILDREN: Randal Dean Ice, April 6, 1959
Rex Daryl Ice, February 19, 1961
Ronald Dale Ice, April 30, 1963
7. EDUCATION:
 - a. William Winlock Miller High School, Olympia, WA, 1955
 - b. University of Washington, Seattle, WA, B.S., Pharmacy, 1959
 - c. Purdue University, West Lafayette, IN, M.S., 1965
 - d. Purdue University, West Lafayette, IN, Ph.D., 1967
8. GRADUATE TRAINING
 - a. 1965, M.S.
Major: Radiological Health
Minor: Public Health (Sanitary Engineering)
Minor: Analytical Chemistry
 - b. 1967, Ph.D.
Major: Radiological Health
Minor: Pharmaceuticals
9. ACADEMIC APPOINTMENTS AND/OR EXPERIENCE
 - a. 1992-present Principal Research Scientist, Manager of
Office of Radiation Safety, Georgia
Institute of Technology, Atlanta, GA.
 - b. 1992-present Adjunct Professor, Health Physics
Program, Georgia Institute of
Technology, Atlanta, GA.

- c. 1985-1992 Vice President and Director of Research, Eagle-Picher Industries Inc., (NYSE), Miami, OK (Self-Supporting Research Facility, \$10M budget, 55 person staff).
- d. 1983-1985 Vice President of Corporate Development, Benedict Nuclear Pharmaceuticals, Golden, CO. (Responsible for Research Department, Professional Affairs Department and University Liaison Office.)
- e. 1976-1983 Dean and Professor of Pharmacy, College of Pharmacy, Health Sciences Center, University of Oklahoma, Oklahoma City, OK. (Responsible for \$2M budget, 25 full-time faculty, 40 adjunct faculty and 400 students.)
- f. 1976-1983 Associate Professor, Department of Radiology, School of Medicine, University of Oklahoma, Oklahoma City, OK.
- g. May-September 1982 Visiting Scholar, University of Michigan, Ann Arbor, MI.
- h. 1976 Professor of Pharmacy, College of Pharmacy, University of Michigan, Ann Arbor, MI. (Taught Health Physics and Radioisotopes in Medicine.)
- i. 1973-1976 Associate Professor of Internal Medicine, University of Michigan, Ann Arbor, MI.
- j. 1971-1973 Assistant Professor of Internal Medicine, University of Michigan, Ann Arbor, MI.
- k. 1971-1976 Associate Professor of Pharmacy, College of Pharmacy, University of Michigan, Ann Arbor, MI.
- l. 1971-1976 Director, Radiopharmaceutical Services, University Hospital, University of Michigan, Ann Arbor, MI.
- m. 1970-1971 Associate Professor of Radiochemistry, Temple University, Philadelphia, PA. (Taught graduate courses in Radioisotope Methodology, Health Physics and Nuclear Pharmacy.)

- n. 1967-1970 Assistant Professor of Radiochemistry, Temple University, Philadelphia, PA.
- o. 1967-1970 Radiation Safety Officer, Temple University, Philadelphia, PA.
- p. July 2-6, 1980 Health Physics Society Summer School, Philadelphia, PA.
- q. May 28-June 1, 1984 Health Physics Society Summer School, New Orleans, LA.
- r. May 19-23, 1969 "Non-Ionizing Radiation," U.S. H.P.S., Bethesda, MD.
- s. 1964-1967 Radiological Health Fellow, School of Pharmacy and Pharmacal Sciences, Purdue University, West Lafayette, IN.
- t. 1959-1965 Owned and operated Rod's Tanglewilde Drugs, 6515 Martin Way, Olympia, WA.
- u. 1955-1959 Pharmacist and Intern, Freed's Pharmacies, Seattle, WA; Gillette and Guffey Drugs, Olympia, WA.

10. CONSULTING POSITIONS

- a. National Association Boards of Pharmacy, 1974-1986
- b. University of Tennessee, Memphis, TN, 1980
- c. Department of Health, City of Philadelphia, PA, 1968-1976
- d. Veterans Administration Hospital, Ann Arbor, MI, 1972-1976
- e. Veterans Administration Hospital, Allen Park, MI, 1976
- f. Searle Laboratories, Chicago, IL, 1975
- g. Smith, Kline and French, Philadelphia, PA, 1970
- h. Philadelphia Technical Institute, Philadelphia, PA, 1968-1969

11. CERTIFICATION AND LICENSURE

- a. Certified Health Physicist, American Board of Health Physics, 1972 (Recertified, 1980, 1985, 1990, 1995)

- b. Washington State Board of Pharmacy, 1959-present
- c. California State Board of Pharmacy, 1959-present
- d. Michigan State Board of Pharmacy, 1972-1988
- e. Oklahoma State Board of Pharmacy, 1977-present

12. MILITARY SERVICE

- a. Colonel, USAR, Medical Service Corps, 1961-present
- b. Commissioned Officer, Medical Service Corps, July, 1958
- c. Graduate, Washington Military Academy (Infantry, Officers Candidate School), 1957-1958
- d. Washington State National Guard, 1953-1963

13. HONORS

- a. Rho Chi
- b. Sigma Xi
- c. Dean's List
- d. International Scholars Directory
- e. Who's Who in the Midwest, 15th and 16th Edition
- f. American Men and Women of Science, 13th, 14th, 15th and 16th Edition
- g. Dictionary of International Biography, Volume 14 and 18
- h. Who's Who in Health Care, 1st and 2nd Edition
- i. Community Leaders and Noteworthy Americans, American Biography Institute
- j. Who's Who in the World, Volume 6
- k. University of Oklahoma Alumni, Outstanding Pharmacist Award, 1979
- l. Personalities of the South, 10th and 11th Edition
- m. American Biography of the Medical Sciences, 1978
- n. Who's Who in the South and Southwest, 17th, 20th, 23rd, 24th and 25th Edition

- o. Directory of Nuclear Medicine, Butterworth, 1981
- p. Who's Who in America, 42nd, 43rd and 44th Edition
- q. American Pharmaceutical Association, Academy of Pharmacy Practice, Service Award, 1983
- r. Biographical Directory of Occupational and Safety Specialists, 1st Edition
- s. Purdue University "Old Master" Award, 1986
- t. Who's Who in Science and Engineering, 1st Edition
- u. Who's Who in American Education, 3rd Edition
- v. Ponca City, Oklahoma, Service Recognition Award, 1991
- w. Who's Who, Environmental Registry, 1992
- x. Oxford's Who's Who, 1992
- y. Men of Achievement, 15th Edition
- z. American Men and Women of Science, 1994
- aa. Who's Who in Science and Theology, 1994, 1996

14. MEMBERSHIPS IN PROFESSIONAL SOCIETIES

- a. 1991-present International Isotope Society
- b. 1955-present American Pharmaceutical Association
- c. 1967-present American Association for the Advance of Science
- d. 1965-present Health Physics Society
- e. 1970-present American Scientific Affiliation
- f. 1971-present Society of Nuclear Medicine
- g. 1968-1983 American Association of Colleges of Pharmacy
- h. 1976-1983 Oklahoma State Pharmaceutical Association
- i. 1973-1982 American Institute History of Pharmacy
- j. 1955-1976 Washington State Pharmaceutical

- | | | Association |
|----|-----------|---|
| k. | 1955-1974 | American Public Health Association |
| l. | 1968-1974 | Conference of Radiological Health |
| m. | 1967-1971 | Delaware Valley Radiation Protection Society |
| n. | 1959-1965 | Southwest Washington Pharmaceutical Association |
| o. | 1962-1963 | Puget Sound Pharmaceutical Association |

15. POSITIONS HELD IN ABOVE SOCIETIES

- a. American Association of Colleges of Pharmacy
 - 1.) Delegate, 1975, 1976, 1977, 1978
 - 2.) Academic Affairs Committee, 1976, 1977, 1978
- b. American Pharmaceutical Association
 - 1.) Chairman, Nuclear Pharmacy Section, Academy of Pharmacy Practice, 1977-1978
 - 2.) Nuclear Pharmacy Committee of Legislative Affairs, 1976
 - 3.) Nominating Committee, 1979-1980
 - 4.) Regulatory Affairs Committee, 1980-1981, 1983-1984
- c. Delaware Valley Radiation Protection Society, President Elect, 1969; President, 1970
- d. American Pharmaceutical Association
 - 1.) Meeting Delegate, Washington State, 1964
 - 2.) Meeting Delegate, Academy of Pharmacy Practice, 1978
 - 3.) Meeting Delegate, Oklahoma State, 1981
- e. Southwest Washington Pharmaceutical Association
 - 1.) Secretary, 1969-1961
 - 2.) President Elect, 1962

3.) President, 1963

16. COMMITTEE AND ADMINISTRATIVE SERVICE

a. National

- 1.) 1982-1983 Nuclear Pharmacy Committee, National Association of Boards of Pharmacy
- 2.) 1980-1990 Revision Committee, United States Pharmacopeia
- 3.) 1977-1984 Board of Pharmaceutical Specialties, Specialty Council of Nuclear Pharmacy
- 4.) 1968-1985 Representative of the American Pharmaceutical Association to the United States Standards Institute Committee, N-44, "Equipment and Materials for Medical Radiation Applications"
- 5.) 1976-1978 Trustee, Radiopharmaceutical Science Council, Society of Nuclear Medicine
- 6.) 1976-1979 Editorial Advisory Board, U.S. Pharmacist
- 7.) 1974-1977 Subcommittee of Nuclear Pharmacy, American Association of Colleges of Pharmacy
- 8.) 1976 Chairman, Subcommittee of Nuclear Pharmacy, American Association of Colleges of Pharmacy

b. State

- 1.) 1980-1981 Membership Committee, Oklahoma Pharmaceutical Association, State of Oklahoma
- 2.) 1975-1976 Chairman, Radiopharmaceutical Advisory Committee, Michigan Board of Pharmacy, Department of Licensing and Regulation, State of Michigan
- 3.) 1973-1976 Chairman, Governor's Radiation Advisory Committee, State of Michigan

c. Georgia Institute of Technology

- 1.) 1995-present Safety Advisory Committee

- d. University of Oklahoma
 - 1.) 1981-1982 HSC LRP and Affirmative Action
 - 2.) 1979-1982 OK Teaching Hospitals P&T Committee
 - 3.) 1976-1981 Radiation Safety Committee
 - 4.) 1976-1983 Dean's Council
 - 5.) 1976-1983 V.A. Administration Dean's Committee
- e. University of Michigan
 - 1.) 1975-1976 Chairman, Graduate Affairs Committee
 - 2.) 1973-1976 Educational Resources Committee
 - 3.) 1972-1976 Executive Committee, College of Pharmacy
 - 4.) 1972-1973 Faculty Senate
 - 5.) 1974-1975 Alumni Lecture Committee
 - 6.) 1972-1976 Graduate Research Support Committee
- f. Temple University
 - 1.) 1970-1971 Head, Bionucleonics Division
(Radiological Health, Nuclear Pharmacy,
Radiation Safety Office, 4 faculty, 7
staff)
 - 2.) April 18- Chairman, Workshop on
19, 1969 Thermoluminescent Dosimetry, Jefferson
Medical Center, Jefferson University,
Philadelphia, PA
 - 3.) 1967-1971 Radiation Protection Committee
 - a.) 1970-1971 Chairman, University Policy
Committee
 - b.) 1967-1971 Chairman, Health Sciences
 - 4.) 1969-1971 Human Use Committee
 - 5.) 1968-1971 School of Pharmacy
 - a.) 1969-1970 Chairman, Equipment Committee
 - b.) 1968-1970 Equipment Committee

