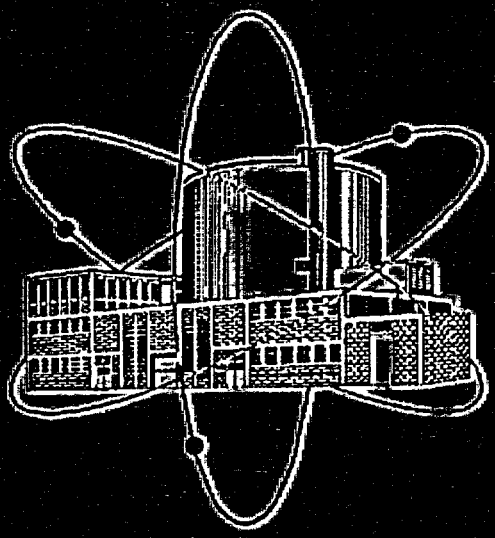
UNIVERSITY OF VIRGINIA

REACTOR FACILITY



2002 ANNUAL REPORT

UNIVERSITY
OF
VIRGINIA

REACTOR FACILITY

2002
ANNUAL REPORT

This report was compiled by the following personnel:

Sections VII - XII	-	Deborah Steva, Reactor Health Physicist
Figure 2, Section XV	-	Lark Lundberg, Principle Project Manager
All other sections	-	Paul Benneche, Reactor Supervisor

and reviewed by Reactor Decommissioning Committee on March 20, 2003

2002 ANNUAL REPORT
UNIVERSITY OF VIRGINIA REACTOR FACILITY

Table of Contents

2002 ANNUAL REPORT
University of Virginia Reactor Facility

I. REACTOR FACILITY REPORTING REQUIREMENTS

A. Reporting Period

This report on Reactor Facility activities conducted during 2002 covers the period January 1, 2002 through December 31, 2002.

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. During 2002, many major components of the UVAR decommissioning plan were begun and many of these were completed.

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 only substantial activity remaining is the final status survey.

C. Since both reactors were permanently defueled they cannot, again be operated. The only utilization of the reactor facility building in 2002 was for staff and faculty offices, a single non-reactor related research project (which moved out of the building during the year), continuing surveillance and health physics activities monitoring the shutdown facility and the beginning 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 2002 were:

Robert U. Mulder . . Reactor Director
Paul E. Benneche . . . Reactor Supervisor

Mr. Mulder has been University of Virginia Reactor Director since 1984. He also works as an Associate Professor of Nuclear Engineering. He holds a PhD in Nuclear Engineering from the University of Virginia. He has oversight and responsibility for all activities at the reactor, including the decommissioning work.

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.

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

The Reactor Safety Committee (ReSC) was composed of University faculty and staff with background and training in nuclear engineering and radiation safety. 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 at this time assumed by the Reactor Decommissioning Committee.

D. Reactor Decommissioning Committee

The Reactor Decommissioning Committee was composed of the following individuals (as of the end of 2002):

Ralph O. Allen .... Director of UVA Office of Environmental Health and Safety & Professor of Chemistry (Chair)
Robert U. Mulder .. Reactor Director & Assoc. Professor of Nuclear Engineering
Richard G. Piccolo . University Radiation Safety Officer
David J. Hudson .. Associate Vice President for Research & Public Service,

Ex-Officio
Paul E. Benneche .. UVA Reactor Supervisor
Deborah P. Steva .. Radiation Safety Specialist, UVA Office of Environmental Health and Safety

