September 2, 2005

Mr. Paul E. Benneche, Acting Director
Nuclear Reactor Facility
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

SUBJECT: NRC INSPECTION REPORT NO. 50-62/2002-202

Dear Mr. Benneche:

This refers to the Nuclear Regulatory Commission (NRC) inspection of decommissioning activities and coordination of confirmatory radiation surveys performed by our contractor, Oak Ridge Institute for Science and Education (ORISE), at the University of Virginia on October 21-23, 2002, and March 7-11, 2005, and a telephone conference on May 19, 2005. In addition, various aspects of your decommissioning and radiation protection programs were inspected, including selective examinations of procedures and representative records, interviews with personnel, and observations of the facility.

Based on the results of this inspection, it has been determined that: 1) the decommissioning of the 2 MWt University of Virginia Reactor (UVAR), License No. R-66, and the 100 watt Cooperatively Assembled Virginia Low Intensity Education Reactor (CAVALIER), License No. R-123, Docket No. 50-396 have been performed in accordance with the approved Decommissioning Plans; 2) the final status radiation surveys and associated documentation from the licensee demonstrated that residual radioactive material at the facility and site is less than the NRC-approved guideline limits; and 3) since the licensee has met their NRC-approved guideline limits, the facility and site meet the criteria for license termination set forth in 10 CFR 20.1402 in the case of UVAR, and in both 10 CFR 20.1401(b)(2) and 10 CFR 20.1402, in the case of the CAVALIER. The results of our review of your requests for license termination will be sent by separate letter in the near future.

No safety concern or noncompliance with NRC requirements was identified. No response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) http://www.nrc.gov/NRC/ADAMS/index.html.

Should you have any questions concerning this inspection, please contact Mr. Thomas Dragoun in King of Prussia, PA at 610-337-5373 or Mr. Marvin Mendonca in Rockville, MD at 301-415-1128.

Sincerely,

/RA/

Brian E. Thomas, Section Chief
Research and Test Reactors Section
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-62 and 50-396
License Nos. R-66 and R-123

Enclosure: NRC Inspection Report No. 50-62/2002-202

cc w/enclosure: Please see next page

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Docket Nos. 50-62 and 50-396
License Nos. R-66 and R-123

Enclosure: NRC Inspection Report No. 50-62/2002-202

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U. S. NUCLEAR REGULATORY COMMISSION

Docket No: 50-62

License No: R-66

Report No: 50-62/2002-202

Licensee: University of Virginia

Facility: University of Virginia Research Reactor

Location: Charlottesville, VA

Dates: October 21-23, 2002, and March 7-11, 2005

Inspectors: Thomas Dragoun
Stephen Holmes
Marvin Mendonca
Kevin Witt

Approved by: Brian E. Thomas, Section Chief
Research and Test Reactors Section
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

University of Virginia Research Reactor
Report No: 50-62/2002-202

This routine, announced inspection involved the confirmatory radiological survey and the on-site review of selected activities being performed at the site the University of Virginia Research Reactor (UVAR). In addition, the activities audited during this inspection included: organization and staffing; review and audit functions; procedures; removal of materials; decommissioning activities; release criteria; confirmatory final survey; maintenance and surveillance; and radiation protection program. The inspector was assisted by the NRC's contractor, Oak Ridge Institute for Science and Education (ORISE) Environmental Survey and Site Assessment Program.

Organization and Staffing

- The organizational structure and their corresponding functions were consistent with Technical Specification Section 6.1, and the University of Virginia Reactor Decommissioning Plan.

Review and Audit Functions

- The audits and reviews were being conducted by the Reactor Decommissioning Committee in accordance with the requirements specified in Technical Specification Section 6.2.C.3 and Decommissioning Plan Section 1.2.4.7.

Procedures

- The procedural control and implementation program was acceptably maintained and met Technical Specifications and Decommissioning Plan requirements.

Removal of Materials

- Fuel and radioactive and non-radioactive waste was removed from the site in accordance with the University of Virginia Reactor Decommissioning Plan requirements, Department of Transportation, and Nuclear Regulatory Commission regulations.

Decommissioning Activities

- Decommissioning activities were performed as required by Decommissioning Plan Section 2.3.1 and licensee procedures.

Release Criteria

- The licensee used the appropriate guideline and screening values, as required by the NRC-approved Decommissioning Plan, in performing the final survey.

Confirmatory Final Survey

- The elevated exposure readings in the basement compressor room and reactor pool floor were due to naturally occurring radioactive material.

- Based on the results of the licensee's final status survey and Nuclear Regulatory Commission's confirmatory measurements, University of Virginia has adequately demonstrated that the University of Virginia Reactor facility satisfies the radiological criteria for unrestricted use and license termination in accordance with 10 CFR 20.1402.

Maintenance and Surveillance

- The maintenance program was implemented as required by University of Virginia Research Reactor procedures.

- The licensee's program for surveillance and limiting conditions for operation confirmations satisfied Technical Specification and Decommissioning Plan requirements.

- The licensee's design change procedures were in place and were implemented as required by licensee procedures.

Radiation Protection Program

- The Radiation Protection Program being implemented by the licensee satisfied regulatory requirements.

Cooperatively Assembled Virginia Low Intensify Education Reactor (CAVALIER)

- The confirmatory survey re-affirmed the radiological status of the area previously occupied by the CAVALIER reactor as satisfying its Decommissioning Plan requirements and meets the criteria for license termination set forth in 10 CFR 20.1401(b)(2) and 10 CFR 20.1402.

Report Details

Summary of Plant Status

University of Virginia (UVA), located in Charlottesville, VA, has completed decommissioning its 2 MWt Research Reactor (UVAR) and associated systems. The reactor facility is located on the northern side of UVA's main campus. The reactor was constructed in the late 1950's to provide for training of Nuclear Engineering students and research by all Departments of Engineering and the Departments of Physics, Chemistry, Biology and Medicine. Operating under the Nuclear Regulatory Commission (NRC) License No. R-66, it went critical for the first time in June 1960. Although it was originally designed for 1 MWt output, it was upgraded to produce 2 MWt in 1971. Aluminum clad high-enriched uranium fuel was initially used and the reactor was converted to low-enriched uranium fuel in early 1994.