- c.) 1968-1969 Admissions Committee
- d.) 1968-1969 Graduate Committee
- e.) 1968-1971 Student Activities Committee
- 6.) 1968-1971 Faculty Advisor, Phi Delta Chi Pharmacy Fraternity
- 7.) 1967-1970 Administered Radiation Safety Office (6 staff)
- g. Reviewer
 - 1.) The Journal of Nuclear Medicine
 - 2.) American Journal Hospital Pharmacy
 - 3.) Journal of Medicinal Chemistry
 - 4.) Encyclopedia of Chemical Technology
 - 5.) Health Physics Journal

17. COMMUNITY SERVICE

- a. 1991-present Board of Trustees, Bacone College, Muskogee, OK
- b. 1991 Technical Advisory Committee, City of Miami, OK
- c. 1989-present Member, Management Advisory Board, Center for Space Power, Texas A&M University, College Park, TX
- d. 1975 Executive Chairman for Billy Graham Association, Washtenaw Co., "The Hiding Place" film
- e. 1974 Executive Chairman for Billy Graham Association, Washtenaw Co., "Time to Run" film
- f. 1971-present Board of Trustees, Philadelphia College of Bible, Philadelphia, PA
- g. Church Membership
 - 1.) 1993-Present First Baptist Church, Atlanta, GA (adult Sunday school teacher, choir)

- 2.) 1987-1992 First Baptist Church, Miami, OK
(adult Sunday school teacher, choir)
- 3.) 1977-1981 Metropolitan Baptist Church, Oklahoma City, OK
- 4.) 1971-1977 Packard Road Baptist Church, Ann Arbor, MI (adult Sunday school teacher, deacon, choir)
- 5.) 1968-1971 Wharton Baptist Church, Philadelphia, PA (senior high Sunday school teacher, deacon, choir)
- 6.) 1964-1968 First Baptist Church, Lafayette, IN (substitute Sunday school teacher)
- 7.) 1953-1964 First Baptist Church, Olympia, WA (Sunday school teacher, Sunday school superintendent, choir, junior high youth leader)
- h. 1970-present Gideons International (President, Ann Arbor Camp-1973), Ann Arbor, MI
- i. 1961-1964 Christian Business Men's Club, Olympia, WA

II. BIBLIOGRAPHY

A. Publications

1. Ice, R.D., Master's Thesis: "A Study of the Retention, Excretion, and Distribution of 2,3,5-Triiodobenzoic Acid and Its Metabolites in the Rat," Purdue University, Lafayette, IN, August, 1965.
2. Ice, R.D., Breckinridge, C.E., Jr., and Christian, J.E.: "Retention, Excretion, and Distribution of 2,3,5-Triiodobenzoic Acid and Its Metabolites in the Rat," Journal of Pharmacy Science, 55: 497-500, 1966.
3. Ice, R.D., Doctoral Dissertation: "The Metabolic Rate of Orally Administered 2,3,5-Triiodobenzoic Acid and Its Metabolites in Lactating Animals," Purdue University, Lafayette, IN, June, 1967.
4. Ice, R.D., Christian, J.E., and Plumlee, M.P.: "Metabolic Rate of Orally Administered 2,3,5-Triiodobenzoic Acid in Lactating Animals," Journal of Pharmacy Science, 57: 399-404, 1968.

5. Dugan, M.A., and Ice, R.D.: "Beta Emitter Identification by Quench Analysis, Organic Scintillators and Liquid Scintillation Counting," Horrocks, D.L. and Peng, C.T., Ed.: 1055-1062, Academic Press, 1971.
6. Ice, R.D.: "Establishment of a University Radiation Safety Office," Health Physics, 20: 444-446, 1971.
7. Ice, R.D., and Dugan, M.A.: "Beta Radiopharmaceutical Identification by Quench Analysis," The Journal of Nuclear Medicine, 12: 552-554, 1971.
8. Ice, R.D., Updegrave, W.J., and Bogucki, E.I.: "Influence of Dental Radiographic Cones on Radiation Exposure," J.A.D.A., 83: 1297-1302, 1971.
9. Bercz, C.V., and Ice, R.D.: "Synthesis of 1-Carbethoxy-4-Cyano-4-Phenylpiperidine," J. Phar. Sci., 61: 1316-1317, 1972.
10. Lieberman, J. E., Ice, R.D., Green, M., and McGratten, R.: "Summary of Environmental Monitoring at Philadelphia, 1958-1971," Radiological Health Data and Reports, 14: 333-350, 1973.
11. Kirschner, A.S., Ice, R.D., and Beierwaltes, W.H.: "Radiation Dosimetry of I-19-Iodocholesterol," The Journal of Nuclear Medicine, 14: 713-717, 1973.
12. Kelly, W.N., and Ice, R.D.: "Pharmaceutical Quality of Technetium-99m Sulfur Colloid," American Journal of Hospital Pharmacy, 30: 817-820, 1973.
13. Ice, R.D., and Hetzel, K.R.: "Radiation Protection in a Nuclear Pharmacy," Proceedings of the Third International Congress of the International Radiation Protection Association, Sept. 9-14, 1973, Washington, D.C., 1197-1202.
14. Ice, R.D., and Hetzel, K.R.: "Radiation Protection in a Nuclear Pharmacy," Conf. 730907, USAEC, Oak Ridge, TN.
15. Hotte, C., and Ice, R.D.: "Thermal and Radiolytic Decomposition of I-19-Iodocholesterol," The Journal of Nuclear Medicine, 15: 38-41, January, 1974.
16. Clayton, B.D., Ice, R.D., and Beierwaltes, W.H.: "Preparation, Quality Control and Clinical Acceptance of Labeled Macrotec," Radiology, 116: 223-225, July, 1975.

17. Anderson, B.G., Beierwaltes, W.H., Harrison, T.S., Ansari, A.N., Buswink, A.A., and Ice, R.D.: "Labeled Dopamine Concentration in Pheochromocytomas," The Journal of Nuclear Medicine, 14: 781-784, November, 1973.
18. Ice, R.D., Shaw, S.M., Born, G.S., and George, R.E.: "Nuclear Pharmacy Education," American Journal of Pharmacy Education, 38: 420-425, August, 1974.
19. Sturman, M.F., Beierwaltes, W.H., Prakash, S., Ryo, U.Y., Ice, R.D., and Gitomer, W.: "Uptake of Radiolabeled Testosterone, 5-Dihydrotestosterone, Estradiol, and Pregnenolone by Canine Prostate," The Journal of Nuclear Medicine, 15: 94-97, February, 1974.
20. Beierwaltes, W.H., Sturman, M.F., Ryo, U.Y., and Ice, R.D.: "Imaging Functional Nodules of the Adrenal Glands with I-19-Iodocholesterol," The Journal of Nuclear Medicine, 15: 246-251, April, 1974.
21. Ryo, U.Y., Beierwaltes, W.H., and Ice, R.D.: "Enhancement of Uptake with Estradiol Treatment of a Radiolabeled Irreversible Competitive Enzyme Inhibitor in the Adrenal Cortices and Ovaries of Rats with Endocrine Autonomous Breast Carcinoma," The Journal of Nuclear Medicine, 15: 187-189, March, 1974.
22. Ryo, U.Y., Beierwaltes, W.H., Freehan, P., and Ice, R.D.: "Distribution of 14-C and 3-H-Streptozotocin in Dogs and Toadfish," The Journal of Nuclear Medicine, 15: 572-576, July, 1974.
23. Sturman, M.F., Moses, D.C., Beierwaltes, W.H., Harrison, T.S., Ice, R.D., and Dorr, R.P.: "Radiocholesterol Adrenal Images for the Localization of Pheochromocytoma," Surgery, Gynecology, and Obstetrics, 138: 177-180, February, 1974.
24. MacAuley, R.J., Ice, R.D., and Curtis, E.G.: "The Limulus Test for In Vitro Pyrogen Detection," American Journal Hospital Pharmacy, 31: 688-691, July, 1974.
25. Ryo, U.Y., Shaw, M.J., Beierwaltes, W.H., and Ice, R.D.: "Distribution of 14-C-Diphenylhydantoin in Pancreas Islet Cell and Other Tissue of Toadfish," The Journal of Nuclear Medicine, 15: 685-687, August, 1974.
26. Ice, R.D., and Hetzel, K.R.: "Nuclear Pharmacy Health Physics," Selected Papers on Nuclear Pharmacy, American Pharmaceutical Association, Washington, DC: 39-44, January, 1976.

27. Hetzel, K.R., and Ice, R.D.: "Clinical Nuclear Pharmacy," Selected Papers on Nuclear Pharmacy, American Pharmaceutical Association, Washington, DC: 39-44, January, 1976.
28. Hetzel, K.R., and Ice, R.D.: "Clinical Nuclear Pharmacy," Selected Papers of Nuclear Pharmacy, American Pharmaceutical Association, Washington, DC: 31-38, January, 1976.
29. Shen, V., Hetzel, K.R., and Ice, R.D.: "Radiochemical Purity of Radiopharmaceuticals Using Gelman Seprachrome (ITLC) Chromatography," Gelman Technical Bulletin, No. 32, Gelman Instrument Co., Ann Arbor, MI, October, 1974.
30. Moses, D.C., Schteingart, D.E., Sturman, M.F., Beierwaltes, W.H., and Ice, R.D.: "Efficacy of Radiocholesterol Imaging on the Adrenal Glands in Cushing's Syndrome," Surgery, Gynecology, and Obstetrics, 139: 201-205, August, 1974.
31. Sturman, M.F., Beierwaltes, W.H., Ice, R.D., and Prakash, S.: "Uptake of Radiolabeled Estradiol by the Canine Adrenal," The Journal of Nuclear Medicine, 16: 77-79, January, 1975.
32. Ryo, U.Y., Ice, R.D., Jones, J.D., and Beierwaltes, W.H.: "Relative Tissue Distribution of Radioactivity in Rats with Endocrine 'Autonomous' Breast Carcinomas after 3-H-, 99m-Tc-, and 64-Cu-Bleomycin," The Journal of Nuclear Medicine, 16: 127-131, February, 1975.
33. Lamson, M.L., Kirschner, A.S., Hotte, C.E., Lipsitz, E.L., and Ice, R.D.: "Generator Produced 99m-TcO₄: Carrier Free?," The Journal of Nuclear Medicine, 16: 639-641, July, 1975.
34. Blau, M., Kirschner, A.S., Ice, R.D., and Beierwaltes, W.H.: "Radiation Dosimetry of 131-I-19-Iodocholesterol: The Pitfalls of Using Tissue Concentration Data," The Journal of Nuclear Medicine, 16: 247-250, March, 1975.
35. Anderson, B.G., Beierwaltes, W.H., Nishiyama, R.H., and Ice, R.D.: "Effect of Large Doses of 131-I-19-Iodocholesterol on Metapyralone Induced Adrenal Cortical Hyperlasia in Dogs," The Journal of Nuclear Medicine, 16: 928-932, October, 1975.
36. Blachandran, S., Beierwaltes, W.H., Ice, R.D., Fajans, S.S., Ryo, U.Y., Redmond, M.J., Hetzel, K.R., Mosely,

