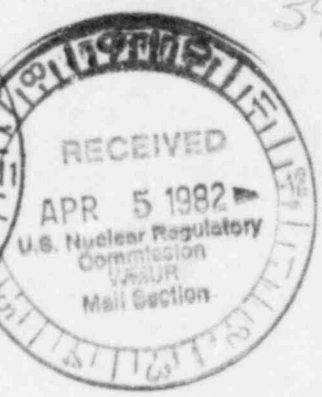
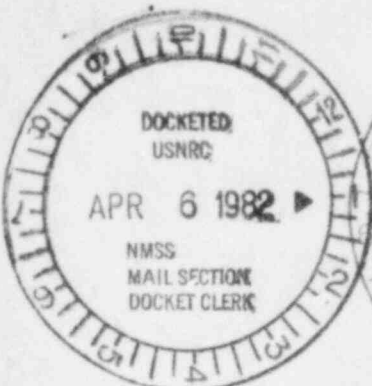


TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II
April 1, 1982

40-1341
PDR
Return to
39655



Mr. Ross A. Scarano
U.S. Nuclear Regulatory Commission
Uranium Recovery Licensing Branch
Mail Stop SS 483
7914 Eastern Avenue
Silver Spring, Maryland 20910

Dear Mr. Scarano:

In the Matter of the) Docket No. 40-1341
Tennessee Valley Authority)

This letter is in response to an August 27, 1981 letter to me from Harry J. Pettengill of your staff, and is an update of my October 15, 1981 letter to you regarding the development of operational radiological safety information for the Edgemont decommissioning project. The radiological safety program (RSP) has been developed and is enclosed for your review and coordination. The generic RSP shows that TVA can ensure radiological safety during the project, and that TVA will comply with the appropriate regulations. In addition, the RSP will be used later as a guide in developing detailed plans in the form of onsite working procedures for implementation during cleanup activities. Established TVA policy and staff review and auditing will ensure that all elements of the project radiation protection procedures are adequate and adhered to at all times.

The contents of the RSP have been based on the outline provided in the referenced August 27, 1981 letter and guidance provided in Regulatory Guide 3.5, Revision 2. The applicable elements of these two documents have been addressed in the RSP.

We will inform you in a timely manner of any significant changes to the RSP. If you have any questions regarding this response, please call David Dunn at FTS 858-2699 in Chattanooga.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure

FEE EXEMPT

20294

Info Only

ENCLOSURE

EDGEMONT MILL DECOMMISSIONING RADIOLOGICAL SAFETY PLAN

I. HEALTH PHYSICS ORGANIZATION/QUALIFICATIONS/INSPECTIONS

Routine health physics support for decommissioning activities will be provided on the site. The supervisor of the Health Physics Department should have a minimum of a bachelor's degree in a science, specialized training in radiation protection, and at least two years of applied radiation protection experience. Technicians should have at least a high school degree, specialized training in radiation protection, and at least one year of applied radiation protection experience.

The supervisor of the Health Physics Department will report directly to the onsite manager. The onsite manager will in turn report directly to the TVA project manager. The supervisor will develop a radiation protection plan and operating procedures for decommissioning operations. The onsite manager, with the assistance of the health physics supervisor, will ensure that the plan and procedures are followed.

TVA will ensure that all elements of the radiation protection procedures are followed. Sufficient administrative controls on the project to ensure adherence to radiation protection procedures will be provided.

TVA's radiation protection staff will conduct unannounced inspections of the project site to review performance for all aspects of radiation safety. Furthermore, a formal annual review of the radiation protection program will be conducted.

As noted, the necessary radiation protection plans will be developed. The initial radiation protection plan and all proposed substantive technical modifications will be formally reviewed within TVA for approval. The TVA health physics staff will provide advice concerning nonroutine technical matters.

The attached chart describes the TVA organization as it relates to review and control of radiation protection plans and activities at the Edgemont uranium mill.

The following document was used as a reference for the activities described in this section.

Nuclear Regulatory Commission (NRC) Regulatory Guide, "Information Relevant to Ensuring That Occupational Radiation Exposures at Uranium Mills Will Be As Low As Is Reasonably Achievable" (draft), August 1980.

