UNIVERSITY OF VIRGINIA
NUCLEAR REACTOR FACILITY

U.S. MAIL ADDRESS
P.O. Box 400322
Charlottesville, VA
22904-4322

STREET ADDRESS
675 Old Reservoir Road
Charlottesville, VA 22903

Telephone: 434-982-5440
Fax: 434-982-5473

March 30, 2004

Director, Division of Reactor Licensing
U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Document Control Desk
11555 Rockville Pike
Mail Stop 3H3
Rockville, MD 20852

Re: Docket No. 50-62
Docket No. 50-396

Dear Sir:

We hereby submit, as required by section 6.7.2 of the Technical Specifications, our annual report of the University of Virginia Reactor (UVAR), License No. R-66, Docket No. 50-62 and the CAVALIER Reactor, License No. R-123, Docket No. 50-396 during the period January 1, 2003 through December 31, 2003.

I declare under penalty of perjury that the foregoing is true and correct.

Sincerely,

Paul E Benneche 3-30-04

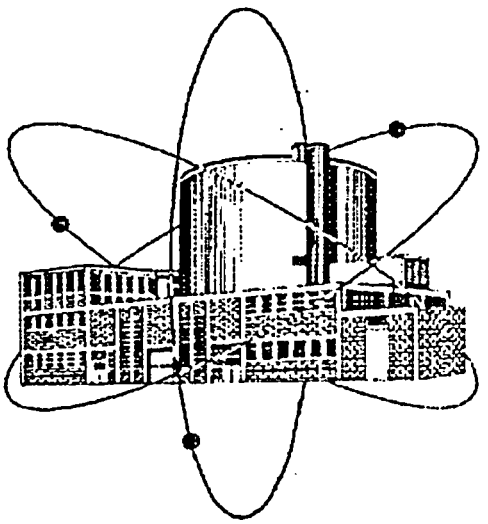
Paul E. Benneche, Reactor Supervisor
UVA Reactor Facility

cc: USNRC, Mr. Daniel Hughes

A020

UNIVERSITY
OF
VIRGINIA

REACTOR FACILITY



2003
ANNUAL REPORT

2003 ANNUAL REPORT
UNIVERSITY OF VIRGINIA REACTOR FACILITY

Table of Contents

2003 ANNUAL REPORT
University of Virginia Reactor Facility

I. REACTOR FACILITY REPORTING REQUIREMENTS

A. Reporting Period

This report on Reactor Facility activities conducted during 2003 covers the period January 1, 2003 through December 31, 2003.

B. Basis for Reporting

An annual report of reactor operations is required by the UVAR Technical Specifications, Section 6.7.2.

II. REACTOR FACILITY UTILIZATION

A. The University of Virginia Research Reactor (UVAR) was operated from June 1960 through June 1998 under license R-66 at a maximum power of two megawatts. The Administration of the University of Virginia School of Engineering and Applied Science, with the approval of the University's Board of Visitors, decided in early 1998 to permanently cease reactor operations as of July 1, 1998 and to begin the process of decommissioning the Reactor Facility. During its 38 years of operation the reactor was operated for 40,901 hours and 61,411 megawatt-hours. In preparation for decommissioning, all reactor fuel elements, both used and unused, were shipped from the facility between 1998 and 2000. In 2003 the physical decommissioning of the reactor facility was continued to completion and the final paperwork and confirmation phase was begun.

B. The second reactor at the University of Virginia, the Cooperatively Assembled Virginia Low Intensity Experimental Reactor (CAVALIER) first went into operation in October 1974, under license R-123, at a licensed maximum power of 100 watts. Reactor operations were terminated in 1988 and the reactor was unfueled after operating for a total of 1,212 hours and 3,581 watt-hours. A decommissioning plan for this reactor was submitted to the NRC in early in 1990. An order to decommission was issued by the NRC on February 3, 1992. The CAVALIER now is scheduled to be decommissioned concurrently with the UVAR. All major decommissioning activities in the CAVALIER room were completed in 2002, the final status survey was finished in 2003 and a request for license termination was submitted on April 4, 2003.

C. Since both reactors were permanently defueled they cannot again be operated. The only utilization of the reactor facility building in 2003 was for staff and faculty offices, continuing surveillance and health physics activities monitoring the shutdown facility and continuation of decommissioning work.