- S.T., and Feldstein, B.: "Tissue Distribution of 14-C-125-I- and 131-I-Diphenylhydantoin in the Toadfish, Rat and Humans with Insulinomas," The Journal of Nuclear Medicine, 16: 775-779, August, 1975.
37. Basmadjian, G.P., Hetzel, K.R., and Ice, R.D.: "New Methods for Introducing 75-Se into Radiopharmaceuticals," Int. J. App. Rad. and Isotopes, 26: 695-687, November, 1975.
 38. Ice, R.D., Wieland, D.M., Beierwaltes, W.H., and Lawton, R.G.: "Concentration of Dopamine Analogs in the Adrenal Medulla," The Journal of Nuclear Medicine, 16: 1147-1151, December, 1975.
 39. Porter, W.C., Ice, R.D., and Hetzel, K.R.: "Establishment of Nuclear Pharmacy," American Journal Hospital Pharmacy, 32: 1023-1027, October, 1975.
 40. Sarkar, S.D., Beierwaltes, W.H., Ice, R.D., Basmadjian, G.P., Hetzel, K.R., Kennedy, W.P., and Mason, M.M.: "A New and Superior Adrenal Scanning Agent: NP-59," The Journal of Nuclear Medicine, 16: 1038-1042, November, 1975.
 41. Hetzel, K.R., and Ice, R.D.: "Pitfalls in Radiometric Sterility Assay," The Journal of Nuclear Medicine, 16: 798, August, 1975.
 42. Basmadjian, G.P., Hetzel, K.R., Ice, R.D., and Beierwaltes, W.H.: "Synthesis of a New Adrenal Cortex Scanning Agent, 6B-I-131-Iodomethyl-19-Norcholest-5(10)-en-3B-ol (NP-59)," J. Labeled Compounds, 11: 427-434, No. 3, 1975.
 43. Sarkar, S.D., Ice, R.D., Beierwaltes, W.H., Gill, S.P., Balachandran, S., and Basmadjian, G.P.: "75-Se-19-Selenocholesterol - A New Adrenal Scanning Agent with High Concentration in the Adrenal Medulla," The Journal of Nuclear Medicine, 17: 212-217, March, 1976.
 44. Seabold, J.E., Cohen, E.L., Beierwaltes, W.H., Hinerman, D.L., Nishiyama, R., Bookstein, J.J., Ice, R.D., and Balachandran, S.: "Adrenal Imaging with 131-I-19-Iodocholesterol in the Diagnostic Evaluation of Patients with Aldosteronism," Journal of Clinical Endocrinology and Metabolism, 42: 41-51, January, 1976.
 45. Beierwaltes, W.H., Ice, R.D., Shaw, M.J., and Ryo, U.Y.: "Myocardial Uptake of Labeled Oleic and Linoleic Acids," The Journal of Nuclear Medicine, 16: 842-845, September, 1975.

46. Lamson, M., Hotte, C., and Ice, R.D.: "Practical Generator Kinetics," J. Med. Techn., 5: 21-27, March, 1976.
47. Ice, R.D., Kircos, L.T., Coffey, J.L., Watson, E.E., Beierwaltes, W.H., and Sarkar, S.D.: "Radiation Dosimetry of 6-131-I-Iodomethyl-19-Norcholesterol, NP-59," Radiopharmaceutical Dosimetry Symposium Proceedings, HEW Publication (FDA) 76-8044, 246-255, June, 1976.
48. Kirschner, A.S., and Ice, R.D.: "The Theoretical Effect of Radiopharmaceutical Specific Activity on Tissue Localization and Absorbed Radiation Dose," Radiopharmaceutical Dosimetry Symposium Proceedings, HEW Publication (FDA), 76-8044, 140-151, June, 1976.
49. Ice, R.D., and Hetzel, K.R.: "Hospital Radiopharmaceutical Quality Assurance," Applied Radiology/NM, 213-217, November-December, 1976.
50. Behm, H.L., and Ice, R.D.: "An Introduction to Nuclear Pharmacy," U.S. Pharmacist, 1: 29-33, October 1976.
51. Sarkar, S.D., Cohen, E.L., Beierwaltes, W.H., Ice, R.D., Cooper, R., and Gold, E.N.: "A New and Superior Adrenal Imaging Agent, NP-59: Evaluation in Humans," J. Clinical Endocrinology and Metabolism, 45: 353-362, August, 1977.
52. Beierwaltes, W.H., Wieland, D.M., Ice, R.D., Seabold, J.E., Sarkar, S.D., Gill, S.P., and Mosley, S.T.: "Localization of Radiolabeled Enzyme Inhibitors in the Adrenal Gland," The Journal of Nuclear Medicine, 17: 998-1002, November, 1976.
53. Hotte, C.E., and Ice, R.D.: "Use of a Revised MIRD Equation for Dosimetric Calculations in Physical Systems," Health Physics, 32: 442-443, May, 1977.
54. Hotte, C.E., Ice, R.D., and Flynn, G.L.: "Radiolysis of 131-I-O-Iodophippurate: A Kinetic Study," J. Labeled Compounds and Radiopharmaceuticals, 17: 715-725, 1980.
55. Behm, H.L., and Ice, R.D.: "Radiological Physics of Nuclear Pharmacy," U.S. Pharmacist, 2: 50-57, January, 1977.
56. Behm, H.L., and Ice, R.D.: "Nuclear Pharmacy Radiological Health," U.S. Pharmacist, 2: 42-47, March, 1977.

57. Behm, H.L., and Ice, R.D.: "Organ Imaging Radiopharmaceuticals," U.S. Pharmacist, 2: 64-72, May, 1977.
58. Behm, H.L., and Ice, R.D.: "In Vitro Radiopharmaceuticals," U.S. Pharmacist, 2: 64-74, August, 1977.
59. Behm, H.L., and Ice, R.D.: "Radiopharmaceutical Function Studies," U.S. Pharmacist, 2: 70-80, October, 1977.
60. Vivian, A., Ice, R.D., Shen, V., and Hetzel, K.R.: "Procedure Manual, Radiochemical Purity of Radiopharmaceuticals Using Gelman Seprachrom Chromatography," Tech. Bulletin 32, Gelman Instrument Company, June, 1977.
61. Basmadjian, G.P., Ice, R.D., Magarian, R.A., Parker, G.R., Mills, S.L., and Kirschner, A.S.: "Design and Development of Te-123m Radiopharmaceuticals," Society of Nuclear Medicine, Radiopharmaceuticals II, 93-99, November, 1979.
62. Gilliland, D.L., Basmadjian, G.P., Kirschner, A.S., Leonard, J.C., and Ice, R.D.: "Development of Lymphoscintigraphy Agent: Tc-Sn-PO₄," Society of Nuclear Medicine, Radiopharmaceuticals, II: 321-330, November, 1979.
63. Hotte, C.E., and Ice, R.D.: "The In Vitro Stability of ¹³¹I-O-Iodohippurate," The Journal of Nuclear Medicine, 20: 441-447, May, 1979.
64. Basmadjian, G.P., Parker, G.R., Magarian, R.A., Ice, R.D., Mills, S.L., and Kirschner, A.S.: "Synthesis of Te-123m Nucleophiles: Potential Use in the Synthesis of New Te-123m Radiopharmaceuticals," International Journal of Applied Radiation and Isotopes, 31: 517-520, 1980.
65. Mills, S.L., Basmadjian, G.P., Parker, G.R., and Ice, R.D.: "Synthesis of Te-123m Labeled Fatty Acids," J. of Labelled Compounds and Radiopharmaceuticals, 18: 721-730, May, 1981.
66. Hinkle, G.H., Basmadjian, G.P., Kirschner, A.S., and Ice, R.D.: "Evaluation of a Kit Preparation of Radioiodinated O-Iodohippuran," J. Pharm. Sci. 70: 312-316, March, 1981.
67. Hinkle, G.H., Basmadjian, G.P., Kirschner, A.S., and Ice, R.D.: "A Radiopharmaceutical Kit Preparation of

- 123-I-Iodohippuran," Nuclear Medicine Communications 1: 302-306, 1981.
68. Mills, S.L., Basmadjian, G.P., and Ice, R.D.: "Radiopharmaceuticals Used in Myocardial Imaging," J. Pharm. Sci., 70: 1-12, January 1981.
 69. Gilliland, D.L., Basmadjian, G.P., Marchand, A.P., Hinkle, G.H., Earlywine, A., and Ice, R.D.: "Iodine Labeled Radiopharmaceuticals from Arylthallium Bis-(Trifluoroacetate) Intermediates," J. Radioanalytical Chem., 65: 107-113, No. 1-2, 1981.
 70. Ahluwalia, B., Allen, E.W., Basmadjian, G.P., and Ice, R.D.: "The Role of Nuclear Pharmacy in Reducing Radiation Exposure," Health Physics, 40: 728-729, May, 1981.
 71. Donuhue, D.M., Leonard, J.C., Basmadjian, G.P., Nitschke, R.M., Hinkle, G.H., Ice, R.D., Wilson, D.A., and Tunnell, W.P.: "Thymic-Gallium-67 Localization in Pediatric Patients on Chemotherapy," J. Nucl. Med., 22: 1043-1048, 1981.
 72. Ice, R.D., and Basmadjian, G.: "Nuclear Pharmacy Ph.D. Programs," American Pharmacy, NS21: 569-597, October, 1981.
 73. Waschek, J., Hinkle, G.H., Basmadjian, G.P., Allen, E.W., and Ice, R.D.: "Effect of Cardiac Drugs on Imaging Studies with Thallous Chloride Tl-201," Am. J. Hosp. Pharm. 38: 1726-8, November, 1981.
 74. Basmadjian, G.P., Mills, S.L., and Ice, R.D.: "Synthesis Biological Distribution and Radiation Dosimetry of Te-123m Analogs of Hexadecenoic Acid," Nucl. Med. Comm., 3: 150-154, June, 1982.
 75. Basmadjian, G.P., Mills, S.L., and Ice, R.D.: "Synthesis Biological Distribution and Radiation Dosimetry of Te-123m Analogs of Hexadecenoic Acid," Proc. for the 3rd World Congress of Nuclear Medicine and Biology, September, 1982.
 76. Sadek, S.A., Basmadjian, G.P., and Ice, R.D.: "Labeling Radiopharmaceutical with Se-75: Using Se-75 Selenios Acid," Nucl. Med. Comm. 3: 247-250, August, 1982.
 77. Hinkle, G.H., Basmadjian, G.P., Peek, C., Barker, K.K., and Ice, R.D.: "Effects of Current Drug Therapy on Technetium Tc-99m Glucoptate Biodistribution," Am. J.

Hosp. Pharm. 39d: 1930-1933, November, 1982.

78. Basmdjian, G.P., Johnston, J., Barker, K., and Ice, R.D.: "Trends in Radiopharmaceutical Dispensing in a Regional Nuclear Pharmacy," Am. J. Hosp. Pharm., 39: 1933-1936, November 1982
79. Basmdjian, G.P., Johnston, J., Barker, K., and Ice, R.D.: "Trends in Radiopharmaceutical Dispensing in Regional Nuclear Pharmacy," Proceedings of the 3rd World Congress of Nuclear Medicine and Biology, Pergamon Press, 4: 3240, 3252, September, 1982.
80. James, M.R., Basmdjian, G.P., Leonard, J.C., and Ice, R.D.: "Desferoxamine Mesylate: Its Use in Reducing Radiation Burden in Pediatric Patients Injected with Gallium-67 Citrate," Proceedings of the 3rd World Congress of Nuclear Medicine and Biology, Pergamon Press, 1: 991-993, September, 1982.
81. Grussing, P.G., Allen, D.R., Callahan, R.J., Cooper, J.F., Ice, R.D., Kalman, S.H., Penna, R.P., Shaw, S.M., and Solomon, A.D.: "Development of Pharmacy's First Specialty Certification Examination: Nuclear Pharmacy," Am. J. Pharm. Ed., 47: 11-18, Spring, 1983.
82. Fung, T.J., Basmdjian, G.P., and Ice, R.D.: "Nuclear Pharmacy Management Information Retrieval System," Am. J. Hosp. Pharm., 40: 818-821, May, 1983.
83. Sadek, S.A., Basmdjian, G.P., Rieger, J.A., Hsu, P.M., and Ice, R.D.: "New Se-75 Labelled Radiopharmaceuticals 2. Selenium Derivatives of Aralyklamines," Int. J. Appl. Rad. Isot., 35: 35-39, January, 1984.
84. Chan, S.M., Basmdjian, G.P., Marten, D.R., Sadek, S.A., Magarian, R.A., Grunder, J.R., and Ice, R.D.: "Synthesis and Biodistribution of Radioiodinated-5-Iodonitrocinoline," J. Labeled Compd. Radiopharm., 20: 1017-1019, 1983.
85. McAuley, R., Lull, R., and Ice, R.D.: "Bromine-82 Contamination in Fission Product 99mTc-Generator Eluate," Eur. J. Nucl. Med., 10: 60-62, January, 1985.
86. Ice, R.D.: "Boron-10 Precursor Products for Boron Neutron Capture Therapy" in Proceedings Boron Compounds Suitable for Neutron Capture Therapy for the Treatment of Cancer, Radiation Research Program, National Cancer Institute, May, 1988.