On June 30, 1998, all operations at the reactor ceased. UVA contracted with GTS Duratec to provide a decommissioning plan for the UVAR. A comprehensive radiological survey to characterize the UVAR was completed in September 1999. GTS Duratec provided the data and results from this survey in the report "Summary of Characterization Results" attached as an appendix to the decommissioning plan. UVA requested the NRC, by letter dated February 9, 2000, as supplemented on April 26, June 6, and December 19, 2000, and May 4 and 11, 2001, to grant the authorization to decommission the reactor according to their submitted decommissioning plan. On March 26, 2002, the NRC approved the UVAR Decommissioning Plan by license amendment. UVA contracted with CH2M HILL to decommission the UVAR facility. CH2M HILL subcontracted with Safety and Ecology Corporation (SEC) to provide overall radiological support, with Bartlett Nuclear, Inc. (Bartlett) for Decommissioning and Decontamination (D&D) services, and with WMG Inc. and Underwater Construction Corporation (UCC) to segment, remove, and dispose of activated pool components and radioactive sources. CH2M HILL started decommissioning operations in December 1999. Final waste shipment was made May 29, 2003.

The Final Status Survey Report for the UVAR facility was completed in accordance with Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) guidance and issued on June 18, 2004. According to the report, all contaminated systems and components had been removed from the site. Potentially contaminated structural surfaces identified during characterization surveys had been removed and/or remediated to assure that future facility uses do not result in radiation doses to the public in excess of 25 mrem per year.

The NRC requested Oak Ridge Institute for Science and Education's (ORISE) Environmental Survey and Site Assessment Program (ESSAP) to perform a confirmatory survey of the UVAR facility, including the CAVALIER area. On March 8-10, 2005, the ESSAP team, accompanied by NRC inspectors, conducted this survey.

3. ORGANIZATIONAL STRUCTURE AND FUNCTIONS

a. Inspection Scope (Inspection Procedure (IP) 69013)

The inspector reviewed selected aspects of:

- organization and staffing

- qualifications
- management responsibilities
- administrative controls
- decommissioning activity records
- UVAR Decommissioning Plan (DP), updated May 11, 2001
- Technical Specifications (TS), Amendment No. 27, dated March 26, 2002

b. Observations and Findings

The general organizational structure and staffing had not changed since the last inspection. The organizational structure and staffing at the facility were as reported in the Annual Report and as required by TS Section 6.1 and Figure 6.1 "B". Review of records verified that management responsibilities were administered as required by TS Sections 5.2 thru 5.6 and applicable procedures.

The decommissioning of the reactor required UVAR management to assume additional project management responsibilities. Through record reviews and interviews with the reactor manager, radiation safety officer (RSO), and Safety and Ecology Corporation (SEC) project manager, the inspector confirmed that both UVAR management and the decommissioning project organization structures were as required by DP Section 2.4 and Figure 2-4.

c. Conclusions

The organizational structure and their corresponding functions were consistent with Technical Specification Section 6.1, and the University of Virginia Reactor Decommissioning Plan.

4. REVIEW AND AUDIT FUNCTIONS

a. Inspection Scope (IP 69013)

The inspector reviewed selected aspects of:

- 2003 Reactor Decommissioning Committee (RDC) minutes
- June 2001 Health Physics (HP) Procedures and Records audit
- responses to the safety reviews and audits
- UVAR DP, updated May 11, 2001
- TS, Amendment No. 27, dated March 26, 2002

b. Observations and Findings

TS Section 6.2.C.2 and 3 states that the RDC: (1) will review and approve all changes to the Reactor Facility, TSs, Standard Operating Procedures (SOPs) and NRC-approved plans, (2) will audit the facility operations for conformance to licenses, TSs, NRC regulations, and SOPs, (3) will keep a written record of the meetings, and (4) will report directly to the Vice President and Provost of UVA.

During inspections in 2002, the inspector reviewed the qualifications of the RDC members and confirmed that they met the requirements specified in TS Section 6.2.C.1. The results of the 2002 inspections were documented in NRC Inspection Report (IR) No. 50-62/2002-201 dated May 22, 2003. The inspector noted that the RDC met more often than the required quarterly frequency and that a quorum was present each time. The inspector reviewed the minutes of the RDC and determined that they provided guidance, direction, operations oversight, and 10 CFR 50.59 request reviews as required by the DP and TS.

RDC meeting minutes and audit records showed that safety reviews and audits were conducted as required by TS Section 6.2.C.3.(4) and DP Section 1.2.4.7. The content of the audits and safety reviews were consistent with the outline provided by the TSs. These reviews provided appropriate guidance, direction, and oversight to ensure satisfactory decommissioning of the reactor.

By examining the RDC's review of the DP and their audits of the operations and training programs, the inspector determined that the safety reviews, audits, and associated findings were satisfactory and that the licensee took the appropriate corrective actions in response to the findings.

The inspector reviewed selected decommissioning and facility change approvals. Records and observations showed that changes at the facility were acceptably reviewed in accordance with 10 CFR 50.59 and applicable licensee administrative controls. None of the changes constituted an unreviewed safety question or required a change to the TS. The inspector determined that RDC reviews for 10 CFR 50.59 requests were adequately performed.

c. Conclusions

The audits and reviews were being conducted by the Reactor Decommissioning Committee in accordance with the requirements specified in Technical Specification Section 6.2.C.3 and Decommissioning Plan Section 1.2.4.7.

3. PROCEDURES

a. Inspection Scope (IP 69013)

The inspector reviewed selected aspects of:

- administrative controls
- records for changes and temporary changes
- UVAR DP, updated May 11, 2001
- TS, Amendment No. 27, dated March 26, 2002
- decommissioning procedures
- logs and records

b. Observations and Findings

During decommissioning activities, the inspector confirmed that written health physics (HP) and final survey procedures were available for those tasks and items required by TS Section 5.3, DP Section 2.3.1, and the Final Status Survey (FSS) Plan. The procedures were routinely updated and then approved by the RDC while minor modifications to the procedures were approved by the facility director.

For decommissioning of the facility, UVA incorporated selected CH2M HILL, SEC, Bartlett, and WMG/UCC procedures into their program. All such procedures were reviewed and approved by the RDC before use as required by TS Section 6.3.1.

Through review of selected training records and interviews with staff, the inspector determined that the training of staff and contractor personnel concerning procedures was adequate. During the inspector's tours of the facility, it was observed that personnel performing radiation surveys, conducting instrument checks, issuing dosimetry, and performing the decommissioning work were doing so in accordance with applicable procedures.

c. Conclusions

The procedural control and implementation program was acceptably maintained and met TS and DP requirements.

4. REMOVAL OF MATERIALS

a. Inspection Scope (IPs 69013, 86740, and 85102)

The inspector reviewed selected aspects of:

- transportation records
- disposal records
- NRC Forms 741 and 742
- UVAR DP, updated May 11, 2001

b. Observations and Findings

As noted in NRC Inspection Report No. 50-62/2001-201, all irradiated fuel was shipped off-site by June 1999, and the unirradiated fuel elements were shipped off-site on June 13, 2000. The inspector confirmed that, as noted by DP Section 1.2, all fuel had been removed from UVAR prior to decommissioning.

