Washington
State University

Nuclear Radiation Center, Pullman, Washington 99164-1300 / 509-335-8641

March 10, 1989

Alexander Adams, Jr.
Project Manager
Standardization & Non-Power Reactor
Project Directorate
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
MS WF1-11H3
Washington, DC 20555

Dear Mr. Adams:

Over the past year since Dr. Roy Filby resigned as Director of the Radiation Center to become Chairman of the Department of Chemistry and Dr. David Barbee of the Vet School was appointed Interim Director, a number of problems have occurred at the Radiation Center. My health is deteriorating due to a medical problem that is significantly exacerbated by stress and thus I will be retiring on 7/1/89.

It is not clear to me at this point in time what responsibilities I have in relation to the requirements of T.S. 6:10(3)C & D. The ^{60}Co source and other problems may be viewed as being directly related to the manner in which the Center is now being managed. You might want to call Dr. Filby at 509-335-3331 before calling me at 509-335-8317 with any advice. He can give you his view of the situation. He is now a member of the Reactor Safeguards Committee.

Sincerely,

W. E. Wilson

W.E. Wilson
Associate Director

Enclosure
WEW:crc

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1/1

Washington
State University

Nuclear Radiation Center, Pullman, Washington 99164-1300 / 509-335-8641

MEMORANDUM

TO: David Barbee, R.V. Smith and Reactor Safeguards Committee

FROM: Bill Wilson W. E. Wilson

DATE: March 9, 1989

SUBJECT: My retirement and its impact on the Radiation Center

My position at the Radiation Center has been one involving long hours and lots of pressure and stress over a long period of time due to the nature of a nuclear reactor operation. The impact of the job over a 20-year period, especially the increased stress over the past two years, has had a significant impact on my health and my wife and family have prevailed upon me to retire from full-time employment on July 1, 1989.

For many years I have been arranging things so that I could retire on or after 10/1/86 when my service to the State, plus military service, equaled 30 years. I spent ten years in various management positions at the University of Washington reactor and the past 20 years in a management position at the Washington State University TRIGA reactor. I have been eligible to retire under PERS I since 10/1/86. I was considering retirement in 1988 but late in the winter of 1987 I elected to continue my employment at the Radiation Center in deference to the impact my retirement would have upon the staff of the Center (overriding my personal interests) due to the eminent possibility of decommissioning or refueling. It is now apparent that these activities will not take place for a few years beyond the time I am willing to work full-time because of health and personal considerations. Accordingly, I intend to retire from full-time employment as previously stated above at the end of June, 1989.

I will consider helping to lessen the impact of my retirement on the Radiation Center by working part-time as is permitted under the State Retirement System regulations. The maximum that I would be allowed to work is 40% (two days a week) and I would not desire to do even this for more than about a year, depending on my health. Such an arrangement should allow my replacement to be hired and qualified while still meeting all the staffing requirements of the reactor license.

WSU and the Radiation Center have one of two formidable tasks which must be completed in the near future. The fuel in the reactor must be changed from HEU to LEU fuel or, if the Administration so chooses, the facility decommissioned. Either of these options will require a very experienced and SRO licensed reactor management person in addition to the Reactor Supervisor. These operations will require a thorough understanding of the Federal regulations as well as the requirements in the facility license and will involve quality assurance considerations, safety analysis of each major operation and criticality considerations. Recently, the Federal government made changes in the regulations concerning decommissioning planning for all non-power reactors. Before July 26, 1990, WSU must submit a preliminary decommissioning plan, including: 1) a cost estimate for decommissioning, 2) a statement indicating the method by which the funds will be provided, and 3) a method of periodically adjusting the cost estimate. The government is essentially forcing all non-power reactor owners to realistically look at the costs of decommissioning and to set up a mechanism or fund to cover the cost of this possible eventuality. I recently received a cost proposal for decommissioning the WSU reactor from the Nuclear and Advanced Technology Division of Westinghouse that will enable WSU to file the required information.

Historically, the Director of the WSU Radiation Center has been an faculty member with a PhD in physical science and with a number of years experience in nuclear science research. The ANSI standard for the selection and training of personnel at research reactors does not give specific requirements for the Level 1 person or director but indicates that he should be a very experienced senior person. One of the unwritten rules in dealing with the Nuclear Regulatory Commission is that they will never, never let you decrease a specified requirement or self-imposed one once established. Thus, I am not certain how the Commission will view the permanent appointment of a director who is not a senior faculty member with a PhD and a number of years of nuclear science experience.