87. Ice, R.D., and Porter, S.W.: "Hospital Radiation Emergency Planning," in Hospital Health Physics, Research Enterprises, Richland, Washington, Publishers, 245-273, 1993.
88. Ice, R.D.: "History of Medical Radionuclide Production," J. Health Physics 69: 721-727, November, 1995.
89. Ice, R.D., and Karam, R.A.: "Emergency Preparedness at a University Reactor, Lessons Learned," Proceedings of the American Nuclear Society, Safety of Operating Reactors, September, 1995.
90. Jones, K., Hertel, N.E., and Ice, R.D.: "A Biokinetic Model for Cs-137 in the Fetus," J. Health Physics, Submitted.
91. Ice, R.D., and Shaw, S.M.: "Nuclear Pharmacists Find Power in Unity," J.A. Ph.A. 352 and 404, June, 1996.

B. Abstracts and Articles

1. Ice, R.D., and Hall, N.: "Chromatographic Analysis of the Alkaloids of *Ceanothus Americanus*," College of Pharmacy, University of Washington, June, 1959.
2. Ice, R.D., Breckinridge, C.E., and Christian, J.E.: "A Study of the Retention, Excretion and Distribution of 2,3,5-Triiodobenzoic Acid and its Metabolites in the Rat," J. Am. Pharm. Assn., NS6, 122, 1966.
3. Ice, R.D.: "Interdisciplinary Antiauxin Study," Environmental Health Communique, Purdue University, Lafayette, IN, 1: November 2, 1966.
4. Ice, R.D.: Radiation Safety Manual, Temple University, Philadelphia, PA, July, 1967. (Revised July, 1968, and July, 1969)
5. Ice, R.D., Christian, J.E., and Plumlee, M.P.: "Metabolic Rate of 2,3,5-Triiodobenzoic Acid," American Association for the Advancement of Science, New York, December, 1967.
6. Ice, R.D.: Human Usage Radiation Safety Handbook, Temple University, Philadelphia, PA, July, 1968.
7. Ice, R.D.: "Bionucleonics and Christianity," Philadelphia College of Bible, Philadelphia, PA, May, 1970.

8. Ice, R.D.: Environmental Radioassay Handbook, City of Philadelphia, PA, June, 1970.
9. Dugan, M.A., and Ice, R.D.: "Quench Analysis in Liquid Scintillation Counting," Proceedings of the 2nd Intl. Conf. on Organic Scintillators and Liquid Scintillation Counting, University of California, San Francisco, CA, July 1, 1970.
10. Ice, R.D.: "Influence of Dental Radiographic Cones on Radiation Exposure," H.P., 21: 887, 1971.
11. Ice, R.D.: "Radiation Safety in X-Ray Diffraction and Spectroscopy," DHEW Publication No. (FDA) 72: 8009 BRH/DEP 72-73, September, 1971.
12. Ice, R.D.: "Radiopharmaceuticals for the Practitioner," University of Michigan, Ann Arbor, MI, October, 1971.
13. Ice, R.D., Updegrave, W.J., and Bogucki, E.I.: "Influence of Dental Radiographic Cones on Radiation Exposure," Information Sur Kernforschung und Kerntechnik, IKK, P. 17, No. 11, 1971.
14. Dugan, M., and Ice, R.D.: "Dosimetry of Orally Administered Tritiated Thymidine," Tritium Symposium, University of Nevada, NV, September 2, 1971.
15. Briden, D., and Ice, R.D.: "Neutron Measurements in a Medical Betatron X-Ray Beam," H.P., 23: 405-406, 1972.
16. Sturman, M.F., Beierwaltes, W.H., Ryo, U.Y., and Ice, R.D.: "Imaging Functional Nodules of the Adrenal Glands in Relatively Asymptomatic Individuals," J. Nucl. Med., 14: 458-459, 1973.
17. Kirschner, A.S., Ice, R.D., and Beierwaltes, W.H.: "Radiation Dosimetry of ¹³¹I-19-Iodocholesterol," J. Nucl. Med., 14: 416, 1973.
18. Ice, R.D., and Hetzel, K.R.: "Radiation Protection in a Nuclear Pharmacy," Third International Congress on Radiation Protection, International Radiation Protection Association, Washington, DC, September 13, 1973.
19. Ice, R.D.: "How Can New Radiopharmaceuticals Be Made Available to the Greatest Number of Hospitals: Controversy in Nuclear Medicine?," Central Chapter Society of Nuclear Medicine Meeting, Indianapolis, IN, October 25-27, 1973.

20. Clayton, B.D., and Ice, R.D.: "Preparation, Quality Control and Clinical Acceptance of Macrotec," Am. Soc. Hosp. Pharm. Meeting, New Orleans, LA, December 10-14, 1973.
21. Hetzel, K.R., and Ice, R.D.: "Clinical Nuclear Pharmacy," Am. Soc. Hosp. Pharm. Meeting, New Orleans, LA, December 10-14, 1973.
22. McAuley, R.J., Ice, R.D., and Curtis, E.G.: "Establishment of the Limulus Test for In Vitro Pyrogen Detection," Am. Soc. Hosp. Pharm. Meeting, New Orleans, LA, December 10-14, 1973.
23. Blachandran, S., Ryo, U.Y., Beierwaltes, W.H., Shaw, M.J., and Ice, R.D.: "Uptake of Radiolabeled Dilantin (DHP) in Islet Cells," J. Nucl. Med., 15: 476, 1974.
24. Ice, R.D., Wieland, D.M., Beierwaltes, W.H., and Lawton, R.G.: "Synthesis and Concentration of Dopamine Analogs in the Rat," J. Nucl. Med., 15: 503, 1974.
25. Ice, R.D., and Hetzel, R.: "Operational Aspects of a Regional Nuclear Pharmacy," American College of Nuclear Medicine Physicians, June 9, 1974.
26. Ice, R.D., and Hetzel, K.R.: "Hospital Radiopharmaceutical Quality Control," presented at the 21st Annual Meeting on the Society of Nuclear Medicine, San Diego, CA, June, 1974.
27. Kirschner, A.S., and Ice, R.D.: "The Theoretical Effect of Specific Activity of Specific Tissue Localization and Radiation Dosimetry of Labelled Estradiol," J. A.Ph.A., NS14: 297, 1974.
28. Hetzel, K.R., and Ice, R.D.: "The Clinical Practice of Nuclear Pharmacy," J. A.Ph.A., NS14: 297, 1974.
29. Ice, R.D., and Hetzel, K.R.: "Nuclear Pharmacy Health Physics," J. Am.Ph.A., NS14: 297, 1974.
30. Ice, R.D.: "The Practice of Nuclear Pharmacy," Alumni Bulletin, Ferris State College, Big Rapids, MI, No. 2, June, 1974.
31. Ice, R.D.: "Radiopharmaceuticals and Labelled Compounds," Book Reviewed for the Amer. J. Hosp. Pharm., 1974.
32. Ice, R.D., Kirschner, A.S., and Ihlenfield, R.W.: "The Effect of Specific Activity and Tissue Localization

Units of Radiopharmaceutical Design," Academy of Pharmaceutical Science, New Orleans, LA, November 11, 1974.

33. Ice, R.D.: Panel Discussion, "Education in Nuclear Pharmacy," J. A.Ph.A., NS14: 297, 1974.
34. Ice, R.D.: "Nuclear Medicine: Federal and Local Regulations," Third Radiopharmaceutical Workshop, William Beaumont Hospital, Royal Oak, MI, November 9, 1974.
35. Porter, W., Ice, R.D., and Hetzel, K.R.: "Establishment of A Nuclear Pharmacy," J. A.Ph.A., NS14: 308, 1974.
36. Ice, R.D.: Panel Discussion, "Federal Regulations in the Practice of Nuclear Medicine," 21st Annual Meeting of the Society of Nuclear Medicine, San Diego, CA, June, 1974.
37. Ice, R.D., Kirschner, A.S., and Ihlenfield, R.W.: "The Effect of Specific Activity and Tissue Localization Units on Radiopharmaceutical Design," Abstracts, 17th National Meeting, A.Ph.A. Acad. of Pharm. Sci., 4: 36, 1974.
38. Lamson, M., Kirschner, A.S., Hotte, C.E., Lipsitz, E., and Ice, R.D.: "Generator Produced $^{99m}\text{TcO}_4$: Carrier Free?," J. Nucl. Med., 15: 541-542, June, 1975.
39. Kirschner, A.S., and Ice, R.D.: "The Effect of Specific Activity on Tissue Localization and Radiation Dosimetry," J. Nucl. Med., 16: 541-542, June, 1975.
40. Basmadjian, G.P., Hetzel, K.R., Ice, R.D., and Beierwaltes, W.H.: "Synthesis of a New Adrenal Imaging Agent: 6- ^{131}I -Iodomethyl-19-Norcholest-5(10)-en-3B-01 (NP-59)," J. Nucl. Med., 16: 514, June, 1975.
41. Sarkar, S.D., Ice, R.D., Beierwaltes, W.H., Basmadjian, G.P., Hetzel, K.R., and Kennedy, W.P.: "6B-I- ^{131}I -Iodomethyl-19-Norcholest-5(10)-en-3B-01 (NP-59) Concentrates in the Adrenal Gland Better than I- ^{131}I -Iodocholesterol," J. Nucl. Med., 17: 212-221, June, 1975.
42. Sarkar, S.D., Ice, R.D., Beierwaltes, W.H., Basmadjian, G.P., Kennedy, W.P., and Mosley, S.T.: "Sec-75-19-Selenocholesterol: A New Imaging Agent," J. Nucl. Med., 15: 565, June, 1975.