III. UNIVERSITY STAFF ASSIGNED TO DECOMMISSIONING ACTIVITIES

A. Reactor Staff

A NRC approved Reactor Facility organization chart is shown in Figure 1. Personnel on the reactor staff as of the end of 2003 were:

Paul E. Benneche . . . . Reactor Supervisor and Acting Reactor Director

Mr. Benneche has been employed by the University since 1977 and has served at the Reactor as Reactor Operator, Senior Reactor Operator, Research Engineer, Services Supervisor and has been Reactor Operations Supervisor since 1985. He completed both his undergraduate and master's degrees in Nuclear Engineering at UVA. He is responsible for the day-to-day operations at the facility, including decommissioning activities.

Robert Mulder, who was the University of Virginia Reactor Director from 1984 until September 2003, changed positions at the University and is now employed as a Medical Physicist in the UVA Medical Center's Department of Radiological Physics.

B. Health Physics Staff

Deborah P. Steva . . . . Reactor Health Physicist

Ms. Steva has been assigned as the UVA Reactor Health Physicist since 1989. She completed an undergraduate degree in Biology with an emphasis in Health Physics at Virginia Tech and has held several health physics related positions since graduation. She is responsible for the Health Physics program at the Reactor Facility and has oversight for all health physics aspects of decommissioning.

Other personnel from the UVA Office of Environmental Health and Safety assisted with work at the Reactor on an as needed basis.

C. Reactor Safety Committee (ReSC)

The final meeting of this committee was October 27, 2000. As per UVAR and CAVALIER Technical Specification amendments, applicable and remaining responsibilities of the ReSC were assumed by the Reactor Decommissioning Committee.

D. Reactor Decommissioning Committee (RDC)

The RDC was composed of the following individuals (as of the end of 2003):

Ralph O. Allen	Director of UVA Office of Environmental Health and Safety & Professor of Chemistry (Chair)
Paul E. Benneche . .	UVA Reactor Supervisor and Acting Reactor Director
David J. Hudson . .	Associate Vice President for Research & Public Service
Deborah P. Steva . .	Radiation Safety Specialist, UVA Office of Environmental Health and Safety