II. TRAINING

Radiological protection training will be required for all personnel involved with the decommissioning. All section or departmental supervisors should receive a minimum of 40 hours of indoctrination into radiation and other safety procedures used during decommissioning. This training will emphasize radiation protection fundamentals, such as radiation effects and contamination control, and will also describe in detail the program to be used to minimize radiation exposure and all monitoring programs to be used. The program will also include instructions regarding the administrative actions which will be taken should radiation or other safety procedures be disregarded. Administrative actions will be based on the severity and frequency of violation and will include employee and/or supervisor suspension or termination.

Nonsupervisory employees will receive no less than four hours of radiological protection training. The training will discuss radiation protection fundamentals and outline the safety procedures to be followed. Individuals who may work in airborne radioactivity areas will receive an additional four hours of training. Respirator use and operation will be demonstrated for each individual that is expected to work in areas where such protective equipment is necessary. Medical restrictions for respirator use will be determined during a (pre) employment physical. Respirator fitting/testing will be accomplished during a separate session. Administrative disciplinary actions for nonconformance with safety procedures will be outlined.

All female employees (supervisory and nonsupervisory) will be instructed concerning risks of prenatal radiation exposure.

Retraining employees will be undertaken each calendar year. Supervisory employees will receive no less than eight hours of retraining. Nonsupervisory personnel will receive no less than two hours of retraining.

The following documents were used as references for the activities described in this section.

1. Code of Federal Regulation, Title 10, Part 19, "Notices, Instructions and Reports to Workers; Inspections."
2. Code of Federal Regulations, Title 10, Part 21, "Reporting of Defects and Noncompliance."
3. NRC Regulatory Guide, "Information Relevant to Ensuring That Occupational Radiation Exposures at Uranium Mills Will Be As Low As Is Reasonably Achievable" (draft), August 1980.
4. NRC Regulatory Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure." November 1975.

III. ALARA

In accordance with 10 CFR 20.1 (c), every effort will be made to keep exposure to radiation and radioactive materials as low as reasonably achievable (ALARA). To implement this philosophy, a comprehensive radiation protection plan will be developed prior to the start of decommissioning efforts, prescribing operation limitations and requirements with regard to radiation protection. Operational limitations and requirements for control of exposure to radiation and/or radioactive materials will include engineering controls (limitations of source terms) and work planning (limitation of exposure times) as the primary means of exposure control. Engineering and administrative controls will be imposed in accordance with 10 CFR 20.103. Respirators or other personnel exposure control devices will be used for secondary control, should engineering or work planning prove inadequate or impractical.

Code of Federal Regulations, Title 10, Part 20, "Standards for Protection Against Radiation," is the reference for the requirements of this section.

The radiation protection plan will be drafted in conformance with the following sections.

IV. DIRECT RADIATION EXPOSURE

Occupational radiation exposures will be limited in accordance with the permissible doses specified in 10 CFR 20.101 and the ALARA program. Prior doses will be determined as specified in 10 CFR 20.102. Form NRC-4 (or its equivalent) will be completed for all individuals involved in the cleanup operation and past occupational exposures determined, prior to those individuals receiving doses in excess of those specified in 10 CFR 20.101 (a). As specified in 10 CFR 20.102 (a), a signed statement of current calendar quarter exposure is required before entry to a restricted area in which 25 percent of 10 CFR 20.101 (a) limits may be exceeded. Moreover, the exposure to any individual will be limited administratively not to exceed applicable 10 CFR Part 20 regulations. Although typical exposure rates on the mill site should be in the range of 0.1 to 0.3 mR/h, some localized exposure rates in excess of 3 mR/h have been measured. This necessitates consideration of quarterly and annual dose limits in the decommissioning radiation protection program.

To document the radiation levels on the mill site, gamma surveys will be conducted at all active working areas each week. Personnel dosimeters (TLDs) will be worn by all individuals working onsite in areas where their dose in any calendar quarter may exceed 25 percent of the applicable 10 CFR 20.101 (a) value. Office areas will be monitored using fixed TLD station(s) sited to represent exposures to office personnel. Pocket chambers will be issued to those individuals working in areas with exposure rates in excess of 5 mR/h. Prior to a new work area being opened, gamma surveys will be performed. Contractors, subcontractors, and visitors who will remain onsite in areas other than the mill office buildings for more than one workday will be issued personnel dosimeters. Dosimetry records will be kept onsite for the length of the project and records will be maintained (updated at least quarterly) at TVA offices.