43. Gill, S.P., Beierwaltes, W.H., Ice, R.D., and Mosley, S.T.: "A New Radiolabeled Quinoline Analog in Mice and Malignant Melanoma," J. Nucl. Med., 16: 530, June, 1975.
44. Seabold, J.E., Beierwaltes, W.H., Zakem, J.F., Wieland, D.M., and Ice, R.D.: "A New Radiopharmaceutical Approach for Adrenal Imaging Agent," J. Nucl. Med., 16: 566, June, 1975.
45. Ice, R.D.: "Pharmacy-Responding to Needs," Faculty-Student Seminar, College of Pharmacy, University of Michigan, February 12, 1975.
46. Ice, R.D., Shaw, S.M., Born, G.S., George, R.E., and Hetzel, K.R.: "The Role of the Nuclear Pharmacist in Nuclear Medicine," International Symposium on Radiopharmaceuticals, Atlanta, GA, February 14, 1975.
47. Ice, R.D.: "Regulations for Nuclear Pharmacies," Dist. 8, 33rd Annual Meeting of the American Association of Colleges of Pharmacy and National Association of Boards of Pharmacy, San Francisco, CA, October 13-15, 1974.
48. Ice, R.D.: Panel Discussion: "Licensure of Radiopharmacies: Critique of the Arizona Regulations," NABP Newsletter 4: 18, 1975.
49. Ice, R.D.: Nuclear Pharmacy Workshop: "Pharmacy Services for Nuclear Medicine," J. A.Ph.A., NS15: 121, 1975.
50. Ice, R.D.: Panel Discussion: "Symposium on Education in Nuclear Chemistry with Emphasis on Applications to Nuclear Medicine," 170th National Meeting of the American Chemical Society, Chicago, IL, August 28, 1975.
51. Ice, R.D.: Comments to FDA Radiopharmaceutical Advisory Committee, FDA Hearings, Washington, DC, April 24, 1975.
52. Ice, R.D.: "Significant Changes - Rules and Regulations in Nuclear Medicine," Central Chapter Meeting, Soc. of Nuc. Med., Detroit, MI, March 5, 1976.
53. Gill, S.P., Beierwaltes, W.H., Ice, R.D., and Kramer, E.M.: "Localization of Radiolabeled Phosphates in Breast Carcinoma," American Association for Cancer Research, Journal of Clinical Research, 107, March, 1976.

54. Hotte, C.E., and Ice, R.D.: "A Kinetic Treatment of Radiopharmaceutical Decomposition," 19th Annual Meeting of the A.Ph.A., New Orleans, LA, April 6, 1976.
55. Ice, R.D.: "Panel Discussion of Regulatory Control for Radiopharmaceuticals," 10th Annual Meeting, A.S.H.P., Washington, DC, December 9, 1975.
56. Rowles, S.G., and Ice, R.D.: "Development of Rules Regulating Radiopharmaceuticals in Michigan," 19th Annual Meeting of the A.Ph.A., New Orleans, LA, April 6, 1976.
57. Ice, R.D., Kircos, L.T., Coffey, J.L., Watson, E., Sakar, S.D., and Beierwaltes, W.H.: "Radiation Dosimetry of 6-131-I-Iodomethyl-norcholesterol, Symposium on Radiopharmaceutical Dosimetry," Oak Ridge, TN, April, 1976.
58. Sarkar, S.D., Cohen, E.L., Beierwaltes, W.H., Ice, R.D., Gill, S.P., and Gold, E.N.: "6-Beta-19-Nor-Iodocholesterol: A Superior Adrenal Imaging Agent in Humans," Endocrine Society, 58th Annual Meeting, *Endocrinology* 98: 242, June, 1976.
59. Beierwaltes, W.H., Wieland, D.M., Ice, R.D., Seabold, J.E., Sarkar, S.D., Gill, S.P. and Mosley, S.T.: "Uptake and Release of Radiolabeled Enzyme Inhibitors from Adrenal Cortex of the Rat and Dog," Endocrine Society, 58th Annual Meeting, *Endocrinology* 98: 58, June, 1976.
60. Kirschner, A.S., and Ice, R.D.: "The Theoretical Effect of Radiopharmaceutical Specific Activity of Absorbed Radiation Dose," Symposium on Radiopharmaceutical Dosimetry, Oak Ridge, TN, April, 1976.
61. Ice, R.D.: "Radiopharmaceutical Quality Control by Instant Thin Layer Chromatography," Current Laboratory Practice, Gelman Instrument Company, May, 1976.
62. Basmadjian, G.P., Kirschner, A.S., Mills, S.K., Barker, K., and Ice, R.D.: "Formulation and Stability of 99m-Tc-Methylene Diphosphonate Kits," 21st Annual Meeting of the A.Ph.A., Montreal, Canada, May 16, 1978.
63. Basmadjian, G.P., Parker, G.R., Kirschner, A.S., Ice, R.D., Magarian, R.A., and Mills, S.L.: "Facile Method for the Introduction of Te-123m Into Organic Molecules, Synthesis of 3-Methyl-Tellurocholesterol," SNM 25th Annual Meeting, Anaheim, CA, June, 1978.

64. Sarkar, S.D., Cohen, E.L., Beierwaltes, W. H., Ice, R.D., Gill, S.P., and Gold, E.N.: "6B-19-Nor-Iodocholesterol (NP-59): A Superior Adrenal Imaging Agent in Humans," J. Nucl. Med., 17: 563, June, 1976.
65. Wieland, D.M., Ice, R.D., and Beierwaltes, W.H.: "Synthesis of Radiolabeled Enzyme Inhibitors of the Adrenal Cortex," J. Nucl. Med., 17: 525, June, 1976.
66. Ice, R.D., Kircos, L.T., Coffey, J.L., Watson, E., Sarkar, S.D., and Beierwaltes, W.H.: "Radiation of Dosimetry of I-131-6-Iodomethyl-Norcholesterol," J. Nucl. Med., 17: 540, June, 1976.
67. Ice, R.D., Keese, R.F., Shaw, S.M., and Wolf, W.: "Final Report of the Special Committee on Radiopharmacy," Am. J. Pharm. Ed., 3, 492, October, 1975.
68. Prestidge, D.J., and Ice, R.D.: "Nuclear Pharmacy Curriculum and Regulations," 51st Annual Meeting, Sixth District, NABP and AACP, Hot Springs, AK, October 11, 1976.
69. Ice, R.D.: "Special Session Radiopharmaceutics," 77th Annual Meeting, AACP, Minneapolis, MN, July 19, 1976.
70. Wieland, D.M., Kennedy, W.P., Ice, R.D., and Beierwaltes, W.H.: "Radioiodinated Pyridines-Potential Adrenocortical Imaging Agents," J. Labelled Comp. & Radiopharm., 13: 299, 1977, September 23, 1976.
71. Yu, T., Wieland, D.M., Ice, R.D., and Beierwaltes, W.H.: "Synthesis of Labelled 3-Iodocholesterols for Adrenal Imaging," Abstract, J. Labelled Comp. & Radiopharm., 13: 274, 1977.
72. Ice, R.D.: "Technetium-99m: Physics, Chemistry, Quality Control," Nuclear Radiology Workshop, University of Michigan, Ann Arbor, MI, May 7, 1976.
73. Ice, R.D., and Hetzel, K.R.: "Thin Layer Speeds Hospital Lab Assay," Industrial Research, Cl, July, 1976.
74. Ice, R.D.: "Nuclear Pharmacy Regulations at the Crossroads," 73rd Annual Meeting of NABP, St. Louis, MO, May 24, 1977.
75. Ice, R.D.: "Dr. Ice, Assumes O.U. Dean Position, Oklahoma Pharmacist," Vol. 43, September, 1976.

76. Porter, M.E., Covington, T.R., Ice, R.D.: "Fee Service, a Professional Practice Plan for Pharmacy Faculty," 78th AACP Annual Meeting, Seattle, WA, August, 1977.
77. Beierwaltes, W.H., Ice, R.D., and Kirschner, A.S.: "Effect of Specific Activity and Expression of Per Cent Uptake in Tissue," IAEA Symposium, Vienna, Austria, December, 1974.
78. Ice, R.D.: "Pharmacy Dean Named: College Moves to HSC," Update, 1, August, 1976.
79. Basmadjian, G.P., Ice, R.D., and Hetzel, K.R.: "Synthesis and Biodistribution of 75-Se-6-Benzylselenomethyl-19-Norcholest-5-(10-en-3B-ol (BseC)," First Annual Meeting on General Radiopharmaceutical Science, Atlanta, GA, January 22, 1978.
80. Ice, R.D.: "What is Clinical Nuclear Pharmacy and Where is it Going?," Rocky Mountain Chapter of the Society of Nuclear Medicine, Albuquerque, NM, April 6, 1978.
81. Ice, R.D.: "The Pharmacist and the Rural Health Team," Mid-Winter Faculty Convocation, Tulsa Medical College, Tulsa, OK, February 13, 1978.
82. Ice, R.D., Basmadjian, G.P., Parker, G.R., Mills, S.L., Magarian, R.A., and Kirschner, A.S.: "Tellurium-123m, A Substitute for Carbon in Organic Radiopharmaceuticals," Rocky Mountain Chapter of the Society of Nuclear Medicine, Albuquerque, NM, April 7, 1978.
83. Basmadjian, G.P., Mills, S.L., Parker, G.P., Kirschner, A.S., Ice, R.D., and Magarian, R.A.: "16-Methyl-Telluro-Te-123m-9-Hexadecanoic Acid: A Potential Myocardial Agent," SNM 25th Annual Meeting, Anaheim, CA, June, 1978.
84. Basmadjian, G.P., Parker, G.R., Magarian, R.A., Kirschner, A.S., and Ice, R.D.: "Potential Te-123m Radiopharmaceuticals: A Simple Method for the Introduction of Te-123m into Organic Compounds," J. Labelled Comp. & Radiopharm., 16: 33-34, January, 1979.
85. Basmadjian, G.P., Ice, R.D., Magarian, R.A., Parker, G.R., Mills, S.L., and Kirschner, A.S.: "Design and Development of Te-123m Labelled Radiopharmaceuticals,"

American Journal of Roentgenology, 132: 487, March, 1979.

86. Gilliland, D.L., Basmadjian, G.P., Kirschner, A.S., Leonard, J.C., Ice, R.D., and Kurkjian, H.T.: "Development of a Lymphoscintigraphy Agent," Second International Symposium on Radiopharmaceuticals, Seattle, WA, March 20, 1979.
87. Basmadjian, G.P., Magarian, R.A., Parker, G.R., Mills, S.L., Kirschner, A.S., and Ice, R.D.: "16-Methyltelluro-Te-123m-9-Hexadecanoic Acid: A Potential Myocardial Scanning Agent," J. Labelled Comp. & Radiopharm., 16: 160-161, January, 1979.
88. Ice, R.D., and Barker, K.: "Nuclear Pharmacy Economics," 22nd Annual Meeting of the A.Ph.A., Anaheim, CA, April 24, 1979.
89. Kirschner, K.S., Hinkle, G.H., Basmadjian, G.P., and Ice, R.D.: "Evaluation of a Kit Preparation of Radioactive-O-Iodohippuran," 22nd Annual Meeting of the A.Ph.A., Anaheim, CA, April 24, 1979.
90. Basmadjian, G.P., Gilliland, D.L., Leonard, J.C., Kirschner, A.S., and Ice, R.D.: "Para-Aortic Lymph Node Visualization in Dogs Using Tc-99m-P04," J. Nucl. Med., 20: 654, June, 1979.
91. Magarian, R.A., Parker, G.R., Basmadjian, G.P., Kirschner, A.S., and Ice, R.D.: "Development of New Radiopharmaceuticals: Role of the Medicinal Chemist," Sixth Annual MALTO Medicinal Chemistry-Pharmacognosy Meeting, University of Mississippi, Oxford, MS, May 24-25, 1979.
92. Hinkle, G.H., Barker, K.K., Basmadjian, G.P., and Ice, R.D.: "Clinical Nuclear Pharmacy: Participation in the Investigational New Drug Application," 23rd Annual Meeting of the A.Ph.A., Washington, DC, April 22, 1980.
93. Basmadjian, G.P., Ice, R.D., Parker, G.R., Magarian, R.A., Mills, S.L., and Kirschner, A.S.: "Synthesis of 123m Nucleophiles: Potential Use in the Synthesis of New Te-123m Radiopharmaceuticals," Third International Symposium on Selenium and Tellurium Chemistry, Metz, France, July 12, 1979.
94. Levine, G., Dirkson, J.W., Shaw, S., Ice, R.D., and Williams, R.: "A Brief History of the APhA, Academy Pharmacy Practice, Section of Nuclear Pharmacy-1973 was Indeed a Very Good Year," 22nd Annual Meeting of the

A.Ph.A., American Institute History of Pharmacy,
Anaheim, CA, April 24, 1979.