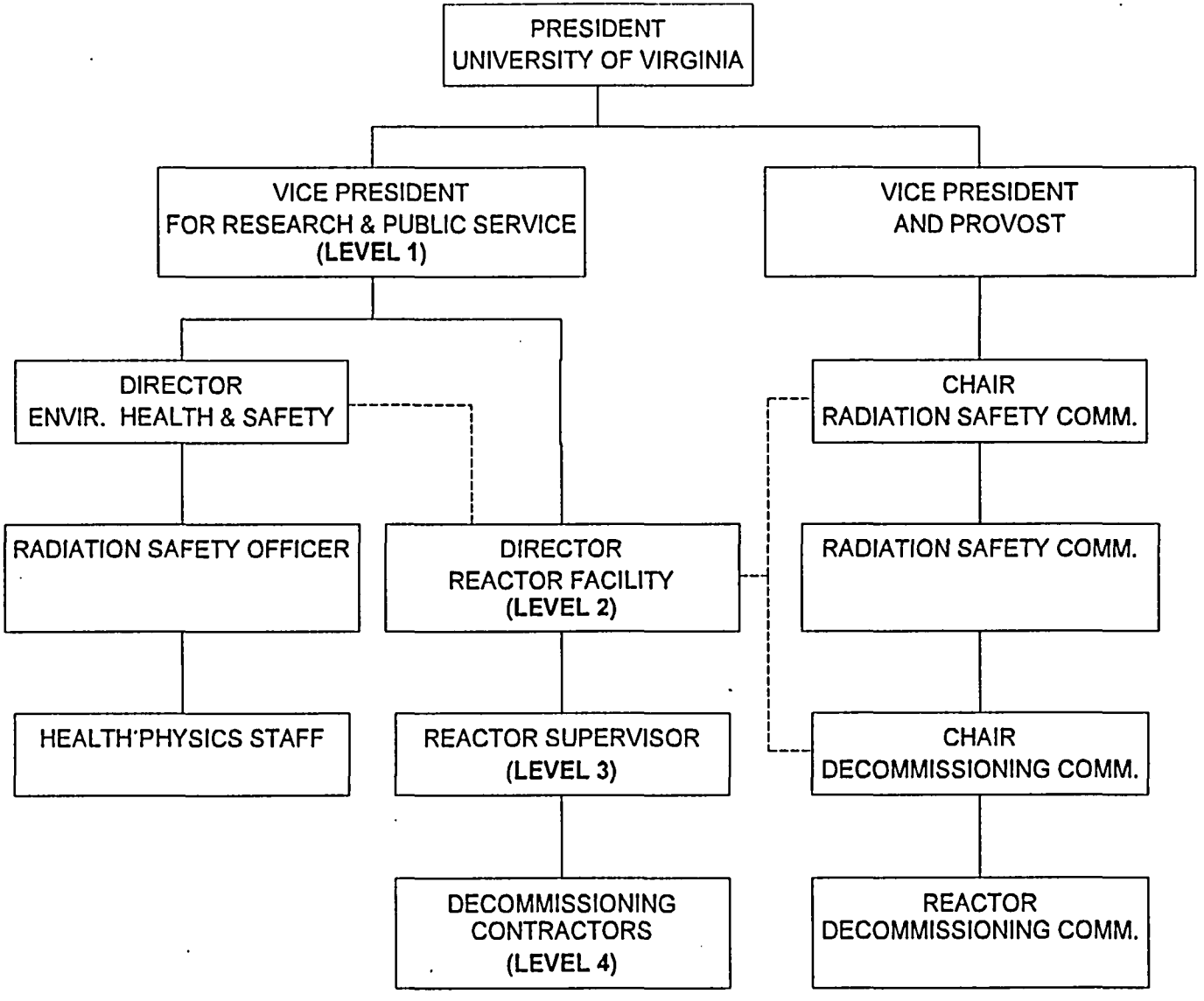


FIGURE 1
ORGANIZATIONAL CHART
UNIV. OF VIRGINIA NUCLEAR REACTOR FACILITY
(AFTER SHIPMENT OF ALL FUEL ELEMENTS OFF-SITE)

IV. TECHNICAL SPECIFICATION COMPLIANCE AND REPORTABLE EVENTS

A. During 2003 there were no identified violations of the reactor technical specifications, nor were there any identified reportable events.

V. RESULTS OF NRC INSPECTIONS AND LICENSING ACTIONS

A. During 2003 there was one NRC inspection of the University of Virginia Reactor Facility on June 11-13, 2003. This inspection included examination of instrument calibrations, dosimetry records, respiratory protection program, work permits, LLW shipment records, free-release records and environmental data. A facility walkthrough was conducted to see what was done, what has been removed, and check that this was all in accordance with the UVAR Decommissioning Plan. The NRC Inspector, Steven Holmes in the exit interview stated that he found no deficiencies and no violations.

B. During 2003, requests to change licensing documents, documents necessary to proceed with the decommissioning process, or other required documents were either submitted to, or responses about prior submittals were received back from, the NRC.

1. March 28, 2003 - Submitted 2002 Annual Report.

2. April 4, 2003 - Submitted Master Final Status Survey Plan for UVAR (R-66).

3. April 4, 2003 - Submitted Evaluation of Radiological Characterization Results Relative to Request for Termination of NRC License R-123 (CAVALIER).

4. May 20, 2003 - Submitted Continuing Characterization studies (relative to UVAR (R-66) decommissioning).

5. May 28, 2003 - Submitted personnel changes.

6. June 23, 2003 - Submitted Addenda to Master Final Status Survey Plan and Ground Water Characterization Study.

7. July 25, 2003 - Submitted Continuing Characterization studies (relative to UVAR (R-66) decommissioning)

8. December 10, 2003 - Submitted a request for approval of Final Status Survey Plan survey coverage that is consistent with MARRSIM requirements, but reduces the coverage percentages listed in the Decommissioning Plan.

9. December 12, 2003 - Request for additional information concerning Master Final Survey Plan and Addenda received from NRC.

10. Jan 22, 2004 - Submitted response to request for additional information (from D.E. Hughes, received December 12, 2003) concerning Master Final Survey Plan and Addenda.

VI. REACTOR DECOMMISSIONING COMMITTEE MEETINGS AND AUDIT FINDINGS

A. Meetings

During 2003, the Reactor Decommissioning Committee met approximately once a month, on average. Meetings are required at least quarterly.

B. Audits

The Emergency Plan and Emergency Plan Implementing Procedures were audited concurrently with their being rewritten from September 2003 to February 2004. Necessary changes and updates were made.