Another point that must be taken into consideration is that in 1969 when I came to work at the WSU reactor there were also two other nuclear engineers on the staff of the facility. Thus, the number of professionally trained nuclear engineers with extensive research reactor experience has dropped from three to one and is about to drop to zero. Obviously, this will not be acceptable to the Commission and probably will be viewed as a violation of the facility license. A professionally trained nuclear engineer with research reactor

experience thus must be hired to replace me as soon as is possible.

The problem that WSU will encounter in hiring someone to replace me is that the pool of qualified people with the requisite academic training and research reactor experience is very, very small. I doubt very much that WSU will find a qualified person to replace me who will come to work at WSU unless WSU offers that person the director's position. The number of people entering nuclear engineering programs has significantly declined in the past ten years and the demand for experienced nuclear people at nuclear power plants has risen recently. There are numerous open faculty positions in the Nuclear Engineering programs of various schools and the University of Texas has had a hard time obtaining a director for their new TRIGA reactor facility. Thus, I highly recommend that consideration be seriously given to collapsing the functions of the Director and Associate Director into one full-time position and that an appropriately qualified person be hired for the combined job. Such a person would need to be qualified and experienced in the areas of reactor physics, reactor operations and neutron activation analysis. This person would also need to obtain an SRO license for the WSU TRIGA reactor and meet the experience requirements of the ANSI standard for such positions. Also, this person should have good managerial skills and get along with the staff of the Center. The need for both a director and associate director no longer exists at the Center since the size of the operation and the number of faculty and staff at the Center has decreased by about a factor of two over the past ten years.

A nuclear reactor is not a toy but rather a very complex system and refueling the core with a new type of fuel is a complicated task. The design of a new core is not a task for reactor operators or senior reactor operators but requires an experienced nuclear engineer. The original TRIGA core was installed by General Atomics and I have redesigned the core arrangement a number of times since then, including shifting to a mixed core of Standard and FLIP fuels. Over the years I have developed a computer code system to simplify the design task. However, it takes someone experienced in nuclear reactor physics and core design at least at the MS level to operate the code and to understand its output. The seven neutron energy group two-dimensional neutronic code that is used to simulate the WSU TRIGA reactor requires 200K of memory space on the University IBM mainframe computer to run and produces a pile of output one inch thick. A new library of cross-section data will need to be added to the code for the

new LEU type fuel and calculated on a new core made with this new data. The reactor license contains a number of constraints on the reactor core related to safety that must be evaluated for each new core. The computer code significantly helps evaluate the safety-related parameters as well as predicting the performance of the core.

WEW:crc

M E M O R A N D U M

TO: Reactor Operating Staff

FROM: Roy H. Filby, Director

DATE: October 6, 1981

SUBJECT: Administrative Procedures

The management policies of the WSU Nuclear Radiation Center relating to the administration and operation of the WSU TRIGA reactor are set forth in the attached Administrative Procedures. The administrative procedures are designed to supplement the Standard Operating Procedures and are intended to clearly define the administrative requirements, responsibilities, and authority within the Reactor Operating Group.

RHF:efm

W.S.U. NUCLEAR RADIATION CENTER

Administrative Procedure

RESPONSIBILITIES AND AUTHORITY OF REACTOR OPERATING STAFF

I. Ultimate Responsibility

The ultimate responsibility for the safe operation of the WSU TRIGA Reactor located at the Radiation Center is the Licensee, which is Washington State University. The university administration delegates this responsibility through the Graduate School to the management of the Radiation Center. Changes in the management of the Radiation Center shall be reviewed by the WSU Reactor Safeguards Committee. The responsibility of the Radiation Center management shall include, but not be limited to:

1) assuring the safe operation and maintenance of the W.S.U. TRIGA Reactor and associated equipment.
2) assuring that the facility is operated in accordance with all applicable state and federal regulations as well as the facility license, and
3) assuring the enforcement of rules for the protection of personnel from excessive exposure to radiation.

The responsibility and authority delegated to the Radiation Center Management for the safe operation of the reactor is vested in the most senior licensed member of the Center Management. At the WSU Radiatior Center, this individual is the Associate Director.

II. Associate Director

The Associate Director shall be a licensed senior reactor operator, shall assist the Director in the general direction of the Nuclear Radiation Center and assume the responsibilities of the Director in his absence and shall have the following listed responsibilities and authority:

1) managing the reactor operations group and administrative group,
2) being responsible for assuring the safe operation of the W.S.U. Reactor in accordance with applicable state and federal regulations and the facility license.