95. Ice, R.D.: "What Nuclear Pharmacy Needs Now," Invited Lecture, Joint Session, Academies of Pharmacy Practice and Pharmaceutical Science, 23rd Annual Meeting of the A.Ph.A., Washington, DC, April 22, 1980.
96. Ice, R.D.: "Perspectives on Nuclear Pharmacy Regulations (two presentations)," National Conference on Regulation and Inspection of Nuclear Pharmacies, Albuquerque, NM, November 18-19, 1980.
97. Ice, R.D.: "Nuclear Energy - Cure or Crisis," Keynote Lecture, Bienfang Seminar, University of Oklahoma, Tulsa, OK, November 8, 1980. (Variations of this presentation were given to the Christian Medical Society and numerous Rotary, Kiwanis, Engineer Clubs and Pharmacy Associations.)
98. Ice, R.D.: "Ph.D. Programs in Nuclear Pharmacy," Invited Lecture, Nuclear Pharmacy Section, Academy of Pharmacy Practice, 24th Annual Meeting of the A.Ph.A., St. Louis, MO, March 31, 1981.
99. Barker, K.K., Basmadjian, G.P., Hinkle, G.H., and Ice, R.D.: "Interdisciplinary Approach to Radiopharmaceutical-Pharmaceutical Interaction Screening," Academy of Pharmacy Practice, 24th Annual Meeting of the A.Ph.A., St. Louis, MO, March 30, 1981.
100. Hinkle, G.H., Basmadjian, G.P., Peek, C., Barker, K.K., and Ice, R.D.: "Abnormal Distribution of Tc-99m Glucoptate Sodium," Academy of Pharmacy Practice, 24th Annual Meeting of the A.Ph.A., St. Louis, MO, March 30, 1981.
101. Fung, T.J., Basmadjian, G.P., and Ice, R.D.: "Nuclear Pharmacy Management Information Retrieval System," First European Symposium on Radiopharmacy and Radiopharmaceuticals, Copenhagen, Denmark, March 30, 1983.
102. Basmadjian, G.P., Sadek, S., and Ice, R.D.: "Selenium Se-75 Radiopharmaceuticals," 4th Int. Conf. on the Organic Chemistry of Selenium and Tellurium, Birmingham, England, July, 1983.
103. Basmadjian, G., Johnston, J., Barker, K.K., and Ice, R.D.: "Trends in Radiopharmaceutical Dispensing in a Regional Nuclear Pharmacy, Academy of Pharmacy Practice," 25th Annual Meeting of the A.Ph.A., Las

Vegas, NV, April 1982.

104. Basmadjian, G., Johnston, J., Barker, K.K., and Ice, R.D.: "Trends in Radiopharmaceutical Dispensing in a Regional Nuclear Pharmacy," Third World Congress of Nuclear Medicine and Biology, Paris, France, September 2, 1982.
105. Basmadjian, G.P., Fung, T.J., Barker, K.K., and Ice, R.D.: "Nuclear Pharmacy Management Information Retrieval System," 26th Annual Meeting of the A.Ph.A., New Orleans, LA, April 9-14, 1983.
106. Chan, S.M., Basmadjian, G.P., Marten, D.F., Sadek, S., Magarian, R.A., Grunder, J.R., and Ice, R.D.: "Synthesis and Biodistribution of Radioiodinated 5-Iodo-Nicotine," Society of Nuclear Medicine 30th Annual Meeting, St. Louis, MO, June 7-10, 1983.
107. Chan, S.M., Basmadjian, G.P., Marten, D.F., Sadek, S., Magarian, R.A., Grunder, J.R., and Ice, R.D.: "Synthesis and Biodistribution of Radioiodinated 5-Iodo-Nicotine," Journal of Nuclear Medicine and Biology, 24: 116, 1983.
108. Gilliland, D.L., Basmadjian, G.P., Marchand, A.P., Hinkle, G.H., and Ice, R.D.: "Iodine Labelled Radiopharmaceuticals from Arylthallium Bis (Trifluoroacetate) Intermediates," Banff Conference, Banff, Canada, 1982.
109. James, M.R., Basmadjian, G.P., Leonard, J.C., and Ice, R.D.: "Desferoxamine Mesylate: Its Use in Reducing Radiation Burden in Pediatric Patients Injected with Gallium-67 Citrate," 3rd World Congress of Nuclear Medicine and Biology, Paris, France, August, 1982.
110. Basmadjian, G.P., Mills, S.L., and Ice, R.D.: "Synthesis, Biological Distribution and Radiation Dosimetry of Te-123m Analogs of Hexadecenoic Acid," 3rd World Congress of Nucl. Med. and Biol., Paris, France, August, 1982.
111. Basmadjian, G.P., Sadek, S., and Ice, R.D.: "Synthesis of 75-Selenium-Labeled Catecholamine Derivatives; Adrenal Medulla Tumor Specific Radiopharmaceuticals," 4th Int. Symp. on Radiopharmaceutical Chemistry, Julich, FRG, August 26, 1982.
112. Basmadjian, G.P., Gilliland, D.L., Marchand, A.P., Magarian, R.A., and Ice, R.D.: "Synthesis of Radioiodinated Cis-and Trans-1, 2-Diphenyl-3, 3-

Dichloro-Cyclopropanes: Potential Radiopharmaceuticals for Estrogen Dependent Tumors," International Symposium in Radiopharmaceutical Chemistry, Julich, FRG, August 26, 1982.

113. Ice, R.D.: "Nuclear Pharmacy Practice in Russia and China," 27th Annual Meeting of the A.Ph.A., Montreal, Canada, May 5-10, 1984.
114. Ice, R.D.: "I-123 vs. I-131 and Tc-99m for Thyroid Imaging," 10th Annual Meeting of the Georgia Society of Nuclear Medicine Technologist, Stone Mountain, GA, April 28, 1984.
115. Ice, R.D.: Book Review, Medication and the Elderly, by W. Simonson, J. Gerontology, 39, 510, April, 1984.
116. Chan, S.M., Basmadjian, G.P., Marten, D.F., Sadek, S., Magarian, R.A., Grunder, J.R., and Ice, R.D.: "Synthesis and Biodistribution of Radioiodinated Nicotine Analogs," J. Nucl. Med., 25: 121, 1984
117. Chan, S.M., Basmadjian, G.P., Marten, D.F., Sadek, S., Magarian, R.A., Grunder, J.R., and Ice, R.D.: "Synthesis and Biodistribution of Radioiodinated Nicotine Analogs," 1984 Annual Meeting, Soc. of Nuc. Med., Los Angeles, CA, June 13, 1984.
118. Ice, R.D.: Future Development in Radiopharmaceuticals, Missouri Valley Chapter Soc. of Nuc. Med., October 14, 1984.
119. Ice, R.D., Moderator: International Symposium on Drug Quality Assurance in the Hospital, Toronto General Hospital and University of Toronto, Toronto, Canada, June 11, 1984.
120. Ice, R.D.: "Boron-10 Precursor Products for Boron Neutron Capture Therapy," Workshop, Radiation Research Program, National Cancer Institute, May 3, 1988.
121. Pham, T., Edens, B., Potts, T., Shaw, M. and Ice, R.D.: "The Role of Isotopic B-10 as a Tracer in the Preparation of Decaborane," Boron USA (BUSA II), Raleigh-Durham, NC, 1990.
122. Ice, R.D.: "Neutron Capture Therapy," 34th Annual Meeting, A.Ph.A., New Orleans, LA, 1991.
123. Morre', D.J., Ice, R.D., and Boone, J.: "Color-Change-Based Detection of Bacterial Toxins, US Army Chemical Research, Development and Engineering Center,

Scientific Conference on Chemical Defense Research,
November, 1991.

124. Evans, T. M., and Ice, R.D.: "BNCT Rodent Phantom Dosimetry at the Georgia Tech Research Reactor," Health Physics Supplement, 66, 39th Annual Meeting of the H.P. Soc., San Francisco, CA, June 30, 1994.
125. Tarpley, C. and Ice, R.D.: "Radiopharmaceutical Exposures," Health Physics Supplement, 68, S85, 40th Annual Meeting of the H.P. Soc., Boston, MA, July 26, 1995.
126. Fitzgerald, M.R., Goetz, B.B., and Ice, R.D.: "Development and Marketing of a Quality Management Program (QMP)," Health Physics Supplement, 68, S87, 40th Annual Meeting of the H.P. Soc., Boston, MA, July 26, 1995.
127. Ice, R.D.: Book Review, "Radiation Protection Handbook for Laboratory Workers," Hlth. Phys., 68, p. 125, No. 1, January, 1995.
128. Ice, R.D.: Book Review, "Handling of Radiation Accident Patients by Paramedical and Hospital Personnel," Hlth. Phys., 68, p. 737, No. 5, May, 1995.
129. Ice, R.D.: Book Review, "Safety Assessment of Research Reactors and Preparation of the Safety Analysis Report, IAEA Safety Series No. 35-G1," Hlth. Phys., 69, p. 423, No. 3, September, 1995.
130. Ice, R.D.: Book Review, "Safety in the Utilization and Modification of Research Reactors, IAEA Safety Series, No. 35-G2," Hlth. Phys., 69, p. 423, No. 3, 1995.
131. Ice, R.D.: Book Review, "Intervention Criteria in a Nuclear or Radiation Emergency, IAEA Safety Series, No. 109," Hlth. Phys., 69, p. 424, No. 3, 1995.
132. Schinazi, R.F., Fulcrand, G., Juodawlakis, A., Loyd, R.M., Liberman, I., Ice, R.D., and Lesnikowski, Z.: "Carboranyl Oligonucleotides as Molecular Warheads for Boron Neutron Capture Therapy and Gene Therapy," Winship Cancer Center Molecular Therapeutics Program, Emory University, Atlanta, GA, No. 16, 1995.
133. Ice, R.D.: "Olympic Health Physics," Health Physics Supplement, 72, SXX, 42nd Annual Meeting of the H.P. Soc., San Antonio, TX, July, 1997.
134. Morabito, B., Ice, R.D., and Lesnikowski, Z.J.:

"Quantitating Radiation Induced Breaks by Capillary Electrophoreses," Health Physics Supplement, 72, SXX, 42nd Annual Meeting of the H.P. Soc., San Antonio, TX, July, 1997.