VII. HEALTH PHYSICS PROGRAM

During decommissioning activities, the goal of the University of Virginia's Reactor Health Physics Program continues to be protection of the health of workers and the public. UVA's radiation protection program establishes radioactive material controls that ensure the following: prevention of inadvertent radioactive material release to uncontrolled areas, assurance that personnel are not inadvertently exposed to radiation from licensed radioactive materials, and minimization of the amount of radioactive waste material generated during decommissioning. The policy of the University in general is to keep occupational doses and doses to members of the general public As Low As Reasonably Achievable.

Implementation of this goal is achieved through compliance with the reactor Decommissioning Plan (DP), reactor Technical Specifications and Standard Operating Procedures (SOPs). In accordance with the decommissioning plan, additional HP procedures were developed and approved. The UVAP Radiation Protection Plan (RPP) was developed to augment these other documents. The RPP defines the requirements for control of exposure to radiation and radioactive materials and the worker protection requirements for radiation exposure control as a part of the larger Decommissioning Health and Safety Plan. All work was performed in accordance with the reactor license, the DP and implementing procedures

A successful and effective HP project team consisting of members from the UVA, CH2M HILL, SEC and Bartlett organizations has been established and provides health physics coverage, performs radiation surveys, waste packaging, processing and shipping in support of the decommissioning effort. This team has used a variety of methods to ensure that occupational exposure to radioactive material is minimized. Methods include the use of Radiological Work Permits (RWPs), special equipment, techniques, and other practices as described in the DP. The HP organization ensures that radiation, surface radioactivity and airborne surveys are performed as required to define and document the radiological conditions for each job. Control of potential sources of radiation exposure to workers and public as a result of decommissioning activities was successfully achieved through the use of administrative, engineering and physical controls. Administrative controls included use of a facility access plan and training in areas such as radiation protection, ALARA, occupational health and safety and emergency procedures.

VIII. RADIATION EXPOSURE TO INDIVIDUALS

A. Summary

The radiation exposure of workers and the public has successfully been minimized by the implementation of the procedures and guidance included in the health physics and ALARA programs. Projected exposure for the decommissioning project is four person-rem. The collective dose for the project to date is 0.702 rem. In addition to external monitoring, internal monitoring through bioassay was performed on all permanent UVAP personnel. Baseline urine samples were collected for all permanent UVAP personnel involved in decommissioning work. Exit samples were collected when individuals' work on the project terminated. There were no positive bioassay results reported in 2003. All analysis results were less than MDC.

There were no significant exposures (greater than 500 mrem for adults and 50 mrem for persons under 18 years of age) to any individual in 2003.

B. Visitor Exposure Data For 2003

Visitors to the UVAR were monitored in accordance with requirements of the access plan, UVA HP procedures and according to the radiological hazards of areas to be entered. No measurable dose was received by any individual in any single visit.

C. Decommissioning Project Personnel Dosimetry Data For 2003

Radiation dose received by reactor facility staff and decommissioning contractors was measured using Landauer Luxel aluminum oxide dosimeters. These dosimeters measured exposure from beta, X, gamma and thermal and fast neutron radiation. All dosimeters were changed out on a monthly basis.

For all other jobs performed in 2003, worker exposure to significant external deep dose radiation fields was minimal. Exposure to radiation and contamination were controlled using administrative, engineering and physical controls. Administrative controls included daily work briefings, pre-job hazard briefs, administrative dose and ALARA limits, training, and weekly and monthly surveys. Engineering controls included the use of HEPA ventilation and enclosures for activities such as sectioning contaminated waste tanks, use of protective clothing, rad warning rope and sign postings and confinement.

Doses were maintained ALARA through active work package review and HP oversight. No doses exceeded the UVA ALARA Investigational Level 1 of 125 mrem per quarter for whole body or the UVA ALARA Investigational Level 1 of 1,250 mrem/quarter for extremities. In addition, the RPP specifies an administrative limit for UVAP radiologically controlled activities of TEDE, TODE, LDE and SDE $\leq$ 1.0 rem/yr. No doses exceeded these administrative limits. The dose distribution for personnel badged at the Reactor Facility during the period January 1, 2003 through December 31, 2003 is shown in Tables 1 and 2.