Ten radioactive waste shipments were made during the UVAR decommissioning. The final waste shipment occurred on May 29, 2003. One shipment was made to Barnwell, SC in August 2002. The other nine waste shipments were made to Envirocare in Utah. Six 55-gallon drums containing 3,511 pounds of radioactively-contaminated soils and asphalt, manifested for disposal at Envirocare, have been staged at UVA for future shipment. The inspector confirmed through records review,

interviews with licensee staff, and actual observation, that radioactive waste was disposed of as required by DP Section 3.2 and in accordance with Department of Transportation and NRC shipping regulations.

c. Conclusions

Fuel and radioactive and non-radioactive waste was removed from the site in accordance with the University of Virginia Reactor Decommissioning Plan requirements, and Department of Transportation and Nuclear Regulatory Commission regulations.

4. DECOMMISSIONING ACTIVITIES

a. Inspection Scope (IP 69013)

The inspector reviewed selected aspects of:

- operational logs and records
- decommissioning procedures
- decommissioning logs and records
- UVAR DP, updated May 11, 2001
- the facility during tours

b. Observations and Findings

As noted above, the reactor was permanently shut down on June 30, 1998. All reactor fuel was removed from the site with the last shipment on June 13, 2000. On March 26, 2002, following a request by the licensee and a review by the NRC, a license amendment was issued which authorized decommissioning of the UVAR. The licensee's contractor started its decommissioning of the facility in April 2002. Actual decommissioning of the facility was completed by May 29, 2003, and the contractor's final survey of the facility was finished by August 15, 2003.

Decommissioning activities focused on characterization of the UVAR, general cleanup of UVAR and adjacent controlled yard areas, and decontamination of the facility. The inspector examined the following selected tasks as directly described in DP Section 2.3.1.1.3, Decommissioning Activities and Tasks for Decontamination of the Facility:

Reactor Confinement Structure - Loose items, the reactor control room, and the instrumentation room were size-reduced as necessary and removed to the bare walls of the confinement structure. After the reactor pool had been emptied, the concrete floor was cleaned with a water jet cutting process. The floor drains were then inspected and decontaminated or removed as necessary. When all decommissioning activities that might benefit from ventilation system operation were completed, the reactor ventilation system and the building off-gas stack were surveyed. Because the indicated surface contamination was less than the Derived Concentration Guideline Levels (DCGL), the ventilation systems were left in place following review by the Reactor Decommissioning Committee.

Reactor and Pool - The water in the pool was used to provide shielding during the segmenting and removal of the highly activated components in the pool. The component segmentation process began with the placement of a shipping cask liner in the reactor pool. Segmentation was then performed underwater by divers using plasma arc cutting equipment. The liner was loaded underwater, the higher activity items were preferentially loaded nearest the center of the cask and the lower activity materiel (hardware, beam port nose pieces, etc.) loaded in the liner annulus to provide additional shielding. The water was discharged from the pool through filters to a temporary surge tank, where a second pump pumped the filtered water directly to the sanitary sewer. Using this system, the pool discharge was about 63,000 gallons; about 35 gallons remained in the piping and pool to be processed by the routine liquid release pathway. Decontamination and cleaning of the pool surfaces was accomplished with a water jet cutting process. Potential leakage paths in the pool were investigated. Concrete surface and interior core samples were evaluated for contamination or activation. The only activated concrete was detected radially around the beam tubes through the pool wall. The entire west beam port tube liner, a 30-inch diameter cylinder of concrete, was removed from the pool structure. The east beam port tube liner was removed in similar fashion to a depth of about 24 inches from the interior face of the pool. All metal in the pool that had been in direct contact with pool water was removed except for the embedded pool gate guides and structural anchor plates. Several small concrete surface contamination areas were decontaminated. The embedded flange on the heat exchanger suction, located immediately under the reactor core, was removed because it contained activation products. The remaining heat exchange and drain lines were cleaned and left in place. The “knee wall” at the top of the pool was cut off flush with the floor.

Remaining Rooms and Structures - The remaining rooms were cleared to the bare walls of their reactor-associated components and the remaining contaminated items decontaminated or disposed as low level radioactive waste. For instance, the installed laboratory counters, sinks, and hoods that had contamination levels less than the DCGL were left in place, while the potentially internally contaminated rabbit transfer system was removed completely and processed as low-level radioactive waste. Contaminated surfaces were decontaminated or removed (exhaust blowers, filters and some duct-work). The contaminated laboratory hood exhaust ducting that penetrated the wall to the outside, had contamination levels less than the DCGL and was left in place. The cooling tower on the roof of the mezzanine level was characterized before removal by a crane to the parking area. Characterization results allowed remediation of the asbestos as clean asbestos and remaining tower materials as clean construction debris. The Reactor Pool Co-60 Irradiation Facility source, previously transferred to the UVA Broad Byproduct license, has decayed to about 900 curies and is stored in the facility at this time. The hot cell lead-glass oil-filled window and manipulators were surveyed, found free from radiological contamination, and were removed for reuse by another company.

Underground Tanks and Vaults - The outdoor spent fuel transfer tank was internally contaminated from previous transfer operations. It was enclosed in a

ventilation containment to capture airborne contamination while being size-reduced by oxygen-acetylene torch cutting. The sand base for the tank was removed and processed as low-level waste. Two large underground liquid waste tanks and two smaller hot cell drain tanks were excavated, removed, and size-reduced for disposal as low-level waste. Some of their associated buried piping was removed as part of the removal operation of the tanks and enclosures. The remaining underground pipe sections were surveyed, found to be free from contamination, and were left in place. The block wall and gravel floor of the liquid waste tank blockhouse were found to be contaminated, and were removed and processed as low-level radioactive waste. The poured-concrete hot-cell tank vault was removed, surveyed, and found to be free from radiological contamination, allowing disposal as construction debris. The blockhouse and the vault structures were removed completely to bare soil.

Outdoor Areas, Drains & Sewers - Storm drains, building drains, and the sanitary sewer line were surveyed and confirmed to be clean or to have radioactive contamination levels less than the DCGL. Initial characterization efforts had identified previously contaminated surface soil adjacent to the liquid waste storage tank blockhouse. These soils and the pond sediments were re-characterized and found to not require remediation. The only "soil" remediation required was performed when the underground liquid waste storage tanks blockhouse floors were removed. The other outdoor area remediated was the asphalt pad just outside the reactor room roll-up door.