Code of Federal Regulations, Title 10, Part 20, "Standards for Protection Against Radiation," is the reference for the requirements of this section.

V. AIRBORNE RADIOACTIVITY

Exposure to airborne radioactive materials will primarily be limited by engineering controls and workplans (note especially 10 CFR 20.103). This could involve, but is not limited to, wetting of tailings material before disturbance, covering of tailings material during transport, wetting of mill surfaces and equipment, stopping work during period of high winds, and limitation of worktime in areas of high concentration.

Employee exposures to airborne radioactivity will be monitored with continuous air samplers (breathing zone), and will be collected for at least one person in each job category for the length of a full shift, each shift. Employees involved in nonroutine job functions will be monitored on a continuous basis. Exposures for employees not wearing a continuous sampler will be determined from exposure data for their job classification. Area samples (high volume) for airborne radioactivity will be used to supplement the breathing zone samples as necessary.

Airborne radioactivity samples will be analyzed at least for gross alpha activity. The maximum permissible concentration (MPC) (based on gross alpha activity) will be $5 \times 10^{-11} \mu\text{Ci/ml}$.* This MPC will apply to mill dismantling operations as well as ore and tailings operations. Select air filter samples will be composited quarterly and will be analyzed for U^{nat} , ^{230}Th , ^{226}Ra , and ^{210}Pb . Individual employee exposure records will be maintained.

All exposure to airborne radioactivity will be kept ALARA. No employee will be exposed for more than 40 hours per week to airborne radioactivity at uniform concentrations of $5 \times 10^{-11} \mu\text{Ci/ml}$ (gross alpha activity).** The use of respirators will be required when the product of gross alpha activity and expected worktime for any period of the workday is expected to equal or exceed $1 \times 10^{-10} \mu\text{Ci-h/ml}$. The respiratory protection program will follow the requirements of 10 CFR 20.103, Regulatory Guide 8.15 and NUREG-0041.

* $5 \times 10^{-11} \mu\text{Ci/ml}$ is the MPC calculated for tailings using the methodology in note 2 of Appendix B to 10 CFR 20, the MPCs in Appendix B, assuming equilibrium in the ore and 90-percent reduction of uranium in tailings from concentrations in ore.

**If gross alpha samples can routinely be analyzed within four hours of collection, separate radon daughter samples will not be collected. If, however, this cannot be accomplished, radon daughter measurements will be taken and separate exposure records kept.

The following documents were used as references for the activities described in this section.

1. Code of Federal Regulations, Title 10, Part 20, "Standards for Protection Against Radiation."
2. NRC Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection," October 1976.
3. NRC NUREG-0041, "Manual of Respiratory Protection Against Airborne Radioactive Materials," October 1976.

VI. BIOASSAY

Bioassay involves the assessment of internal radioactive materials. As such, accurate measurement and calculation of employee exposures are the primary means of assessing internal exposure. Elements of the airborne radioactivity dosimetry program such as frequency and type of monitoring, respiratory protection, exposure calculations, and record-keeping have been discussed previously.

In areas containing certain concentrations of airborne radioactive material, the potential need for a bioassay program is recognized. If a bioassay program is required, an analysis of urine for long lived uranium daughters is the method which would be expected to be used to assess the uptake of radioactive material by the employees. A urine sample would be expected to be collected prior to an employee starting work on the project and on an annual basis.* Urine would also be collected when preset exposure limits are reached.

Action levels for bioassay results would be included in the project radiation protection plan, and would be based on biological and physical elimination data provided in the references.

The following documents were used as references for the activities described in this section:

1. Code of Federal Regulations, Title 10, Part 20, "Standards for Protection Against Radiation."
2. ICRP-2, "Permissible Dose for Internal Radiation," 1959.
3. ICRP-10, "Evaluation of Radiation Doses to Body Tissues from Internal Contamination Due to Occupational Exposure," April 1967.
4. ICRP-30, "Limits for Intakes of Radionuclides by Workers," July 1978.
5. NRC Regulatory Guide 8.22, "Bioassay at Uranium Mills," July 1978.

*Exceptions for office personnel and other personnel not working in airborne radioactivity areas may be warranted.