TABLE 1	
2003 Personnel Radiation Doses	
Measured Accumulated Deep Dose Equivalent* (mrem)	Number of Individuals in Dose Range
Less than 10 mrem	21
10-50 mrem	6
51-100 mrem	0
Greater than 100 mrem	0
Collective dose for this group:	0.268 rem
* Dosimeter used to measure DDE have a minimal reporting level of one mrem for gamma and x-rays, 10 mrem for beta and 20 mrem for thermal and fast neutrons	

TABLE 2	
2003 Personnel Extremity Doses	
Measured Accumulated Extremity Dose* (mrem)	Number of Individuals in Dose Range
Less than 30	4
31 - 125	0
126-500	0
Greater than 500	0
* Ring badges used to monitor extremity dose have a minimum reporting dose of 30 mrem for X and gamma-rays and 40 mrem for energetic beta particles.	

Additional self-reading dosimeters (SRDs) were worn by UVAR personnel as required by RWPs. SRD doses were recorded and tracked against the dose budgets allotted for each task. The highest recorded dose (28 mrem) occurred in February 2003 during the packaging of high activity sources for a waste shipment.

Control of personnel exposure to airborne radioactive materials was accomplished by utilizing engineering controls. When necessary, portable HEPA filter units and containment tents were used.

Monitoring for the intake of radioactive material is required by 10CFR20.1502b if the intake is likely to exceed one tenth of the annual limit on intake during the year for an adult worker or if the committed effective dose equivalent is likely to exceed 0.10 rem for the occupationally exposed minor or declared pregnant woman. During activities that created potential for airborne radioactive material, continuous air sampling was performed in the work area and lapel air samplers were placed on personnel.

Results of this air sampling confirmed that no Airborne Radioactivity Areas were created during decommissioning activities performed in 2003.

IX. ENVIRONMENTAL SURVEILLANCE

A. Environmental Dosimetry Network

Doses to members of the public from decommissioning activities have been negligible due to carefully planned decommissioning activities and site perimeter controls restricting members of the public from the area where decommissioning activities have occurred. The dose to the public during decommissioning was estimated to be less than 0.1 person-rem. The total to date as measured by SRDs issued to visitors is 0.002 person-rem.

Luxel Aluminum Oxide dosimeters are mounted at eight fixed field sites in the vicinity of the UVAR. All of the monitoring sites are outside the UVAR facility but within the area surrounding the facility that is bounded by the exclusion fence. The control locations are approximately one mile and 15 miles distant from the facility. The dosimeters are changed out and read on a quarterly basis. The annual total dose measured at each location was less than the annual dose limit to the general public of 100 mrem.

B. Air Samples

A network of environmental air samplers was established to monitor outside the facility to confirm that decommissioning activities did not result in the release of airborne radioactivity. The network consisted of four sampling locations that were identified as Site Boundary West, Northeast, Pond and 0.13 mi. East. Three of the locations were located along the UVAR site boundary and the 4th was a control location offsite. The air samplers were run continuously and air filters were changed out on a weekly basis. Air filters were analyzed for gross beta particle activity. Filters with activity above the UVAR action limit of 2.5×10^{-13} uCi/ml were recounted to determine if the activity was due only to short-lived radon daughters. All air sample analyses were below the UVAR established effluent concentration limit of 1×10^{-12} uCi/ml for gross beta particle activity with no indication of the presence of nuclides other than radon daughters. There was no significant difference between the average activity measured at the control location and average activities measured at the site boundary locations. Air sampling was discontinued on May 15, 2003, as approved by the Reactor Decommissioning Committee.

C. Water Samples

Environmental water samples were collected on a monthly basis through October 2002. On October 22, draining of the reactor pool was completed. In addition, in September 2002 the pond was drained. With all potential sources of effluent release to the pond removed, the requirement for downstream environmental sampling was deleted in November 2002.

X. RADIATION AND CONTAMINATION SURVEYS INSIDE THE REACTOR FACILITY

Surveys are considered to be an important part of the comprehensive protection program established to maintain occupational radiation exposures ALARA. Routine surveys were conducted at weekly and monthly intervals to ensure contamination and radiation levels in unrestricted areas did not exceed license, federal, state or site limits. The routine surveys were also used to assess sources of radiation or contamination exposure. HP staff

performed additional surveys whenever work activities created a potential for impact of radiological conditions.

Contamination control measures were employed to prevent the spread of radioactive material. These control measures included the use of containers and plastic bags, physical barriers such as herculite sheeting, tack mat step off pads, posting, physical area boundaries and barricades, protective clothing and ventilation devices. Consequently, the levels of contamination detected in the Facility during decommissioning activities in 2003 have remained generally very low (typically less than 50 dpm/100 cm^2).