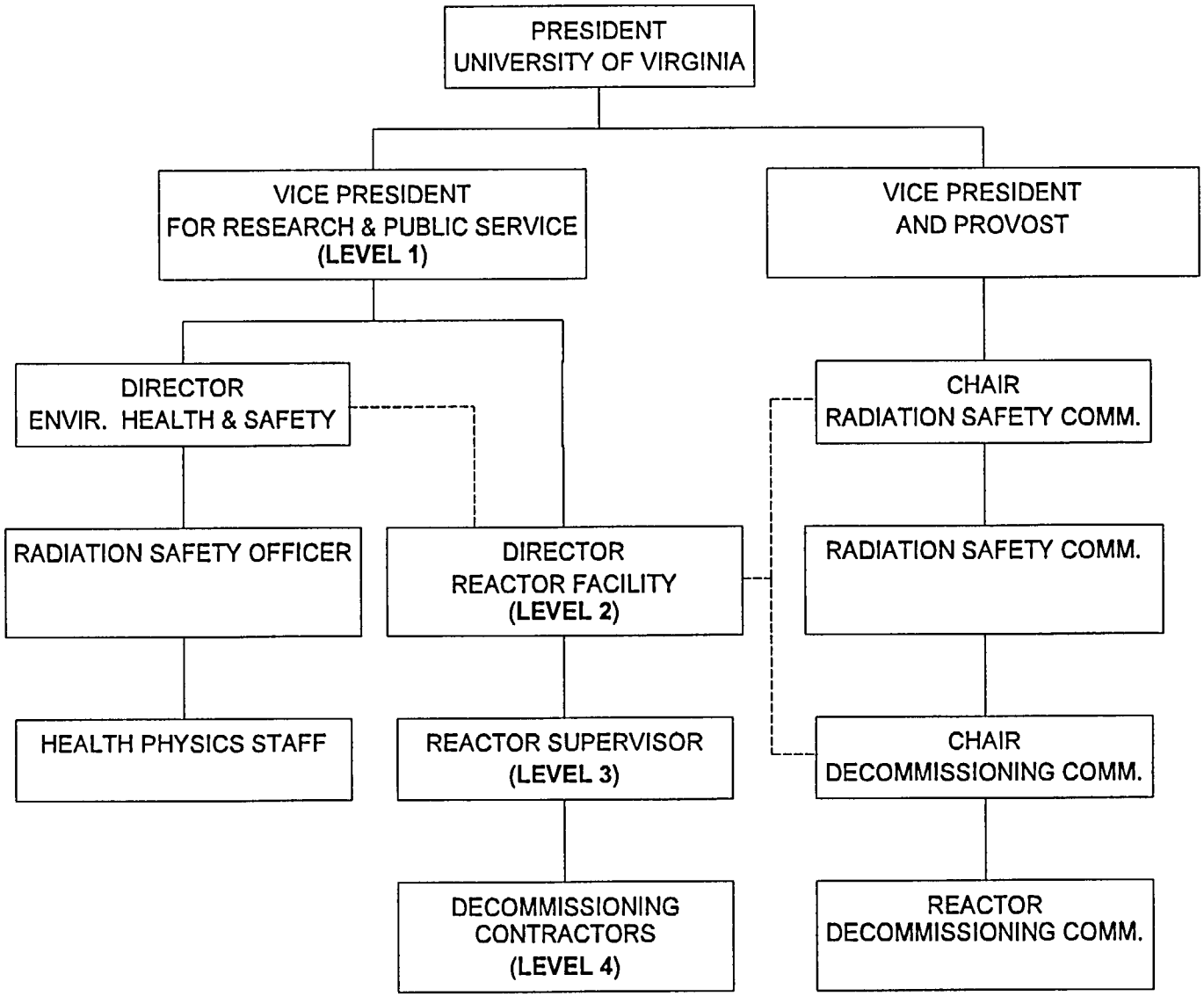


FIGURE 1
ORGANIZATIONAL CHART
UNIV. OF VIRGINIA NUCLEAR REACTOR FACILITY
(AFTER SHIPMENT OF ALL FUEL ELEMENTS OFF-SITE)

IV. TECHNICAL SPECIFICATION COMPLIANCE AND REPORTABLE EVENTS

A During 2002 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 2002 there was a single NRC inspection of the University of Virginia Reactor Facility. On June 17-18 two NRC inspectors were at the facility. No violations were identified during this inspection.

B. During 2002, several requests to change licensing documents were either submitted to, or responses about prior submittals were received back from, the NRC.

1. Approval of the decommissioning plan for the University of Virginia Reactor, licence R-66, was received March 26, 2002. This approval constituted amendment number 26 to the operating license.

2. Approval of a request to eliminate the physical security plan and reduce the possession limits for special nuclear material under both the UVAR (R-66) and CAVALIER (R-123) reactor licenses was received March 26, 2002. This approval constituted amendment number 27 to the R-66 operating license and amendment number 10 to the R-123 license.

3. Approval of a request to terminate the reactor operator requalification program was received March 14, 2002.

4. Approval of a request to renew the quality assurance program for the approval of radioactive material packages, No 0460, Docket 71-0460, was received

VI. REACTOR DECOMMISSIONING COMMITTEE MEETINGS AND AUDIT FINDINGS

A. Meetings

During 2002, the Reactor Decommissioning Committee met approximately once a month, on average. Meetings are required at least quarterly.