VII. CONTAMINATION CONTROL AND LIMITS

Employees, their clothing, and equipment used during decommissioning operations have the potential for becoming contaminated with radioactive materials. Existing mill equipment and structures are also known to be contaminated from past use.

Employees will be provided with work uniforms, gloves, and safety shoes. This equipment will be worn only while on the project site. Showers will be provided and showering will be mandatory prior to an employee's changing into street clothing.* Periodic, unannounced contamination surveys will be performed on no less than a quarterly basis. An action level of 1,000 dis/min/100 cm² will be set. If contamination levels on an employee or his clothing exceed this level, an investigation will be undertaken to determine the cause, and appropriate decontamination efforts will be performed.

Employees will also be provided with an eating area. It will be mandatory that employees wash their hands prior to eating. Contamination levels in the eating area will not exceed the following levels:

Average	1,250 dis/min alpha per 100 cm ²	Averaged over no more than 1m ²
Maximum	3,750 dis/min alpha per 100 cm ²	Applies to an area of not more than 100 cm ²
Removable	250 dis/min alpha per 100 cm ²	Smear Sample

Weekly contamination surveys will be performed in the eating area. The eating area will be cleaned and washed if these levels are exceeded. Eating or smoking in areas other than the designated eating area and the mill office building will be prohibited.

Equipment or vehicles that have been used extensively in the tailings or mill areas or have been used to carry tailings or contaminated materials will not be removed from the restricted areas (which includes the haul road to the disposal site) until a contamination

*Exceptions may be warranted for office personnel.

survey has been performed and acceptable levels of contamination met. Equipment will be considered suitable for release from the site if the following contamination levels are met:

Average	5,000 dis/min alpha per 100 cm ²	Averaged over no more than 1 m ²
Maximum	15,000 dis/min alpha per 100 cm ²	Applies to an area of not more than 100 cm ²
Removable	1,000 dis/min alpha per 100 cm ²	Smear Sample

Variance from these levels, if necessary, will be requested from the NRC.

The following documents were used as references for the activities described in this section.

1. NRC Regulatory Guide, "Health Physics Surveys in Uranium Mills" (draft), August 1980.
2. NRC position paper, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material." November 1976.

VIII. QUALITY CONTROL/QUALITY ASSURANCE

All radiation counting equipment will have quality control checks performed at least once per work shift if in use. Quality control charts will be maintained for each instrument. Appropriate checks will be selected for specific instruments used, but would most likely include checks for background count rate and instrument sensitivity. If quality control sample results deviate from expected statistical bounds of acceptable performance, a detailed investigation will be conducted and corrective action will be taken. Instruments initially failing the quality control checks should not be used until they meet the quality control requirements. Calibrations will be performed at least semiannually for instrumentation used in quantitative analysis. This will involve redetermining calibration factors and proper operating voltage.

Air sampling equipment utilized during the decommissioning will be calibrated according to the description in Regulatory Guide 8.25. This would involve calibration of flow rates at least every six months, with the total error in determination of sampling volume being less than 20 percent. Flow rates for personnel monitoring devices (lapel samplers) will be determined before each use.

Environmental monitoring samples will be collected and analyzed with proper regard for quality control and quality assurance. All sampling and laboratory procedures will be conducted under the auspices of a quality assurance program such as described in Regulatory Guide 8.15.

Health and safety, radiation protection, and environmental tasks will be described in detailed procedures. Use of procedures will be part of the requirements for task performance.

All aspects of radiation monitoring will be inspected for adherence to set policies and procedures.