Although not specifically required, areas of contamination greater than 50 dpm/100 cm^2 were cleaned and resurveyed. Use of good HP practices, RWPs and control barriers, etc. have contributed to successful contamination control.

By May 30, 2003 substantially all decommissioning work was completed. In accordance with the SOPs and with the approval of the Reactor Decommissioning Committee, the scope of routine surveys was reduced. Only the remaining source storage areas continued to be surveys by OEHS on a weekly basis.

XI. EFFLUENTS RELEASED TO THE ENVIRONS DURING 2003

A. Airborne Effluents

No airborne effluents were released from the facility in 2003. Control of release of airborne radioactive materials to the environment was accomplished by utilizing engineering controls. When necessary, portable HEPA filter units and containment tents were used.

B. Liquid Effluents

Liquid radioactive waste was generated from several decommissioning activities. The total volume released was 2,140 gallons and the activity released was approximately 7.34% of the release limit.

Prior to commencement of decommissioning activities involving the reactor pool, pond water released through the spillway was sampled on a quarterly basis. Upon initiation of decommissioning activities in the pool, the previous SOP for sampling and release of pond water was reinstated. Throughout 2003 the pond has remained drained with the runoff from the local environs running through the basin where the pond was located.

XII. RADIOACTIVE WASTE SHIPPED

A. Decommissioning activities during 2003 generated solid, as well as liquid low-level radioactive waste. Radioactive waste was staged in designated controlled areas in accordance with 10CFR Parts 19 and 20 requirements. This waste was handled, stored and disposed of in accordance with applicable sections of the Code of Federal Regulations, disposal site's waste acceptance criteria, Virginia Administrative Codes, UVa License and Permits and the applicable implementing plans and procedures.

Transported materials were properly classified, described, packaged, marked and labeled and were in proper condition for transport.

There were seven shipments of low level radioactive waste made from the reactor facility in 2003. On February 20, February 26, March 27, April 24, May 21, May 29 and October 17, low level radioactive waste generated from decommissioning activities was shipped to Envirocare of Utah for disposal. The volume of low level radioactive waste shipped during 2003 for disposal at Envirocare was 86.3 tons. The total activity for the seven shipments was approximately 0.474 Ci.

All waste shipments were properly manifested and transported in accordance with DOT requirements. The 10CRFR71 requirements were met through implementation of UVA approved packaging and shipping procedures.

B. Other Shipments of Radioactive Material

Five shipments of radioactive material from the Reactor Facility to another licensee were made during 2003. These shipments were made in accordance with all applicable DOT requirements. The shipments were two sealed sources returned to their manufacturer, a cask and shield shipped to North Carolina State University and a storage cask and some neutron detectors shipped to Texas A&M University.

XIII. DECOMMISSIONING FUNDING AND EXPENDITURES

A. Funding for the decommissioning of the Reactor Facilities comes from both Virginia state sources and internal private sources available to the University Administration. University officials, as well as University Staff and decommissioning contractors are committed to the safe and efficient decommissioning of the reactors within all regulatory parameters. The funds necessary to complete the decommissioning activities are available and will be committed as necessary.

B. During 2003, a total of $3,116,558 was expended on personnel, equipment and services as part of the decommissioning efforts.

XIV. CONTRACTOR COMPANIES OPERATING ON-SITE

A. The primary decommissioning contractor is CH2M HILL Constructors, Inc. Two subcontractors are working throughout the decommissioning for the main contractor, Safety and Ecology Corporation (SEC) for health physics related services and Bartlett for construction type services. Seven other subcontractors have also performed, or are performing, specific decommissioning tasks for the primary contractor. Parallax is evaluating quality assurance issues for the entire project, Envirocare is disposing of low level radioactive waste by near surface burial at its site in Utah, WMG is providing professional engineering services, Underwater Construction Contractors (UCC) provided in-pool "deconstruction" and radioactive waste handling services under the direction of WMG and CH2M HILL, Penhall is completing concrete cutting and boring, Roto-Rooter is performing visual internal examination of imbedded piping and Parham Construction has provided excavation and crane services

XV. CONTRACTED TASKS AND TIME LINES

A. CH2M HILL has been contracted to perform all the tasks necessary to fulfill the NRC approved decommissioning plans, through the free release of the Reactor Facility from both the UVAR and CAVALIER reactor licenses.