3) approving all procedures and changes of procedures,

4) reviewing and approving the procurement of equipment and supplies for the operation of the reactor.

5) recommending to the Director the hiring and promotion of personnel as required,

6) functioning as the training coordinator and assuring that the proper training is conducted, that the staff is properly qualified as specified by the requalification plan, and assuring that the required training records are maintained,

7) handling all correspondence with the U.S. Nuclear Regulatory Commission,

8) maintaining a Special Nuclear Materials inventory system to meet the requirements of federal regulations and the facility license. This includes the preparation and submission of Material Status Reports and S.N.M. transfer reports,

9) approving all physical changes in or modifications to the reactor core, reactor instrumentation, or other reactor related facilities and equipment,

10) reviewing and approving the safety analysis for proposed 50.59 changes and forwarding them to the Reactor Safeguards Committee for their review,

11) taking part in the designing of experiments for the reactor to ensure that they will be operable, safe, and will not interfere with the operation of the reactor,

12) developing and submitting special plans required by state and federal regulations including 1) physical security plan, 2) reactor operator requalification plan, and 3) emergency response plan,

13) submitting renewal requests to the N.R.C. for reactor operators and senior operators, and

14) preparing applications for facility license amendments and changes to the Technical Specifications of the reactor.

III. Reactor Supervisor

The Reactor Supervisor shall be a licensed senior operator and shall have the following listed responsibilities and authority:

1) supervising all the personnel in the reactor operations group,

2) developing and maintaining operating procedures for assuring the safe operation and maintenance of the W.S.U. reactor in accordance with applicable state and federal regulations and facility administrative procedures and assuring that the applicable procedures are adhered to,

3) reviewing Health Physics surveys for adequacy and initiating additional surveillance as required,

4) maintaining and assuring facility security in accordance with the the physical security plan, including security training for staff and police,

5) assuring that R.O. and S.R.O. operational and supervisory requalification requirements are met,

6) developing and maintaining a record system on reactor operations as required by Facilities License R-76 and the facility administration procedures as listed below:

a) Reactor operating records, including power levels and periods of operation at each power level

WSU Tech Specs

(7) offsite inventories and transfers
(8) fuel inventories and transfers
(9) facility radiation and contamination surveys
(10) radiation exposures for all personnel
(11) updated, corrected, and as-built drawings of the facility

6.10 Reporting Requirements

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

(1) A report within 24 hours by telephone and telegraph to the Region V Office of Inspection and Enforcement with a copy to the Director of Reactor Licensing, of

(a) Any accidental release of radioactivity above permissible limits in unrestricted areas whether or not the release resulted in property damage, personal injury, or exposure;

(b) Any violation of the safety limit;

(c) Any reportable occurrence as defined in Section 1.1, "Reportable Occurrence," of these specifications.

(2) A report within 10 days in writing to the Director, Office of Nuclear Reactor Regulation USNRC, Washington, D.C. 20555, with a copy to the NRC Region V Office of Inspection and Enforcement, of

(a) Any accidental release or radioactivity above permissible limits in unrestricted areas whether or not the release resulted in property damage, personal injury, or exposure. The written report (and, to the extent possible, the preliminary telephone or telegraph report) shall describe, analyze, and evaluate safety implications, and outline the corrective measures taken or planned to prevent reoccurrence of the event,

(b) Any violation of a safety limit,

(c) Any reportable occurrence as defined in Section 1.1, "Reportable Occurrence," of these specifications.

(3) A report within 30 days in writing to the Director, Office of Nuclear Reactor Regulation, USNRC, Washington, D.C. 20555, with a copy to the NRC Region V Office of Inspection and Enforcement, of

(a) Any significant variation of measured values from a corresponding predicted or previously measured value of safety-connected operating characteristics occurring during operation of the reactor,

(b) Any significant change in the transient or accident analysis as described in the Safety Analysis Report,

(c) Any significant changes in facility organization,

(d) Any observed inadequacies in the implementation of administrative or procedural controls.

(4) A report within 60 days after completion of startup testing of the reactor (in writing to the Director, Office of Nuclear Reactor Regulation, USNRC, Washington, D.C. 20555) upon receipt of a new facility license or an amendment to the license authorizing an increase in reactor power level describing the measured values of the operating conditions including:

(a) An evaluation of facility performance to date in comparison with design predictions and specifications,

(b) A reassessment of the safety analysis submitted with the license application in light of measured operating characteristics when such measurements indicate that there may be substantial variance from prior analysis.