C. CHAPTERS IN BOOKS

1. Ice, R.D.: "Radioactive Dosage Forms," Sprowl's American Pharmacy, 7th Ed., edited by R.W. Dittert, Lippincott, Philadelphia, PA, 1974. 423-450.
2. Ice, R.D.: "Design of Radiopharmaceuticals," Drug Design, Vol. VI, edited by E.J. Ariens, Academic Press, New York, NY, 1975.
3. Ice, R.D.: "Sterilization and Sterility Testing," Quality Control in Nuclear Medicine, edited by B.A. Rhodes, C.V. Mosby and Co., St. Louis, MO, 1977.
4. Ice, R.D.: "Nuclear Pharmacy," Handbook of Institutional Pharmacy Practice, edited by M.C. Smith and T.R. Brown, Williams and Wilkins, Baltimore, MD, 1979. 449-458.
5. Ice, R.D.: "Practical Generator Kinetics," Basics of Radiopharmacy, by B.A. Rhodes and B.Y. Howard, C.V. Mosby Co., St. Louis, MO, 1978, 163-172.
6. Ice, R.D. and Wright, M. Sister: "NABP Perspectives on Nuclear Pharmacy Regulations," Proceedings of a National Conference on Regulations and Inspections of Nuclear Pharmacies, edited by B.E. Friedman and W.B. Hladik, III, College of Pharmacy, U. of New Mexico, Albuquerque, NM, 1982, 69-74.
7. Ice, R.D.: "Conference Highlights," Proceedings of a National Conference on Regulation and Inspections of Nuclear Pharmacies, ed. by B.E. Friedman and W.B. Hladik, III, College of Pharmacy, U. of New Mexico, Albuquerque, NM, 1982, 112-117.
8. Ice, R.D.: "Clinical Use of Radiopharmaceuticals," Radiopharmaceuticals and other Applications of Radioactivity and Radiation in Medicine, ed. by S.M. Shaw and R.E. George, Marcel Dekker, Inc., NY, 1980.
9. Hladik, W.B., Ponton, J.A. and Ice, R.D.: Chapter VI.5 "Nuclear Pharmacy," in Handbook of Institutional Pharmacy Practice, ed. by R. Brown and M.C. Smith, Williams and Wilkins, Baltimore, MD, 1985.
10. Ice, R.D. and Shaw, S.M.: "Radiopharmaceuticals," in

Ausman and Snyder's Medical Library, Lawyers Edition, 1992.

D. BOOKS

1. Radiopharmaceuticals II, ed. by V.J. Sodd, D.R. Allen, D.R. Hoagland, and R.D. Ice, Society of Nuclear Medicine, New York, NY, 1979.

E. PATENTS

1. Bacterial Toxin Biosensor, Patent Applied for November, 1991.

F. VISITING PROFESSORSHIPS AND NON-ABSTRACTED PRESENTATIONS AT PROFESSIONAL MEETINGS

1. Ice, R.D., Breckinridge, C.E. and Christian, J.E.: "Synthesis of 131-I-2,3,5-Triiodobenzoic Acid," TIBA Workshop, International Minerals and Chemicals Corp., Skokie, IL, September, 1965.
2. Ice, R.D., Christian, J.E. and Plumlee, M.P.: "TIBA Distribution, Metabolism, and Whole Body Retention in Goats," TIBA Workshop, Int., Min. and Chem. Corp., Skokie, IL, 1966.
3. Ice, R.D.: "University Radiation Safety Practices," 2nd National Conference of University radiation Safety Officer, Rensselaer Polytechnic Institute, Troy, NY, August, 1969.
4. Ice, R.D.: "Radiopharmaceuticals," Delaware Valley Society of Hospital Pharmacists, Philadelphia, PA, May, 1970.
5. Ice, R.D.: Visiting Professor, Radiological Health, Rutgers University, New Brunswick, NY, November, 1970.
6. Ice, R.D.: Visiting Professor, Nuclear Pharmacy, Purdue University, La Fayette, IN, April, 1963.
7. Ice, R.D.: Visiting Professor, Nuclear Pharmacy, Ferris State College, Big Rapids, MI, March, 1974.
8. Ice, R.D.: Visiting Professor, Nuclear Pharmacy, University of Miami, Miami, FL, April, 1974.
9. Ice, R.D.: Visiting Professor, Nuclear Pharmacy, University of Southern California, CA, October, 1975.
10. Ice, R.D.: Visiting Professor, Nuclear Pharmacy,

University of California at San Francisco, CA, October, 1975.

11. Ice, R.D.: "A Christian Vie of Energy and Ecology," University of Oklahoma, Christian Medical Society, April 6, 1980.
12. Ice, R.D.: Visiting Professor, College of Pharmacy, N.E. Louisiana State University, March 19, 1981.

III. GRADUATE STUDENT GUIDANCE

- | A. | <u>Master of Science</u> | <u>Topic</u> |
|-----|--------------------------|---|
| 1. | Bogucki, E.I. | 1967 Dental X-Ray Dosimetry |
| 2. | Cassara, R.D. | 1968 Philadelphia Radiation Safety |
| 3. | Clemons, P.E. | 1969 TLD of Panographic X-Rays |
| 4. | Kaufer, G. | 1969 Radionuclide Chelation Therapy |
| 5. | Pettingill, H.J. | 1971 Tc Labeled Fibrinogen |
| 6. | Troetel, W. | 1969 Synthesis of C-14 Meperidine |
| 7. | Bartlett, J.M. | 1970 Tc Labeled Fibrinogen |
| 8. | Bicehouse, H. | 1970 Binding of Organic Tritium |
| 9. | Bercz, C.V. | 1970 Synthesis of Meperdine Precursor |
| 10. | Briden, D. | 1970 Neutron Dosimetry III |
| 11. | Jenkes, T. | 1970 TLD in a University R.C.O. |
| 12. | Monte, J. | 1970 Radioassay of Environmental PBI |
| 13. | Hetzel, K.R. | 1971 TcO Colloid |
| 14. | Kirschner, A. | 1971 11-C-Dopamine |
| 15. | McAuley, R. | 1973 Pyrogen Detection by "Limulus" |
| 16. | Ihlenfield, W. | 1974 Specie Specificity of Radiopharmaceuticals |
| 17. | She, V. | 1975 Xenon-133 Waste Disposal |
| 18. | Wetherill, R. | 1975 Dosimetry and Decomposition of Para RIBA |
| 19. | Lamson, M. | 1977 Technetium Chemistry |
| 20. | Behm, H. | 1977 Nuclear Pharmacy Practice |
| 21. | Evans, T. | 1999 BNCT/GTRR Beam Characterization |
| 22. | Tarpley, C. | 1995 Radiopharmaceutical Exposures |
| 23. | Martin, J. | 1995 X-Ray Protection |
| 24. | Morabito, J. | 1997 Capillary Electrophoresis |
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- | B. | <u>Doctor of Pharmacy</u> | |
|----|---------------------------|--|
| 1. | Kelly, W. | 1972 Evaluation of TcS Colloid for Human Use |

- | | | |
|-----|---------------|---|
| 2. | Hotte, C. | 1972 Radiodecomposition of Iodocholesterol |
| 3. | Nelson, S. | 1972 I-131 Labeled Fibrinogen |
| 4. | DeSpigno, V. | 1972 Technetium Medicinal Chemistry |
| 5. | Clayton, B. | 1973 Clinical Evaluation of Technetium Macro-Aggregated Albumin |
| 6. | Schiefe, R. | 1973 Labeled Oleic Acid for Myocardial Scanning |
| 7. | Porter, W. | 1974 Establishment of a Nuclear Pharmacy |
| 8. | Vellucci, A. | 1974 Tc-99m Dithizone for Pancreas Scanning |
| 9. | Robertson, J. | 1975 Dosimetry and decomposition of Selenocholesterol |
| 10. | Merryman, R. | 1975 Thioglucose Labeling |
| 11. | Vivian, A. | 1976 Radiochemical Purity Evaluation |

C. Doctor of Philosophy

- | | | |
|----|---------------------|--|
| 1. | Dugan, (Leeper) M. | 1971 Gonadal Dosimetry of Tritiated Thymidine |
| 2. | Monte, (Piccone) J. | 1973 Tumor Detection by Ultrasound |
| 3. | Kerschner, A. | 1975 Pharmacokinetics of Tissue Specific Drugs |
| 4. | Hotte, C. | 1976 Radiopharmaceutical Stability |
| 5. | Mills, S. | 1980 Tellurium Labeled Fatty Acids |
| 6. | Jones, K. | 1996 Fetal Dosimetry of Cs-137 |

D. Post Doctoral

- | | | |
|----|---------------------|------|
| 1. | Wieland, D. | 1973 |
| 2. | Basmdjian, G. | 1974 |
| 3. | El Masry, A.H. | 1975 |
| 4. | Yu, Terry | 1976 |
| 5. | Mukadopating, Sunil | 1976 |
| 6. | Parker, G. | 1978 |
| 7. | Sadek, S. | 1981 |

IV. RESEARCH

A. Areas of Interest

1. New Products Design and Development
2. Radiopharmaceuticals

B. Current Projects

1. Boron Neutron Capture Therapy
2. Theoretical Basis of Radiopharmaceutical Stability
3. Auger' Dosimetry
4. Theoretical Basis of Radiation-Induced DNA Breaks



**Georgia Institute
of Technology**

July 8, 1997

Office of the President

Docket No. 50-160

IN CONFORMANCE

Mr. Ward Winer, Ph.D.
Regents Professor and Chair
School of Mechanical Engineering
Georgia Institute of Technology
Atlanta, GA 30332-0405

Dear Ward:

Georgia Tech has made the decision to permanently cease the operation of our nuclear research reactor and intends to apply for a Possession-Only-License(P-O-L) and immediately begin to prepare a Site Characterization Plan and develop a Decommissioning Plan and cost estimate.

During this process, it will be necessary to have a Technical Safety Review Committee to provide technical and management oversight of the decommissioning activities of the GTRR. Specifically, the Committee will:

- ♦ Review and approve changes to existing GTRR Technical Specifications. Changes to the technical specifications will be prepared by NES, Inc. in conjunction with GTRR's technical staff. This document will be submitted to the NRC.
- ♦ Review and approval of a Radiological and Hazardous Site Characterization Plan. This document will be prepared by NES, Inc.
- ♦ Review and approval of the end-use of the facility and end-point of the decommissioning process. This activity will consist primarily of a Georgia Tech initiative and assisted by NES, Inc. This document will be the basis of the GTRR's Decommissioning Plan and cost estimate.
- ♦ Review and approval of the Decommissioning Plan of the Decommissioning Cost Estimate. These documents will be submitted to the NRC.
- ♦ Review and approval of all communications with the NRC.

I hope that you will serve as a member of the Technical Safety Committee and I appreciate your personal support of this important project.

Sincerely,

Wayne Clough
President

enclosures: Committee Membership

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Atlanta, Georgia 30332-0325 U.S.A.
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A Unit of the University System of Georgia

An Equal Education and Employment Opportunity Institution

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George W. Woodruff School of Mechanical Engineering
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Atlanta, Georgia 30332-0405
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Docket No. 50-160

EDUCATION

University of Michigan - B.S.E. ('58), M.S.E. ('59), Ph.D. ('62) (Mech. Eng.)
Cambridge University/England - Ph.D. (Physics) ('64)

WORK EXPERIENCE

Georgia Institute of Technology, School of Mechanical Engineering - Director '88-present,
Associate Professor '69 - '71, Professor '71 - '84, Regents' Professor '84 - present
Univ. of Michigan, Mech. Eng., Assist. Prof. '63 - '66, Assoc. Prof. '66 - '69
Cambridge University, Department of Physics, Demonstrator '61 - '62
Bundesanstalt für Materialprüfung (Berlin), Visiting Research Scientist, Summer '81
Professional Engineer, State of Georgia, Registration No. 11544

CURRENT FIELDS OF INTEREST

Tribology, including thermal phenomena, wear, elastohydrodynamics, rheology, solid lubricants;
fluid mechanics, thermal systems; engineering education and research policy.