B. Decommissioning activities were begun about April 1, 2002 with the mobilization of the principal contractor and sub-contractors on site. The final status survey was completed in August 2003 (with the exception of a couple minor remediations and follow-up surveys which were done in the last quarter of 2003). A final condition report is being drafted and will be submitted to the NRC. Following the submittal of this report we will await any confirmatory surveys that the NRC chooses to have performed and (hopefully) followed shortly thereafter by the free release of the Facility.

XVI. SIGNIFICANT CHANGES TO THE REACTOR FACILITY, REACTOR SOPs AND ALL CHANGES MADE PER 10 CFR 50.59

A. Since the beginning of the primary decommissioning activities in April 2002, following the approval of the decommissioning plan by the NRC, there have been a number of significant changes to the Facility.

1. All radioactive materials stored in the UVAR reactor pool, or radioactive material in the pool that was part of the structure of the Reactor, has been removed and shipped off-site to licensed burial sites. This includes the activated parts of the reactor superstructure, the reactor gridplate, in-core and ex-core experimental facilities, graphite reflector elements, gridplate plugs, the antimony-beryllium start-up source, fuel storage racks, emergency core spray tanks and other miscellaneous structure and equipment.

2. Two used mineral irradiation facilities were shipped to Texas A&M University.

3. The reactor pool has been drained, with the pool water released to the sanitary sewer in compliance with 10CFR20.

4. The walls of the UVAR pool and the floor of the UVAR confinement room have been hydrolazed (cleaned with high pressure water) to remove the epoxy paint on these surfaces, and any radioactive contamination either on, in, or under the paint.

5. The UVAR reactor bridge, auxiliary bridge, the control room, reactor control consoles, the sample preparation & storage room, sink, storage cabinets, safe and all other items that were in the UVAR confinement have been removed. Contaminated equipment stored on the top of the rooms was size reduced and disposed of as radioactive waste. All that is left in this room is the piping and ductwork related to the room heating system and the vent and fan that comprise the room ventilation exhaust system.

6. The outside fuel transfer tank has been cut-up and disposed of as radioactive waste.

7. Three 2,250 gallon plastic waste tanks in the basement were cut up and disposed of as radioactive waste.

8. The cooling tower was dismantled and its component parts were disposed of either as scrap or surplus.

9. The demineralizer room and heat exchanger room were completely cleared of equipment, most of which was shipped off-site for burial as low level waste while non-contaminated items were either scrapped or surplussed.

10. The approximately 7,000 concrete blocks at the facility have been completely surveyed for radioactive contamination and disposed of either as surplus or as radioactive waste. Many of these blocks comprised the blockhouse around the neutron radiography facility. Other structure making up this blockhouse (steel, wood, paraffin, cadmium sheet and lead) was also removed and segregated for survey and disposal. Additionally, large concrete slabs once used for shielding were also surveyed and disposed of by the appropriate manner.

11. The CAVALIER reactor room has been cleaned out. The reactor console, concrete shielding blocks, area monitoring system and other miscellaneous equipment was removed, surveyed and disposed of as surplus. The reactor tank, subcritical assembly tank, the alternate reactivity insertion system, demineralizer system and reactor hardware was disposed of a radioactive waste. The fuel storage room adjacent to the CAVALIER room was also cleaned out to the bare walls. The small amount of radioactive material that was stored in this room was moved was removed and either disposed of as radioactive waste or transferred to other licences.

12. On January 8, 2003, Work Package 026 for Underground Storage Tank Removals was issued approved. Once uncovered, the liquid waste storage tanks (LWSTs) were opened by torch cutting a quarter section lengthwise and the contained sludge was removed. The cinder block structure enclosing the ends of the LWSTs was removed as necessary to allow the lifting of the empty tanks. The empty tanks were then lifted into a laydown area prepared in the parking lot. The HCTs were removed as individual units from the poured concrete HCT house. Following removal of the tanks, the drain lines from the reactor facility and hot cell were checked for contamination. A nominal one-foot depth of the LWST blockhouse floor was removed and placed in supersacks for shipment to Envirocare. The blockhouse drain and discharge line were removed and placed in B-25 boxes. The remainder of the enclosures were removed and staged for disposal and excavated soil was replaced. Work to excavate the two hot cell tanks (HCTs) and two liquid waste storage tanks (LWSTs) began January 9, 2003, and was completed January 24, 2003. The tanks were cut-up with torches in the appropriate enclosure and were disposed of as radioactive waste. The concrete blockhouses were size reduced and the pieces were surveyed and disposed of as appropriate.