During the inspections in 2002, the inspector observed various of these activities as they were being conducted including: piping and instrumentation, upper top shield, graphite removal, lead thermal shield, fission chambers, and activated concrete. In order to verify that all the above tasks had been performed in accordance with the DP, the inspector also reviewed the related licensee and contractor records and surveys, and toured the facility. The inspector determined that the above tasks had been completed in accordance with final approved DP.

c. Conclusions

The licensee used the appropriate guideline and screening values, as required by the NRC-approved Decommissioning Plan, in performing the remediation of the facility.

5. RELEASE CRITERIA

a. Inspection Scope (IP 69013)

The inspector reviewed selected aspects of the following documents and records to determine if the Final Status Survey was conducted in accordance with MARSSIM recommendations, that the appropriate limits were applied to residual radioactivity, and all survey units met the criteria for unconditional release:

- UVA DP, updated May 11, 2001

- UVA Decommissioning Plan Appendix A “Summary of Characterization Results,” issued February 2000
- UVA Letter to NRC, “Request for Approval of Final Status Survey Plan coverage consistent with MARSSIM requirements for the University of Virginia Reactor (License R-66)” dated December 5, 2003
- Final Status Survey Report for the UVA Facility Decommissioning Project Revision 1, dated November 2004
- NUREG - 1575, “Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)” final version dated December 1997
- NUREG/CR-5512, “Residual Radioactive Contamination From Decommissioning” Draft report for comment dated October 1999
- NUREG-1757, “Consolidated NMSS Decommissioning Guidance”, Final Report dated September 2003
- NRC Letter, D. Hughes, NRC Project Manager to P. Benneche, Director, “Subject: University of Virginia - Master Final Status Survey Plan and Addenda 001-008” dated December 12, 2003
- UVA Letter, P. Benneche to D. Hughes, NRC, “Subject: University of Virginia - Master Final Status Survey Plan and Addenda 001-008” dated January 22, 2004
- NRC Letter, D. Hughes, NRC Project Manager to P. Benneche, Acting Director, “Subject: Request for Additional Information Concerning University of Virginia Final Status Survey Report, License No. R-66” dated September 7, 2004
- UVA Letter, P. Benneche to D.Hughes, NRC, “Subject: University of Virginia Response to Request for Additional Information Concerning the University of Virginia Final Status Survey Report, License No. R-66” dated December 9, 2004
  - Attachment to above, “Response to ORISE Comments Regarding the Final Status Survey Report for the University of Virginia Reactor Facility Decommissioning Project” Revision 1, dated November 2004
  - Attachment to above, “Document Change Outline for Final Status Survey Report, University of Virginia, November 23, 2004”
  - Attachment to above, “Explanation of Significant Technical Changes for Final Survey Status Report, University of Virginia”, Revision 1, November 2004
  - Attachment to above, “Final Status Survey Report - Evaluation of Radiological Results Relative to Termination of NRC License R-66, University of Virginia, Charlottesville, Virginia”, Revision 1, November 2004
  - Attachment to above, “Instrument Set 11" Revision 1, November 2004
- UVA Letter, P. Benneche to D. Hughes, NRC, “University of Virginia License Termination Request and Transmittal of the University of Virginia Decommissioning Plan Performance Summary”, April 2004, and the “Final Status Survey Report - Evaluation of Radiological Results Relative to Termination of NRC License R-66, University of Virginia, Charlottesville, Virginia, May 2004” dated June 18, 2004
- NRC Letter, A. Adams, NRC Senior Project Manager, to R. Mulder, Director - Nuclear Reactor Facility, “University of Virginia Research Reactor - Environmetal Assessment Re: Amendment for Approval of Decommissioning” dated November 27, 2001
- UVA Letter, P. Benneche, Reactor Director, to D. Hughes, NRC Project Manager, “Request for Approval of Final Status Survey Plan coverage consistent with MARSSIM requirements for the University of Virginia Reactor (license R-66)” dated December 5, 2003

- NRC Letter, D. Hughes, NRC Project Manager to P. Benneche, Director-Nuclear Reactor Facility, "Approval of Final Status Survey Plan Coverage Change for License No. R-66 - University of Virginia" dated March 31, 2004
- UVA Letter, Professors G. Hornberger and J. Raffensperger, Department of Environmental Sciences, to R. Mulder, Director Reactor Facilities, dated December 20, 1995
- UVA Report, Office of Environmental Health and Safety to R. Mulder, Director Reactor Facilities dated October 24, 1997
- UVA Master Final Status Survey Plan, UVA-FS-002, Revision 1, April 2004
- UVA Letter, P. Benneche, Reactor Director, to D. Hughes, NRC Project Manager, "'Official' response to questions received in an email of May 18, 2005 from D. Hughes (USNRC) to Paul Benneche (UVA), which were subsequently discussed in a conference call on May 19, 2005....." dated June 30, 2005

b. Observations and Findings

A review of historical records and radiation surveys was performed by a contractor (GTS Duratek) in accordance with MARSSIM to obtain the information needed to characterize the radiological status of the facility. This effort was completed in September 1999. The data from this report was used to establish the boundaries of survey units and to assign a classification. Survey units must have the same radiological conditions throughout the area. Table 3-1 in the DPlan lists the survey areas and classification of each for the interior building surfaces and exterior soil impacted by reactor operations.

Two members of UV Environmental Sciences faculty stated in a 1995 letter to the Reactor Facility Director that they believed that a water leak from the building had contaminated the nearby soil and pond areas. The UV Office of Environmental Health and Safety investigated this matter and issued a report dated October 24, 1997. The report concluded that "...there is no evidence that water reportedly released from the reactor pool through leakage has impacted the ground water quality downgradient of the reactor building." This issue occurred again during the confirmatory survey as a result of elevated readings obtained by ORISE during the survey of the reactor pool floor. The different measurements were determined to be the result of deposits of natural occurring radionuclides that varied significantly in the north-south direction beneath the pool floor.

The characterization data indicated that, with the exception of laboratories M005 and M008, the isotopic mix of contaminants of concern for the UVAR were beta-gamma emitters—fission and activation products—present as a result of reactor operation. The two laboratories that were the exceptions contained surface contamination that included Tc-99 and Ni-63. Since the preponderance of radioactive material consisted of radionuclides commonly found at reactor sites, the licensee adopted NRC's published guidance for acceptable license termination screening values for common radionuclides found in soil and in building surface contamination (see Federal Register Notices: 63 FR 64132, November 18, 1998 and 64 FR 68395, December 7, 1999). Since the contamination was a mix of radionuclides, the licensee selected Cs-137 as the easy-to-detect surrogate for the final status surveys and calculated a specific gross activity DCGL using the NRC screening values for the radionuclides present.