(5) An annual report within 60 days following the 30th of June of each year (in writing to the Director, Division of Licensing, USNRC, Washington, D.C. 20555) with a copy to the NRC Region V Office of Inspection and Enforcement providing the following information:

(a) A brief narrative summary of (i) operating experience (including experiments performed), (ii) changes in facility design, performance characteristics, and operating procedures related to reactor safety and occurring during the reporting period, and (iii) results of surveillance tests and inspections;

(b) Tabulation of the energy output (in megawatt-days) of the reactor, hours reactor was critical, the cumulative total energy output since initial criticality, and number of pulses greater than 1.00$;

(c) The number of emergency shutdowns and inadvertent scrams, including reasons for them;

(d) Discussion of the major maintenance operations performed during the period, including the effect, if any, on the safety of the operation of the reactor and the reasons for any corrective maintenance required;

(e) A brief description, including a summary of the safety evaluations of changes in the facility or in procedures and of tests and experiments carried out pursuant to 10 CFR 50.59;

(f) A summary of the nature and amount of radioactive effluents released or discharged to the environs beyond the effective control of the licensee as measured at or before the point of such release or discharge:

Liquid Waste (summarized on a monthly basis)

(i) radioactivity discharged during the reporting period

- total estimated quantity of radioactivity released (in curies),

6.5.2 Composition and Qualifications

The RSC shall be composed of at least five members knowledgeable in fields that relate to nuclear reactor safety. The members of the committee shall include one facility Senior Reactor Operator and WSU faculty and staff members designated to serve on the committee in accordance with the procedures specified by the WSU committee manual. The university's Radiaiton Safety Supervisor shall be an exofficio member of the committee.

6.5.3 Operation

The Reactor Safeguards Committee shall operate in accordance with a written charter, including provisions for

(1) meeting frequency: the full committee shall meet at least semiannually and a subcommittee thereof shall meet at least semiannually

(2) voting rules

(3) quorums: chairman or his designate and two members

(4) method of submission and content of presentations to the committee

(5) use of subcommittees

(6) review, approval, and dissemination of minutes

6.5.4 Reviews

The responsibilities of the RSC or designated Subcommittee thereof shall include, but is not limited to, the following:

(1) review and approval of all new experiments utilizing the reactor facility

(2) review and approval of all proposed changes to the facility license by amendment, and to the Technical Specifications

(3) review of the operation and operational records of the facility

(4) review of significant operating abnormalities or deviations from normal and expected performance of facility equipment that affect nuclear safety

(5) review and approval of all determinations of whether a proposed change, test, or experiment would consititute a change in the Technical Specifications or on unreviewed safety question as defined by 10 CFR 50

(6) review of reportable occurrences and the reports filed with the Commissions for said occurrences

(7) review and approval of all standard operating procedures and changes thereto

(8) biennial review of all standard procedures, the facility emergency plan, and the facility security plan

cc: Bill Wilson

Washington State University

Office of the Vice Provost for Research and Dean of the Graduate School
Pullman, Washington 99164-1030 / 509-335-3535

February 22, 1989

Director, Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
MS PI 137
Washington, D. C. 20555

Dear Sir:

This is to request that the application of January 30, 1989 from Washington State University to amend the Technical Specifications to Facility License No. R-76 be withdrawn. The proposed amendments did not receive the proper University administrative approval before they were submitted.

Sincerely,

W. E. Wilson

W. E. Wilson
Associate Director
Nuclear Radiation Center

Approved:

Robert V. Smith

Robert V. Smith
Vice Provost for Research and
Dean of the Graduate School

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Washington
State University

Nuclear Radiation Center, Pullman, Washington 99164-1300 / 509-335-8641

January 30, 1989

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
MS P1-137
Washington, DC 20555

Dear Sir:

Under the provisions of Section 5.90 of 10 CFR 50 and in accordance with recent changes to the federal regulations concerning decommissioning, in light of the recent facility problem with sealed sources in the reactor pool and to more specifically define the operation of the facility in relation to the organization chart contained in the facility Technical Specifications, application is hereby submitted to amend the Technical Specifications of Facility License No. R-76. The specific purposes of these changes are: 1) to ensure timely compliance to the recent changes to the regulations concerning decommissioning by the addition of new Section 6.12; 2) to preclude any future problem concerning sealed sources in the reactor pool by the addition of new Section 6.11; and, 3) to more specifically define the operation of the facility within this university administration and to replace Sections 6.1 to 6.4 and 6.5.6(1) of the Technical Specifications with appropriate wording to fulfill the requirements of 10 CFR 50.36.