13. The north neutron beam port was removed in segments from the reactor pool-side. Thirty inches of concrete and the beam tube was removed via diamond drill coring, plasma torch cutting and jack-hammering. A smaller section of the south beam port

and the concrete surrounding it was also removed on the pool side. All the removed material was shipped off-site as radioactive waste.

14. The knee-wall at the top of the reactor pool was removed and segmented via diamond saw cutting. Radioactive concrete was packaged and shipped as radioactive waste and clean concrete was disposed of as normal construction debris.

15. Much of the reactor related piping (mostly connected to floor drains and pool overflow drains) under the reactor room floor was surveyed and found to be contaminated. This piping was removed by gaining assess to it though the drilling of large holes in the concrete reactor room floor. This piping was disposed of as radioactive waste.

B. Changes to the Standard Operating Procedures

See section XVIII.

C. Changes Made Per 10CFR50.59

1. #2003-001, dated 4/1/03 - Retention of UVAR Reactor Room Ventilation System. The Decommissioning Plan called for the removal of the UVA reactor room ventilation system because it was thought to be radioactively contaminated based on initial surveys. Additional surveys were made that found the initial surveys were incorrect and therefore it was concluded that the system could be left in place.

2. #2003-002, dated 3/31/03 - Transfer of the area previously occupied by the CAVALIER reactor (i.e. the CAVALIER site, Room G007) to the restricted area controlled by UVAR Operating License No. R-66.

3. #2003-003, dated 5/15/03 - Remove from service the four external air monitoring stations and remove associated electrical service from the three units on the Reactor site. With substantially all decommissioning activities completed and unsealed radioactive materials having been removed from the site, the need for outside air monitoring had come to an end.

4. #2003-004, dated 6/10/03 and 7/23/03 - Change to the UVAR Decommissioning Plan. The Co-60 irradiation facility in shipping / storage cask to remain at the Reactor Facility, and not be relocated following the completion of decommissioning activities, due to better security at the Reactor Facility. This source will remain secured at the facility until it is either moved to another site at the University or is shipped for disposal.

5. #2003-005, dated 12/2/03 - Change to the UVAR Decommissioning Plan. *The University of Virginia Reactor Decommissioning Project Master Final Status Plan*, proposes establishing a minimum scanning coverage, consistent with MARSSIM, during final status surveys of 25% for Class 2 surfaces and 10% for Class 3 surfaces versus those specified in Section 4.4.3 of the Decommissioning Plan, of "100% ... Class 2 surfaces and 25% for Class 3 surfaces." This change to the decommissioning plan (to change it to the 25% and 10% values) was submitted to the NRC for approval.

XVII. LARGE EQUIPMENT TRANSFERS

Additional equipment, supplies and material was disposed of during 2003. These items were either sold as surplus, donated to other schools, disposed of as clean waste or disposed of as contaminated waste. Additional details are stated in section XVI.

XVIII. NEW AND MODIFIED SOPs HAVING RADIATION SAFETY SIGNIFICANCE

The UVAR Standard Operating Procedures (SOP) were not modified in 2003.

The health physics subcontractor, SEC, has extensive procedures governing decontamination and decommissioning operations. These were reviewed and approved for use at the UVA Reactor Facility.

XIX. EMERGENCY PREPAREDNESS

A. From September 2003 through February 2004 the Emergency Plan and Emergency Plan Implementing Procedures were in various stages of being rewritten to both update them and make them more compatible with current conditions at the Reactor Facility. This review and rewrite has now been completed and the rewritten procedures will be distributed to the emergency responders who might have need of them.

B. Because of the current conditions (only one radioactive source sealed in a shipping container and secured in a locked room) at the reactor and the minimal personnel presence in the facility it was concluded that further emergency drills would be both unnecessary and impractical. Therefore, such drills have not been included in the rewritten emergency documents.

C. The good condition of emergency supplies and equipment was verified on a quarterly basis.

D. All new employees and others working at the building were given instruction in appropriate emergency procedures.

XX. INDUSTRIAL ACCIDENTS OR INCIDENTS

A. There were no industrial accidents or incidents on the Reactor Facility site in 2003.