This took into account the radionuclide mix as well as corrections for hard to detect isotopes. The use of the NRC screening values also eliminates the need for ALARA analysis but does not allow use of area factors to deal with elevated readings found during the survey (see NUREG-1727, "NMSS Decommissioning Standard Review Plan," Appendix D, September 2000). The screening values were based on conservative calculations and assumptions such that no further reductions were required. Similarly, NRC screening values for building surface contamination were available and adopted by UVA. Using the sum of fractions, the licensee calculated the DCGL for the surrogate and applied it to the radiological survey data to determine if the unit met the release criteria. The release criteria are specified in Section 4.3 of the NRC-approved Decommissioning Plan. In a May 4, 2001, letter to the NRC, the licensee stated that UVA will use Method 1 from Section 14 of NUREG-1727 for the final status surveys. Under this method, the design of the final status surveys (Section 14.4) and the final status survey report (Section 14.5) are submitted after completion of the surveys rather than with submission of the decommissioning plan for approval.

Ni-63 was used as the surrogate in laboratories M005 and M008 in lieu of Cs-137 due to the unique mix of radionuclides. For certain soil areas, Co-60 was used as the surrogate when Cs-137 was not detectable. In a December 9, 2004 letter, the licensee indicated that the level of hard-to-detect radionuclides in survey samples from the four soil areas contributed less than 10% of the total dose from residual activity. In addition, the concentration of hard-to-detect radionuclides was usually below the minimum detectability so that assumed radionuclide mix could not be guaranteed. This was not a concern due to the small contribution to the total dose associated with these isotopes.

The inspector compared data for selected survey units and MARSSIM classification in table 3-1 with the characterization results and the requirements in the Decommissioning Plan. At NRC request, ORISE staff reviewed the Final Status Survey data and selected UVA responses to various issues and discussions regarding the data. The NRC inspector as well as the ORISE staff concluded that the FSS Report documents that the site meets the radiological criteria for release for unrestricted as specified in 10 CFR 20.1402.

The inspector observed and interviewed Duratec's representative who was conducting the characterization of the site. The inspector determined that Duratec used the appropriate guidelines and screening values in the Characterization Report for each survey unit as specified in the DPlan.

c. Conclusions

The appropriate screening values for residual contamination were applied to the survey unit data during the Final Status Survey. All survey units were below the screening value.

6. CONFIRMATORY FINAL SURVEY

a. Inspection Scope (IP 69013)

The inspector reviewed selected aspects of:

- UVAR DP, updated May 11, 2001
- UVAR Decommissioning Plan Appendix A "Summary of Characterization Results," issued February 2000
- Final Status Survey Report for the UVAR Facility Decommissioning Project issued November 2004
- ORISE Report, "Revised Final Report - Confirmatory Survey of the University of Virginia Reactor, University of Virginia, Charlottesville, Virginia [Docket No. 50-62; Task No. 2.10" dated August 23, 2005. Survey conducted March 8-10, 2005

b. Observations and Findings

(1) Overview

DP Section 4.0, "Proposed Final Radiation Survey Plan," describes the final radiation survey to be conducted of the facility prior to license termination. As stated in the DP, "The purpose of the Final Radiation Survey is to demonstrate that the radiological condition of the UVAR site structures are at or below established release criteria in anticipation of NRC approval to terminate the UVAR Reactor licenses and to release the facility housing the UVAR for unrestricted use."

The licensee is responsible for documenting the completion of decommissioning and performing a final status survey (Final Status Survey Report for the UVAR facility issued November, 2004), the NRC verifies the licensee's performance through inspections during decommissioning activity and a confirmatory final status survey at the end.

As part of this confirmatory process ESSAP reviewed and evaluated UVA's final status survey plan and report. The documents were reviewed for general thoroughness, accuracy, and consistency. Data were evaluated to assure that areas exceeding guidelines were identified and had undergone remediation. Final status survey results were compared with guidelines to ensure that the data had been interpreted correctly. Comments were provided to the NRC documenting the review of the final survey plan and the final survey report.

The procedures, methods, and data submitted by UVA were considered to be appropriate and adequately documented the radiological status of the UVAR. ESSAP confirmed that the licensee modified the gross activity guidelines to account for hard-to-detect radionuclides. However, the total contribution of these radionuclides to the annual dose was less that 10%. This data was reviewed by ESSAP to evaluate its appropriateness of use and determined it to be satisfactory.

ESSAP performed confirmatory surveys of the UVAR during the period March 7 to 11, 2005. The Final Report was issued on July 12, 2005. The surveys were performed in accordance with the site-specific survey plan submitted to and reviewed by the NRC and the ORISE/ESSAP Survey Procedures and Quality Assurance Manuals. ESSAP surveys, their individual findings, and overall results are described in the sections following.

(2) Surface Scans

Surface scans for beta and gamma radiation were performed over approximately 100% of the floor surfaces in the Reactor Confinement Room, Reactor Pool, Health Physics Lab, Hot Lab, Demineralizer Room, Rabbit Room, and the CAVALIER facility. Surface scans for beta and gamma radiation were performed over approximately 25% to 50% of the lower walls in these areas. Upper walls and ceilings in the Reactor Pool and HP Lab were scanned over approximately 5% to 10% of the surfaces.

Particular attention was given to remediated and adjacent surfaces, cracks and joints in the floors and walls, and other locations where residual radioactive material may have accumulated. Scans were performed using gas proportional and NaI scintillation detectors coupled to ratemeters or ratemeter-scalers with audible indicators. Locations of elevated direct radiation were noted for further investigation.

ESSAP identified a few areas of elevated beta surface radiation and elevated gamma radiation, particularly in the reactor pool floor. Further investigation determined that the cause of elevated readings was the naturally occurring radionuclide deposits beneath the pool floor. These deposits also showed a steep gradient in the north-south direction. This was resolved by additional survey data with radionuclide identification.

Surface scans of outdoor locations including the prior location of the underground waste tanks, reactor pond soil area, paved areas, and gravel surfaces were performed over approximately 25% to 100% of the accessible areas using a sodium iodide scintillation detector coupled to a ratemeter.

Gamma surface scans were within the range of ambient background levels.

(3) Surface Activity Measurements

The licensee did not pursue a material-specific background. Instead, the licensee took open-window/closed-window measurements to determine the gamma background at each location. These background measurements were used to correct gross beta surface activity measurements.