B. Audits

During the year, a sub-committee of the Reactor Decommissioning Committee performed an audit of the QA/QC program, experimental procedures and methods, and the reactor operator requalification program, dated March 19, 2002. A second audit, of the decommissioning activities, was also completed and was dated September 23, 2002. Neither audit uncovered any significant deficiency. The reactor staff responded to each audit. The audits and the responses are on file as part of the records of the Reactor Decommissioning Committee.

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 0.643 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 2002. 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 2002.

B. Visitor Exposure Data For 2002

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. The highest dose received by an individual in any single visit was 2 mrem.

C. Decommissioning Project Personnel Dosimetry Data For 2002

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.

During 2002 there were several decommissioning activities that represented potential for higher than normal doses. In August 2002, highly activated reactor components and experimental apparatus were segmented and placed in a shipping cask liner. The loaded liner was then moved outside to a shipping cask Initial plans called for dry loading the liner. The subcontractor hired to perform this work proposed use of divers to load the liner underwater. Careful loading of the liner to maximize shielding of the "hottest" components resulted in minimization of exposure rates on the surface of the loaded liner. Exposure rates in air measured on the loaded liner during transfer to the shipping cask were 1 R/hr on the sides and 2.3 R/hr on the bottom The dose budget for this evolution was estimated at 1,800 mrem. The actual total of DDE received was 73 mrem. This was a significant ALARA accomplishment for the project. The highest individual dose received during this operation was by the diver who loaded the liner under water The diver's dose was 45 mrem whole body and 310 mrem extremity.

For all other jobs performed in 2002, 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, 2002 through December 31, 2002 is shown in Tables 1 and 2.

TABLE 1	
2002 Personnel Radiation Doses	
Measured Accumulated Deep Dose Equivalent* (mrem)	Number of Individuals in Dose Range
Less than 10 mrem	26
10-50 mrem	12
51-100 mrem	4
Greater than 100 mrem	0
Collective dose for this group:	0 643 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	
2002 Personnel Extremity Doses	
Measured Accumulated Extremity Dose* (mrem)	Number of Individuals in Dose Range
Less than 30	1
31 - 125	4
126-500	1
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 doses occurred during removal of the most activated portion of the beamport tubes and surrounding concrete. The dose rate on the "hottest" beamport tube was approximately 500 mR/hr on contact. Collective dose received by personnel working under this RWP was 85 mrem.

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 2002. The highest level of airborne radioactivity measured was 0.0038 DAC. Total exposure for any individual was 0.05 DAC-hours. All intakes were well below 10% of the annual limit on intake.

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 4 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.

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.

Results of the analyses for samples collected through October 2002 are provided in Table 3. The average gross beta particle activity measured at each location was well below the UVAR Effluent Concentration Release Limit of 3×10^{-8} uCi/ml.

TABLE 3 Environmental Water Sample Analysis Results Gross Beta Particle Activity (x 10^{-8} µCi/ml ± 2 sigma)			
	1	2	3
January	0.1 ± 0.2	< LLD	0.1 ± 0.2
February	0.1 ± 0.2	< LLD	0.3 ± 0.3
March	1.3 ± 0.3	0.3 ± 0.2	0.5 ± 0.5
April	0.4 ± 0.2	<LLD	0.3 ± 0.3
May	Dry / no sample	<LLD	0.02 ± 0.03
June	Dry / no sample	0.03 ± 0.1	0.4 ± 0.2
July	Dry / no sample	0.2 ± 0.2	1.3 ± 0.8
August	Dry / no sample	0.3 ± 0.2	0.2 ± 0.2
September	Dry / no sample	0.7 ± 0.2	0.6 ± 0.2
October	0.8 ± 0.2	0.2 ± 0.2	0.8 ± 0.02
Avg±2 s.d.	**0.5 ± 1.0**	**0.3 ± 0.4**	**0.5 ± 0.8**

A priori LLD: 0.3 x 10^{-8} µCi/ml

1 - Upstream of on-site pond
2 - Water filtration plant, 0.26 miles southeast of Reactor
3 - Meadow Creek, near Barracks Road, 1.8 mi northeast of Reactor
(two samples collected short distance apart on creek, results are averaged)

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 2002 have remained generally very low (typically less than 50 dpm/100 cm^2).