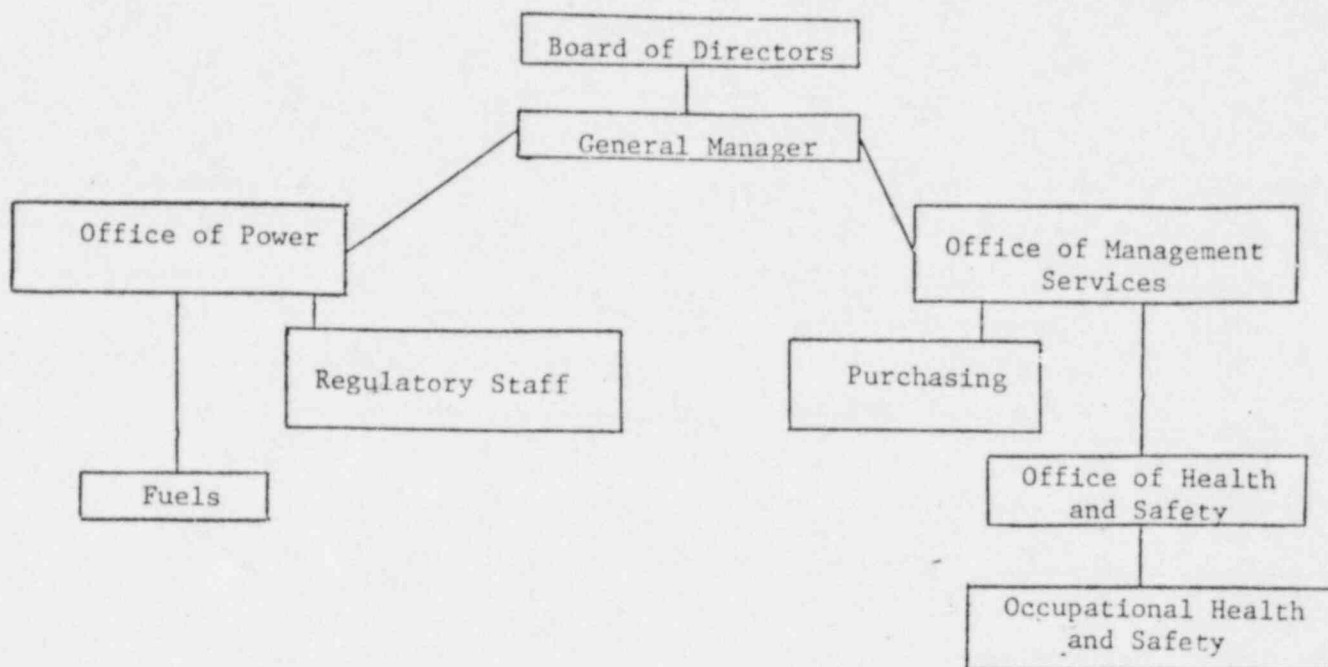
The following documents were used as references for the activities described in this section:

1. Code of Federal Regulations, Title 10, Part 20, "Standards for Protection Against Radiation."
2. NRC Regulatory Guide 8.25, "Calibration and Error Limits of Air Sampling Instruments for Total Volume of Air Sampled," August 1980.
3. NRC Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection." October 1976.
4. NRC Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment," February 1979.

IX ACCIDENTS

The principal radiological accident types which may result from decommissioning operations are spillage from trucks and spillage from ruptured slurry transport lines. Impacts from such accidents are expected to be localized in nature and amenable to prompt cleanup. Detailed plans and procedures for the decommissioning operations would need to address such accidents; however, they have not been discussed herein because they do not appear to present unique health physics problems.

TVA Organizational Chart
For Radiological Activities
at the Edgemont Uranium Mill



Board of Directors: Establishes general policies and programs. Approves projects and specific items which are of major importance, involve important external relations, or otherwise require Board approval.

General Manager: Serves as liaison between the Board and the offices and divisions in the handling of matters of Board concern. Responsible for coordinating the execution of programs, policies, and decisions which the Board of Directors approves or adopts.

Office of Power: Responsible for overall direction of power activities. Develops plans to be recommended to the General Manager and gives prior final review to all plans or programs which affect power program interests.

Regulatory Staff: Acts as primary liaison with NRC, and coordinates TVA's efforts to comply with regulatory requirements of the NRC.

Fuels: Responsible for planning and acquiring fossil and nuclear fuel supplies. Coordinates the implementation of nuclear fuels projects. Arranges for necessary approvals within TVA, and maintains direct contact with the onsite manager.

Office of Management Services: Responsible for the overall direction of Management Services activities - e.g., Office of Health and Safety and Division of Purchasing.

Office of Health and Safety: Responsible for planning and administering programs to protect the health and safety of TVA employees and the general public.

Occupational Health and Safety: Develops and implements radiological hygiene programs to maintain radiation exposure to workers and the general public as low as reasonably achievable and within applicable regulations.

Purchasing: TVA's point of contact with contractors. Administers and enforces contracts.