Direct measurements for total beta activity were performed at 60 locations, chosen randomly and based on surface scan results. Dry smears were collected at each direct measurement location for determining removable gross alpha and gross

beta activity. Direct measurements were performed using gas proportional detectors coupled to ratemeter-scalers.

(4) Sampling

ESSAP collected surface soil in increments of 15 cm to a depth of 30 cm at judgmental locations beneath the floor of the Reactor Confinement Room (Room 131) and reactor pool floor. In addition, surface soil (0-15 cm) and subsurface soil (15 cm to 45 cm) samples were collected at judgmental locations from the reactor pond. ESSAP analyzed five split samples taken by UVA at the request of NRC on January 21, 2003, from the waste tank excavation and kept in storage. These samples were not afforded the complete level of control required by MARSSIM but were stored with the facility and security seals were intact.

(5) ESSAP Results

All ESSAP confirmatory activity measurements, including the identified elevated areas, met guidelines and did not require further remediation. Confirmatory activities included document and data reviews, and during the period of March 8 to 10, 2005, independent surface scans, surface activity measurements, and soil sampling.

The findings of the confirmatory survey support UVA's final survey results for building surfaces and soil areas, and in ESSAP's opinion, indicate that the radiological conditions of the surveyed areas satisfy the NRC guideline for release without radiological restrictions.

c. Conclusions

Based on the above observations, surveys, evaluations, and analyses, the inspector concluded that the licensee's final status survey and ESSAP's confirmatory measurements has adequately demonstrated that the UVAR facility satisfies the criteria for release for unrestricted use in accordance with 10 CFR 20.1402. That criteria is that a site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a TEDE to an average member of the critical group that does not exceed 25 mrem (0.25 mSv) per year, including that from groundwater sources of drinking water, and the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA).

8. MAINTENANCE AND SURVEILLANCE

a. Inspection Scope (IP 40755)

The inspector reviewed selected aspects of:

- maintenance procedures
- equipment maintenance records
- surveillance and calibration procedures

- surveillance, calibration, and test data sheets and records
- reactor periodic checks, tests, verification, and decommissioning activities
- facility design and DP changes and records
- NNRC Procedure 4200, "10 CFR 50.59 Review Program for Changes and Tests During Decommissioning," Revision 01, dated November 1, 1999
- TS, Amendment No. 14, dated July 22, 1999

b. Observations and Findings

(1) General Maintenance

During decommissioning general maintenance was focused on the support services and equipment and not on any reactor systems. The inspector reviewed maintenance records, interviewed staff and observed minor maintenance performed on the various systems in operation. Based on the inspector's interviews and observations, general maintenance was acceptable for an industrial site.

(2) Surveillance

The inspector reviewed records of the TS Section 3 required surveillance verifications performed during 2000. The results of the surveillances for the radiation monitoring system and the ventilation system were within prescribed TS limits and procedure parameters, and in close agreement with the previous surveillance results.

(3) Change Control

TS or DP related 10 CFR 50.59 changes required review by the TSRC in accordance with TS Section 5.2.

The inspector reviewed various TSRC approved change packages for changing the method of accomplishing certain decommissioning activities. The inspector determined that the changes had been evaluated, reviewed, and approved as required by NNRC Procedure 4200, "10 CFR 50.59 Review Program for Changes and Tests During Decommissioning," Revision 01, dated November 1, 1999. The reviews were technically complete and adequately documented. Additionally, the inspector concluded that TSRC 10 CFR 50.59 reviews and approvals were focused on safety, and met licensee program requirements.

c. Conclusions

The licensee's program for surveillance and limiting conditions for operation verification satisfied TS and DP requirements. The licensee's maintenance and design change programs were in place and were being implemented as required by licensee procedures.

9. RADIATION PROTECTION

a. Inspection Scope (IPs 69001 and 40755)

The inspector reviewed selected aspects of the radiation protection program (RPP):

- Radiation Protection Training
- radiological signs and posting
- facility and equipment during tours
- routine surveys and monitoring
- survey and monitoring procedures
- dosimetry records
- maintenance and calibration of radiation monitoring equipment
- periodic checks, quality control, and test source certification records
- NNRC Radiation Protection Program (RPP)
- event/incident records

b. Observations and Findings

(1) Radiation Protection Program

Although individual procedures had been revised and some added, the RPP had not functionally changed since the last inspection. The licensee reviewed the RPP at least annually in accordance with 10 CFR 20.1101(c). This review and oversight was provided by the TSRC as required by TS Section 5.2.d(9) and DP Section 2.4.3.

The inspector's review of procedure change records, revisions, and radiation work permits (RWP), confirmed that the RSO, individually and as a TSRC member, reviewed and approved RWPs, and advised the Director and TSRC on matters regarding radiological safety as required by TS Section 5.1.b, DP Section 2.4.1, and the RPP.

Through record reviews and interviews with GTRR and Duratec staffs, the inspector confirmed that the RPP was applied to all activities during the decommissioning project, as required by DP Section 3.1 and GTRR procedures.

(2) Radiation Protection Postings

The inspector observed that caution signs, postings and controls to radiation and contaminated areas at the NNRC were acceptable for the hazards involved and were implemented as required by 10 CFR 20, Subpart J. The inspector observed licensee and contractor personnel and verified that they complied with the indicated precautions for access to such areas. The inspector confirmed that current copies of NRC Form-3 and notices to workers were posted in appropriate areas in the facility as required by 10 CFR 19.11.

(3) Radiation Protection Surveys

The inspector audited the GTRR daily, monthly, quarterly, and other periodic contamination and radiation surveys, including airborne activity sampling, performed from 2000 to 2003. The surveys were performed and documented as required by DP Section 3.0, and GTRR survey procedures. HP surveys required for special decommissioning activities, such as RWPs, were also performed and documented as required. Results were evaluated and corrective actions taken and documented when readings/results exceeded set action levels.

(4) Dosimetry

The inspector confirmed that dosimetry was issued to staff, contractors, and visitors as outlined in licensee procedures. The licensee's dosimetry issuing criteria specified that dosimetry should be issued to individuals who might receive a dose equivalent exceeding 10% of the annual limits specified in 10 CFR 20.1201(a). This criteria meet the requirements of 10 CFR 20.1502 for individual monitoring. Training records showed that personnel were acceptably trained in radiation protection practices. During the inspection the inspector observed that workers and staff wore their dosimetry as required.

The licensee used a National Voluntary Laboratory Accreditation Program-accredited vendor to process personnel thermoluminescent dosimetry. Dosimetry results were reviewed by the RSO and doses above the facility's ALARA limits were investigated as required. The inspector's review of the licensee's radiological exposure records from 2000 to 2003 verified that occupational doses were within 10 CFR Part 20 limitations.