The highest spot contamination level detected on any monthly survey was 215 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

XI. EFFLUENTS RELEASED TO THE ENVIRONS DURING 2002

A. Airborne Effluents

No airborne effluents were released from the facility in 2002. 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. In October of 2002, the remaining water in the reactor pool was sampled and released to the sanitary sewer in accordance with 10CFR20. The total volume released was 53,000 gallons and the activity released was approximately 30% of the release limit.

In October and November, 2002 the reactor room floors and reactor pool walls and floor were cleaned via hydrolazing equipment. This operation generated a significant volume of slightly contaminated wastewater. A portion of this volume of water was combined with the remaining wastewater from reactor operations held in the 2,250-gallon tank routinely used for sanitary sewer release during operations. In an effort to keep releases to the sanitary sewer ALARA, an evaporation system was installed to evaporate the majority of this water leaving the radioactive residue to be shipped as low-level radioactive waste.

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 re-instated. Due to extremely dry conditions only one pond release occurred in 2002. This release was performed in August 2002 to facilitate sediment sampling in the pond basin. Approximately 750,000 gallons of pond water were released. Results of the analysis of the water in this release showed an average Gross Beta Particle Activity (excluding Tritium) of 0.4×10^{-8} uCi/ml. This was 13% of the UVAR limit of 3.0×10^{-8} uCi/ml.

Subsequent to characterization of pond sediments in September, the pond remained drained of water with the intent to remain so until decommissioning is complete. In October of 2002, all water was removed from the reactor pool. Consequently, in November 2002 the routine sampling and release of pond water was discontinued with Reactor Decommissioning Committee approval.

XII. RADIOACTIVE WASTE SHIPPED

A. Decommissioning activities during 2002 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 was one shipment of Class C waste and three shipments of low level radioactive waste made from the reactor facility in 2002. In August, October and December, low level radioactive waste generated from decommissioning activities was shipped to Envirocare of Utah for disposal. The volume of low level radioactive waste shipped for disposal at Envirocare was 84,942 pounds. The total activity for the three shipments was approximately 32 mCi. In August 2002, activated components from the pool were packaged and shipped to Barnwell S.C. for disposal. This shipment contained approximately 56 Curies of Class C waste.

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

One shipment of radioactive material from the Reactor Facility to another licensee was made during 2002. In May 2002 the Mineral Irradiation Facility (MIF) was shipped to Texas A&M University. The activated MIF components contained approximately 16 mCi of Co-60. This shipment was made in accordance with all applicable DOT requirements.

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 2002, a total of $2,580,977 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 principle contractor and sub-contractors on site. It is now anticipated that final surveys should be completed about June 2003. After final surveys, a final condition report will be drafted and 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. The complete schedule of decommissioning activities is contained in Figure 2 (page 14).

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. The two most recently constructed and used mineral irradiation facilities were packaged and 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.