HONORS AND AWARDS (Selected)

'38 Distinguished Service Award, The University of Michigan, 1967
The Monie A. First Memorial Sigma Xi Research Award, 1975
ASME - Melville Medal 1975, Centennial Medallion 1980, Mayo D. Hersey Award, 1986
NASA - Certificate of Recognition, 1977
NLGI 47th Annual Meeting - Clarence E. Earle Memorial Award, 1979
Jacob Wallenberg Foundation Grant, Royal Swedish Academy of Engineering Sciences, 1983
Georgia Tech Faculty of the Year, 1986, Graduate Student Government
Tribology Gold Medal, The British Tribology Trust, 1986
Georgia Tech 1987 Distinguished Professor
Metro Atlanta Engineer of the Year in Education, 1988
Engineers of Greater Atlanta, Engineer of the Year, 1989
National Academy of Engineering, 1988
Fellow ASME, 1980; AAAS, 1988; STLE, 1992
Pi Tau Sigma and ASME Charles Russ Richards Award, 1988
ASEE, Benjamin Garver Lamme Award, 1995

MEMBER (Selected)

National Academy of Engineering, ASME (Fellow), STLE (Fellow), Society of Rheology (AIP), AAUP,
AAAS (Fellow), American Society for Engineering Education, American Academy of Mechanics,
Society for Engineering Science, Tau Beta Pi, Pi Tau Sigma, Phi Kappa Phi, Sigma Xi, STLE
International Award 1997

MAJOR RELEVANT SERVICE ACTIVITIES

ASME Vice President of Research (July '89-'93); Technical Editor, *Transactions of the ASME, Journal of Tribology* (7/80-12/87); ASME, Research Committee on Tribology ('66-present), Chair ('82-'84),
Wear Control Handbook Project, Chair ('75-'80); ASME, Policy Board - Research ('80-'86), Chair ('89-'91),
Committee on Research Needs, Chair ('79-'82), Executive Committee, ASME/NSF Study, "Research Needs in Thermal Systems" ('83-'86), Technology Opportunities Planning Committee ('85-'87),
ASME - Tribology Division ('68-present), Chair ('76-'78); ASME/ASLE, Lubrication Conference Committee ('71-'80), Chair - International Conference ('80); ASLE, Board of Directors (Member), ('83-'86), Society of Rheology, Program Committee for Golden Jubilee Meeting, Boston, MA (10/79),

Bingham Award Committee (Member) ('83-'86), Chair ('85); Society of Engineering Science, Inc., Board of Directors, (1/80-12/85); National Research Council, Committee on Recommendations for U. S. Army Basic Scientific Research (7/80-6/87), Steering Committee (7/82-6/87), Chair Steering Committee (6/84-7/86), Committee on the Tribology of Ceramics (Member) ('85-'86); National Science Foundation, Mechanical Engineering and Applied Mechanics Division Advisory Committee (Member) ('84-'85), Gordon Research Conferences, Friction, Lubrication and Wear, Vice Chairman ('78), Chair ('80), AAUP Ga Tech Chapter Vice President ('71-'72), President ('72-'74), Georgia Conference Vice President ('73-'75), Chair, Georgia Tech Executive Board ('84-'86) Chair, Georgia Tech Presidential Selection Advisory Committee ('87), Technical Advisory Group of the Office of Naval Research Advisory Board for Materials Division ('88), Member, National Nuclear Accrediting Board ('94-'98).

PUBLICATIONS

Dr. Winer has published in excess of 200 papers and reports and given over 190 invited lectures, mostly in the field of tribology. The following are typical of the range of subject matter. He has also advised 22 doctoral students, 20 masters students, and collaborated with 10 postdoctoral visiting scholars. He has been principal investigator on over six million dollars worth of funded research.

1. *Wear Control Handbook*, ASME ('80), (co-editor M. B. Peterson), (1358 pp.).
2. *Research Needs in Mechanical Systems: Report of the Select Panel on Research Goals and Priorities in Mechanical Systems* (prepared for NSF), ASME Special Publication ('83) (with K. N. Reid, H. H. Richardson, M. J. Rabins, R. Cohen, J. A. Callahan, R. E. Garrett, D. T. Koenig).
3. *Research Needs in Thermal Systems: Report of the Select Panel on Research Goals and Priorities in Thermal Systems* (prepared for NSF), ASME Special Publication ('86) (with A. E. Bergies, C. J. Cremers, R. H. Sabersky, W. A. Sirignano, J. W. Westwater).
4. "Glass Transitions in Lubricants: Its Relation to Elastohydrodynamic Lubrication (EHD)," *Bulletin of the Japan Petroleum Institute* 19 (5/77) (with M. Alsaad, S. Bair, D. M. Sanborn).
5. "Surface Temperature Measurements in Rolling and Sliding EHD Contacts," *TRANS. ASLE* 22 3 (7/79) 277 - 285 (with D. M. Sanborn).
6. "Reactively Sputtered Titanium Nitride Coatings for Tribological Applications," *International Journal of Thin Solid Films* 73 ('80) 267 - 274 (with S. Ramalingam).
7. "An Application of a Free Volume Model to Lubricant Rheology I-Dependence of Viscosity of Temperature and Pressure," *TRAN. ASLE, Journal of Tribology* 106, 2 (4/84) (with S. Bair and S. Yasutomi) 304 - 312.
8. "The Tribological Behavior of an Automotive Cam and Flat Lifter System," *TRANS. ASME, Journal of Tribology* 108, No. 3, pp. 478 - 486, 1986 (with S. Bair and J. Griffioen).
9. "Temperature Measurement of Microscopic Areas within a Simulated Head/Tape," *TRANS. ASME, JOURNAL OF TRIBOLOGY*, 108, No. 1, pp. 29 - 34, 1986 (with B. Bhushan, R. Gulino, and S. Bair).
10. "The State of Tribology Research and Activity in the USA," Invited Plenary Lecture at the JSLE International Tribology Conference, Tokyo, 7/85, *Lubrication*, Vol. 31, No. 1, *Journal of Japan Society of Lubrication Engineers* (also translated into Chinese and German for publication), '86.
11. "Effect of a Surface Film on the Surface Temperatures of a Rotating Cylinder," *TRANS. ASME, Journal of Tribology*, 108, No. 1, pp. 92 - 97 ('86) (with B. Gecim).
12. "Transient Temperatures in the Vicinity of an Asperity Contact," *TRAN. ASME, Journal of Tribology*, 107, No. 3, pp. 333 - 342 ('85) (with B. Gecim).
13. "An Experimental Investigation of the Film-to-Substrate Bond Strength of Sputtered Thin Films Using a Semi-Quantitative Test Method," *Trans. ASME, JOURNAL OF TRIBOLOGY*, 107, No. 4, pp. 478 - 482 ('85) (with B. Ting and S. Ramalingham).
14. "A Comparison Between the Thermomechanical Wear Model and Some Experimental Observations," *Trans. ASME, JOURNAL OF TRIBOLOGY*, 113, No. 2, pp. 262 - 269 ('91) (with J. Yang).
15. "The Tribology Community," *Lubrication Engineering*, Vol. 43, No. 12, pp. 930 - 933, 12/87.

16. "Professional Education: An Engineering Point of View," at Symposium, "Professional Education and All That Stuff," The University Center of Georgia, October 24, 1986.
17. "Thermal Mechanical Wear Modelling," presented at ASME Winter Annual Meeting, Dallas, TX (November 27, 1990) (with J.-S. Yang).

(Revised 5/97)



Georgia Institute of Technology

Office of the President

July 28, 1997

Mr. William A. Miller
Project Manager
Office of Facilities
Georgia Institute of Technology
Atlanta, GA 30332-0410

Dear Bill,

Georgia Tech has made the decision to permanently cease the operation of our nuclear research reactor and to apply for a Possession-Only-License (POL). This will require preparation of a Site Characterization Plan, a Decommissioning Plan, and cost estimate.

On June 30, 1997, I appointed a Technical Safety Review Committee to provide technical and managerial oversight of the decommissioning activities of the Georgia Tech Research Reactor. Mr. Bill Ray was appointed as a member of the Committee and also to serve as overall project manager for the decommissioning project. As you know, Mr. Ray is leaving Georgia Tech effective August 15, 1997.

I ask that you assume Mr. Ray's position as a full member of the Technical Safety Review Committee, effective July 28, 1997. I am also appointing you as project manager for this decommissioning project. Your duties and responsibilities as project manager will include:

- Manage the project to ensure completion according to schedule, budget, and the needs of the Institute;
- Oversee and coordinate the activities of professional consultants;
- Facilitate the activities of the Technical Safety Review Committee;
- Oversee the preparation of appropriate management reports to support decision making and to comply with applicable regulations;
- Communicate project status to appropriate Administration officials;
- Oversee the preparation and implementation of an effective public affairs program.

I look forward to working closely with you on this important milestone project in Georgia Tech's history.

Sincerely,

G. Wayne Clough
President

cc: Dr. J. Nari Davidson
Mr. Robert K. Thompson

Georgia Institute of Technology
Atlanta, Georgia 30332-0325 U.S.A.
PHONE 404-894-5051
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An Equal Education and Employment Opportunity Institution

WILLIAM A. MILLER
Capital Project Manager
Facilities Division
Georgia Institute of Technology
Atlanta, Georgia 30332-0410

EDUCATION

Georgia Institute of Technology - B.C.E. (1962), M.S.C.E. (1971)
United States Army War College, Carlisle Barracks, PA - Graduate 1984

WORK EXPERIENCE

Southern Railway Company - Civil Engineer in Training 1961-62
United States Army Corps of Engineers - Commissioned Officer 1962 - 1992, Colonel,
U.S. Army (Retired)
Georgia Institute of Technology - Capital Project Manager 1992 - present
Engineer in Training (EIT) State of Georgia

PROJECT EXPERIENCE

Civil Engineer, Maintenance of Right-of-Way, 1962, Southern Railway
Civil/Quality Control Engineer, Bangkok Bypass Road, Thailand, 1965-66
Technical Writer, Roads and Bridges, U.S. Army Engineer School, Ft. Belvoir, 1967-68
Small Unit Commander, Combat Roads, Bridges, Logistics, U.S. Army Vietnam, 1968-69
Project Manager, U.S. Army Corps of Engineers, Livorno, Italy 1971-73
Area Engineer, Southern Italy, Sicily, U.S. Army Corps of Engineers, 1973-74
Battalion Commander, Military Construction, U.S. Army Europe, 1979-81
Project Manager, Chemical Agent Demilitarization Facility, Johnston Atoll, 1984-87
Vice President, Military Construction, Corps of Engineers, 1988-89
District Engineer, Middle East/Africa District, Corps of Engineers, 1989 - 91
DOD Construction Agent, Desert Shield/Desert Storm, Saudi Arabia, 1990-91
Vice President, Civil Works, South Atlantic Division, Corps of Engineers, 1991-92
Director of Olympic Planning, Georgia Tech, 1992 - 96
Project Manager, Campus Master Planning Project, Georgia Tech, 1996 to present
Project Manager, Nuclear Reactor Decommissioning, Georgia Tech, 1997 to present

PUBLICATIONS

1. *Military Fixed Bridges*, U.S. Army Field Manual, 1967
2. *Asphalt Road Construction*, U.S. Army Corps of Engineers Technical Manual, 1967
3. *Triaxial Stress Behavior of Saturated Concrete in Arch Dams*, Master's Thesis, Georgia Tech, 1971
4. *Home Station Mobilization*, Thesis, U.S. Army War College, 1984
5. *Project Management Guidelines*, Office of Facilities, Georgia Tech, 1997

HONORS AND AWARDS

Outstanding Junior Officer, Officer's Basic Course, 1962
Bronze Star Medal, U.S. Army Vietnam, 1969
Legion of Merit, U.S. Army (two awards 1987, 1992)
Distinguished Service Medal, U.S. Army, 1992
Silver DeFluer Medal, The Engineer Regiment, 1992
Administrator of the Year, 1996, Georgia Tech