(5) Radiation Monitoring Equipment

The calibration and periodic checks of the licensee's and contractor-owned portable survey meters, radiation monitoring, air sampling, and counting lab instruments were performed by facility staff or by certified contractors. The inspector confirmed that the licensee and contractor calibration procedures and annual, quarterly, semiannual and monthly calibration, test, and check frequencies satisfied TS Section 4.3.3, DP Section 3.1, and 10 CFR 20.1501(b) requirements, as well as guidance in the American National Standards Institute N323 "Radiation Protection Instrumentation Test and Calibration" or the instruments' manufacturers' recommendations. The inspector verified that the calibration and check sources used were traceable to the National Institute of Standards and Technology and that the sources' geometry and energies matched those used in actual detection/analyses.

The inspector reviewed the calibration lists and confirmed that calibrations for the radiation monitoring and counting lab equipment currently in use had been performed and that all portable instruments in use were calibrated.

All instruments checked by the inspector had current calibrations appropriate for the types and energies of radiation they were used to detect and/or measure.

(6) Respiratory Protection

DP Section 3.1.6 states that the Respiratory Protection Program will be implemented by the decommissioning contractor in compliance with ANSI Z-88.2, US NRC Regulatory Guide 8.15, 10 CFR 20.1701 through 20.1704, and OSHA requirements.

While conducting inspections during decommissioning activities at the facility, the inspector reviewed the respiratory protection program in use by contractor personnel. The inspector noted that the licensee and contractor had established a respiratory protection program as required by DP Section 3.1.6 and were using tested and certified NIOSH/MSHA equipment as required. Records and observation showed that air sampling was being conducted, surveys and bioassays were completed as required, testing of respirators was being done, fit testing of individuals was performed, and individuals were required to pass a physical in order to qualify to use a respirator. The respiratory protection program was in compliance with 10 CFR 20.1703 and the DP.

(7) Effluents

The program for the monitoring and storage of radioactive liquid, gases, and solids was acceptable. Radioactive effluents were monitored and released when within established limits as outlined in licensee procedures and the regulations. The principles of As Low As Reasonably Achievable (ALARA) were acceptably implemented to minimize radioactive releases. Monitoring equipment was maintained and calibrated as required. Records were current and acceptably maintained.

c. Conclusions

Based on the observations made and records audited, it was determined that, because: 1) surveys were completed and documented as required by 10 CFR 20.1501(a) and licensee procedures, 2) postings met regulatory requirements, 3) the personnel dosimetry program was acceptably implemented and doses were in conformance with licensee and 10 CFR Part 20 limits, 4) portable survey meters, radiation monitoring, and counting lab instruments were maintained and calibrated as required, 5) the evaluation and administration of the respiratory program were adequately performed, and 6) the program for monitoring, storage, and release of effluents was acceptable, the RPP implemented by the licensee satisfied NRC and DP requirements.

10. CAVALIER Reactor

a. Inspection Scope (IP 69013)

The inspector reviewed records regarding the remediation and release of the area occupied by the CAVALIER reactor as follows:

- Letter from R. Mulder, Director, UVA Reactor Facility, to NRC, "Subject: Application for Termination of License with the Submittal of a Decommissioning Plan for the University CAVALIER 100 watt Reactor (NRC Docket 50-396, License No. R-123
- Letter to A. Adams, NRC, from R. Mulder, University of Virginia,"Subject: UVA's Response to NRC Request for Additional Information Pertaining to the CAVALIER Decommissioning plan
- Letter to R. Mulder, UVA, from A. Adams, NRC, "Subject: Order Authorizing Dismantling of Facility and Disposition of Component Parts - University of Virginia CAVALIER Research Reactor", dated February 3, 1992
- Contractor (CH2MHILL and SEC) report, "Evaluation of Radiological Characterization Results Relative to Termination of NRC License R-123" dated March 2003
- NRC Regulatory Guide 1.86, Termination of Operating Licenses for Nuclear Reactors, June 1974
- Draft NUREG/CR-5849, "Manual for Conducting Radiological Surveys in Support of License Termination", June 1992
- University of Virginia Decommissioning Project Final Status Survey Report dated June 2004

b. Observations and Findings

The licensee submitted an application for the termination of the CAVALIER reactor license and proposed a decommissioning plan in a letter to NRC dated February 26, 1990. After a review of the information submitted, the NRC issued an Order in February 1992, directing the licensee to proceed with the dismantling of the facility and disposition of the component parts. The decommissioning occurred over the next few years. A site characterization survey to identify the remaining types and quantity of radionuclides in the facility was performed by a contractor (GTS Duratek) in July 1999. Final remediation and disassembly of the facility was completed during June and July 2002. A second characterization survey was performed by another contractor (CH2MHIL and SEC) from August through November 2002. The survey results were published in a report dated March 2003 and stated "Section 7, Conclusions...all radiological levels in the facility are within the guidelines of Regulatory Guide 1.86." The criteria used were:

- 5,000 beta dpm/100 cm^2 average total surface activity
- 15,000 beta dpm/100 cm^2 maximum total surface activity
- 1,000 beta dpm/100 cm^2 removable surface activity
- 5 μr/hr average exposure rate above natural background at 1 meter above the surface

- 10 μr/hr maximum exposure rate above natural background at 1 meter above the surface

The licensee found that all surface contamination levels were less than 5,000 beta dpm/100 cm^2 average. The highest level was 2,288 dpm/100 cm^2 and the highest removable surface activity was 62 dpm/100 cm^2. The maximum dose measured in the CAVALIER area was 6 μr/hr above natural background at 1 meter above the surface. And the average dose was 2.2 μr/hr above natural background at 1 meter above the surface.

The area that was occupied by the CAVALIER was within the area of the UVAR and remained under License No. R-123 during the completion of the decommissioning of the UVAR. After the decontamination and decommissioning of UVAR was completed, the licensee included the CAVALIER area in the FSS Plan and the FSS since it was possible that the area could have been re-contaminated by the decommissioning activities that occurred after the CAVALIER site characterization survey. The area occupied by the CAVALIER was designated as MARSSIM Class 1 and 100% of the area was surveyed. The CAVALIER area was also included within the scope of the Confirmatory Survey performed by an NRC contractor (ORISE).