The new proposed wording for Sections 6.1 to 6.4 and 6.5.6(1) of the Technical Specifications are attached. The proposed wording is to entirely replace the present wording of Sections 6.1 to 6.4 and 6.5.6(1). Additional wording to 6.8(1) is also proposed to clarify the review requirements for this specific procedure.

Sincerely,

W. E. Wilson

W.E. Wilson
Associate Director

Approved: Gary S. Collins
G.S. Collins, Chair
Reactor Safeguards Committee

JULE M. SUGARMAN
Secretary

STATE OF WASHINGTON

DEPARTMENT OF SOCIAL AND HEALTH SERVICES

Olympia, Washington 98504-0095

November 9, 1988

Robert Smith, Dean
The Graduate School
Washington State University
Pullman, Washington 99163

Dear Dean Smith:

The purpose of this letter is to confirm our telephone conversation with your Radiation Safety Officer, B. Srinivasan, on November 4, 1988, ordering Washington State University to immediately cease further manufacture and distribution of Professor Brian Lamb's atmospheric gas chromatographs, cease further receipt of sealed sources for use in the pool irradiator, and to ensure that the Tritium neutron generator will not be used for research until appropriate procedures are submitted to our office for evaluation. Dr. Srinivasan's verbal statement of intent to comply with this order is hereby acknowledged. These actions have been taken for the following reasons:

1. On February 25, 1986, the University requested permission to conduct research and development work on Professor Brian Lamb's atmospheric gas chromatograph. Authorization was granted by Leo Wainhouse of this office, with the stipulation that this office would be notified prior to any distribution, and that NRC Fuel Cycle Directive 84-22 would be followed before distributing the GC units. Contrary to the above, seven gas chromatographs have been manufactured and distributed, two of which were sent out of the country to the People's Republic of China.

2. The radioactive sources received from J. L. Shepherd & Associates for placement in your pool irradiator are of unknown construction. Although a safety evaluation was performed by Dr. Srinivasan prior to receipt of these sources, he was unable to assure us that the sources were evaluated for water immersion. Therefore, we have serious concerns for the potential contamination of the pool, the pool reactor, and the containment building. Sealed sources used in Category 3 pool irradiators must meet ANSI Standard N542-1977. Furthermore, Todd Tillinghast of Vallecitos Nuclear Center stated that the 5,000 curie GE source, serial number GEC-JCS-9147, which they encapsulated prior to delivery to you, was not evaluated for compliance with the ANSI standard.

3. Contrary to your Radiation Safety Office's agreement with us that no research work would be conducted with the Tritium neutron generator until the proper procedures had been received and approved by our office, our recent inspection of the University showed that research work had been conducted using the Tritium neutron generator.

Other items of concern from our compliance inspection of October 10-13, 1988, will be documented in a formal compliance letter to follow within the next 20 days; however, pursuant to this letter, I am requesting that the University provide the following material to me no later than the close of business, November 18, 1988:

1. An inventory of all sealed sources received from J. L. Shepherd & Associates and placed in your reactor pool, listing the manufacturer, model number, activity, and serial number, where applicable.

2. A copy of the Radiation Safety Officer's safety evaluation for all the above sealed sources.

3. A list of all the firms which received Professor Lamb's gas chromatographs, and copies of their current radioactive materials licenses.

4. Copies of all Radiation Safety Committee meeting minutes in which the manufacture and distribution of the gas chromatograph units, acquisition of sealed sources for the pool irradiator, and/or use of the Tritium neutron generator for research were discussed.

The issues we have raised in our October 10-13, 1988 inspection of your license, and in this letter concerning additional issues, are most serious, requiring an immediate followup inspection and review of radiation safety practices and the activities of the University's Radiation Safety Committee. My staff will be in touch with you regarding acceptable dates for our return visit.

If you have questions, feel free to contact me at (206) 753-3468, or Gary Robertson of my staff at (206) 753-3351.

Sincerely,

T. R. Strong, Chief
Office of Radiation Protection

TRS:kf

cc: B. Srinivasan
Radiation Safety Officer

Jack Hornor 415-943-3700
U.S. NRC, Region V

Richard McCartan
Assistant Attorney General