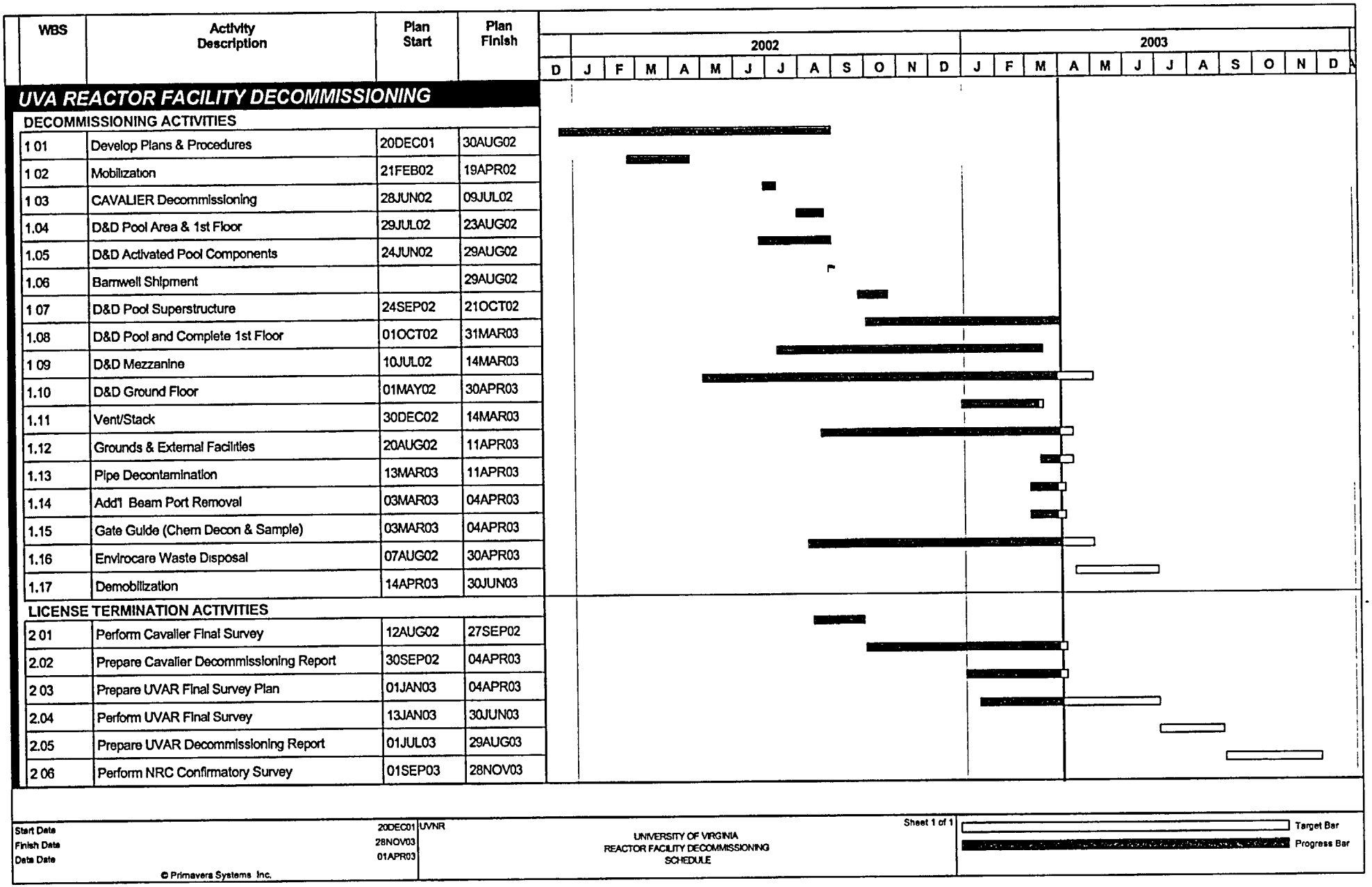


FIGURE 2
SCHEDULE OF REACTOR DECOMMISSIONING ACTIVITIES

7. Two of the 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 deminerlizer 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. Practically all of the 7,000 or so concrete blocks at the facility have been completely surveyed for radioactive contamination and either disposed of 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 as 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 to the source storage room

B. Changes to the Standard Operating Procedures

See section XVIII.

C. Changes Made Per 10CFR50.59

1. Sixteen changes were made on May 16, 2002 to the NRC approved CAVALIER Decommissioning Plan following the approval of the UVAR Decommissioning Plan and Technical Specification changes in early 2002. These changes were mostly administrative in nature and none involved changes to the physical work to be completed.

2. In order to clarify specific procedures for handling the disposition of items and materials from the Reactor Facility during decommissioning activities a definition of "decommissioning waste" was approved by the Reactor Decommissioning Committee on June 6, 2002. This term is used in UVAR Technical Specification amendment number 26 that was approved at the same time as the Decommissioning Plan. The approved definition allows for the appropriate disposition of materials

3. On July 1, 2002 the CAVALIER Decommissioning Plan, Section 2.2 was modified to reflect the use of four continuous environmental air samplers around the facility site instead of three samplers that were being used one week/month as in the original Plan.

XVII. LARGE EQUIPMENT TRANSFERS

A large quantity of equipment, supplies and material was disposed of during 2002. 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 modified with the deletion of all reactor operations related sections except one related to health physics activities (SOP 10). SOP 10 was then modified to take into account reactor pond and reactor pool drainage (pond and pool water did not require further sampling and analysis). The CAVALIER SOP was deleted in its entirety. 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. Two emergency drills were conducted during 2002, on February 13 and December 17. These drills were designed to meet the requirements of the Emergency Plan and to test emergency responders actions in realistic emergencies Description of these drills are available for review.

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

C. All new employees 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 2002.