The CAVALIER area was identified as Reactor Facility ground level Room G007, consisting of a room with a 41 m^2 floor area and a 2.75m deep Reactor Pit. Survey form UVA-FS-37 for survey unit No. 13 indicated that elevated gamma levels were detected here and several other survey units. Further investigation determined that a unique concrete mixture used during building construction was found in each area with elevated gamma radiation levels. The survey data for the area previously occupied by the CAVALIER indicated that the residual radiation level was below the calculated gross DCGL for the area and the CAVALIER met the criteria for license termination under both 10 CFR 20.1401(b)(3) and 10 CFR 20.1402. There was no indication that the area had been re-contaminated by the UVAR decontamination and decommissioning.

c. Conclusions

Based on the above observations, surveys, evaluations, and analyses, the inspector concluded that the licensee's final status survey and ESSAP's confirmatory measurements has adequately demonstrated that the CAVALIER facility satisfies the criteria for license termination in accordance with both 10 CFR 20.1401(b)(2) and 10 CFR 20.1402. The surveys confirmed that the CAVALIER area met the release criteria approved in the CAVALIER DPlan and the DCGLs approved in the UVAR DPlan.

11. OTHER REQUIREMENTS FOR LICENSE TERMINATION OF AN UVAR PART 50 LICENSE (R-66)

a. Background and Requirements

In addition to the license termination requirements of 10 CFR Part 50, Parts 30, 40, and 70 also have requirements for forwarding of specific records to NRC prior to license termination. These requirements include:

	Record Forwarding Requirements
10 CFR 30.51(d)	Prior to license termination, each licensee authorized to possess radioactive material with a half-life greater than 120 days, in an unsealed form, shall forward the following records to the appropriate NRC Regional Office: (1) Records of disposal of licensed material made under 20.2002 (including burials authorized before January 28, 1981), 20.2003, 20.2004, 20.2005; and (2) Records required by 20.2103(b)(4).
10 CFR 30.51(f)	Prior to license termination, each licensee shall forward the records required by 30.35(g) to the appropriate NRC Regional Office.
10 CFR 40.61(d)	Prior to license termination, each licensee authorized to possess source material, in an unsealed form, shall forward the following records to the appropriate NRC Regional Office: (1) Records of disposal of licensed material made under 20.2002 (including burials authorized before January 28, 1981), 20.2003, 20.2004, 20.2005; and (2) Records required by 20.2103(b)(4).
10 CFR 40.61(f)	Prior to license termination, each licensee shall forward the records required by 40.36(f) to the appropriate NRC Regional Office.
10 CFR 70.51(a)	Prior to license termination, licensees shall forward the following records to the appropriate NRC Regional Office: (1) Records of disposal of licensed material made under 20.2002 (including burials authorized before January 28, 1981), 20.2003, 20.2004, 20.2005; and (2) Records required by 20.2103(b)(4); and (3) Records required by 70.25(g).

b. Observations and Findings

UVAR did not disposed of licensed material under 10 CFR 20.2002, 20.2003, 20.2004, and/or 20.2005 therefore records of such disposals do not exist. Therefore, the staff considers that the requirements of 10 CFR 30.51(d)(1), 10 CFR 40.61(d)(1), and 10 CFR 70.51(a)(1) have been met.

The requirements of 10 CFR 30.51(d)(2), 10 CFR 40.61(d)(2), and 10 CFR 70.51(a)(2) can be dealt with collectively because they concern the submittal of records required by 10 CFR 20.2103(b)(4). 10 CFR 20.2103(b)(4) addresses records associated with the release of radioactive effluents to the environment. UVAR is required by license to submit annual reports to the NRC that include radioactive effluent release reports. During the NRC's final survey, through conversations with the licensee, review of the licensee's records, and by observation, the staff conclude that no releases occurred in the period from the last annual report scope through the cessation of decommissioning operations. Therefore, the staff considers that the requirements of 10 CFR 30.51(d)(2), 10 CFR 40.61(d)(2), and 10 CFR 70.51(a)(2) have been met.

Due to the similarity the requirements of 10 CFR 30.51(f), 10 CFR 40.61(f), and 10 CFR 70.51(a)(3) are addressed collectively. These regulations require the licensee to forward information important to decommissioning as required by paragraphs (1), (2), (3), and (4) of 10 CFR 30.35(g), 10 CFR 40.36(f), and 10 CFR 70.25(g), respectively. The staff considers that the licensee has met these requirements through the submittal of: (1) The Decommissioning Plan, (2) Final Status Survey Plan, (3) Site Characterization Survey Reports, (3) Final Status Survey Reports, and (4) any other documents and information relevant to the decommissioning.

c. Conclusions

The licensee has met the requirements of 10 CFR Parts 30, 40, and 70 prior to termination license of the 10 CFR Part 50 license.

12. EXIT MEETING SUMMARY

The inspector presented the inspection results to members of licensee management at the conclusion of the inspections on October 23, 2002, March 11, 2005, and by telephone conference on May 19 and June 9, 2005. The licensee acknowledged the findings presented and did not identify as proprietary any of the material provided to or reviewed by the inspector during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

*T. Bauer	Project Leader, ESSAP
*T. Brown	Field Staff, ESSAP
*R. Eby	Executive Engineer, (Vice President Energy, Environment, and Systems) CH2M HILL
*N. Hertel	Director, Neely Nuclear Research Center
*R. Ice	Manager, Office of Radiation Safety
P. Jones	Project Manager, GTS Duratek Field Services
G. Kalinauskas	Senior Project Engineer, IT Corporation
R. Morton	Field Staff, ESSAP

* Attended first exit meeting

The inspector also contacted other supervisory, technical and administrative staff personnel as well.

INSPECTION PROCEDURE (IP) USED

IP 69001	Class II Non-Power Reactors
IP 40755	Class III Non-Power Reactors
IP 85102	Material Control and Accounting - Reactors
IP 86740	Inspection of Transportation Activities
IP 69013	Research and Test Reactor Decommissioning

ITEMS OPENED AND CLOSED

Opened	None
Closed	None

PARTIAL LIST OF ACRONYMS USED

CAVALIER	Cooperatively Assembled Virginia Low Intensity Education Reactor
CH2MHill	A company name
DCGL	Derived Concentration Guideline Levels
Duratec	GTS Duratec
DPlan	Decommissioning Plan dated May 11, 2001
ESSAP	Environmental Survey and Site Assessment Program
HP	Health Physics
NRC	Nuclear Regulatory Commission
ORISE	Oak Ridge Institute for Science and Education
RWP	Radiation Work Permits
RPP	Radiation Protection Program
RSO	Radiation Safety Officer
SEC	Safety and Ecology Corporation
TS	Technical Specifications
UVA	University of Virginia
UVAR	University of Virginia Research Reactor