



Tennessee Valley Authority, Post Office Box 1010, Muscle Shoals, Alabama 35660-1010

Dr. Ronald L. Ritschard
Vice President/Senior Scientist, Resource Group

October 28, 1994

Ms. Diane Heim
Materials Licensing Section
Nuclear Regulatory Commission
101 Marietta Street, Northwest
Atlanta, Georgia 30323

Dear Ms. Heim:

This refers to the application for a new by-product materials license dated January 14, 1994. The application was for authorization of a facility to store radioactive/chemical mixed wastes on the Tennessee Valley Authority Reservation in Muscle Shoals, Alabama. We have reconsidered the requirements and the financial resources available for the facility. We have decided that the building described in our application is no longer suitable. Enclosed is a description of the redesigned facility and the radiological protection aspects of it. The enclosed material replaces Item 9 of the application referred to above.

Ronald B. Maxwell was listed on the application as being responsible for the radiological expertise for this facility. Mr. Maxwell is retiring from TVA in a few months and will then have no responsibility for this activity. For the purposes of this license application, please replace Mr. Maxwell with Jesse H. Coleman, resume provided in the application, as being responsible for the radiological expertise of this license.

If we can do anything to assist you, please write to me or call Mr. Coleman at (205) 386-2993.

Sincerely,

A handwritten signature in black ink that reads 'Ronald L. Ritschard'. The signature is written in a cursive style with a large, stylized initial 'R'.

Ronald L. Ritschard

Enclosure

Control # 255751

Item 9

FACILITIES AND EQUIPMENT

The mixed wastes authorized by this license will be stored in modular buildings that are specifically designed and built to store hazardous wastes. The buildings are designed and built by Safety Storage Inc., 3 Dunwoody Park #103, Atlanta, Georgia 30338. They are widely used throughout the world to store hazardous wastes.

The Safety Storage Hazardous Waste Storage Buildings (SSHWSBs) are Factory Mutual (FM) approved, relocatable hazardous materials storage units. They are prefabricated and transported to the site. They are Underwriters Laboratory (UL) classified and constructed from UL-approved materials. Each SSHWSB is constructed from 10 gauge, corrosion protected sheet steel welded to 10 gauge, corrosion protected, formed steel studs. The roof/ceiling is constructed of noncombustible, 12 gauge, corrosion protected steel sheet continuously welded to 10 gauge, corrosion protected, formed steel purlins on 30-inch centers. The roof is sloped for rain water runoff. No mechanical fasteners penetrate the exterior walls or roof. No lightweight exterior steel skins, plywood, or rubber membranes are used in wall or roof construction.

The SSHWSBs are designed to comply with national and regional codes that reflect the requirements of the Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), the National Fire Protection Association (NFPA), the Uniform Fire Code (UFC), the Standard Building and Fire Prevention Codes, and the National Electrical Code (NEC).

Several models of SSHWSBs with capacities of from 5 to 45 55-gallon drums are available. Each of these SSHWSBs provides security, weather protection, fire safety, ventilation, and groundwater protection. The Tennessee Valley Authority may use several of these models to satisfy the requirements of this project.

Groundwater protection for the SSHWSBs is provided by integral, built-in sumps below the 55-gallon drums. They provide a volume of up to 30 percent of the cumulative volume of all of the drums. The sump is constructed of heavy gauge steel that is welded and corrosion protected. The sump is covered with a steel floor grating of rectangular design with crossbars welded at right angles to bearing bars. If a drum leaks and radioactive material is found in a sump, then the material will be placed in a drum, the leaking drum will be placed in an overpack, and the sump and grating will be decontaminated or disposed of properly.

Fire protection for each SSHWSB will be provided by built-in, dry chemical, fire-suppression systems. These fire-suppression systems are designed for classes A, B, and C fires and will be installed during construction according to NFPA Standard No. 17, "Dry Chemical Extinguishing Systems." The agent tanks and releasing device are housed inside a weatherproof and tamperproof enclosure located on an exterior wall of each building. Fusible links will be installed inside the buildings for automatic system actuation and detection. The handles on the control heads as well as a remote pull station are provided for manual system activation. Once the system is initiated, a multipurpose ABC dry chemical extinguishing agent is expelled from the pressurized agent cylinders through an interior preengineered piping network and out the discharge nozzles for total flooding application. Simultaneously, an exterior UL-listed fire alarm sounds, and the system is also equipped with remote annunciation capability. The likelihood of an accidental fire will be minimized to the extent possible. Smoking in or near the SSHWSBs will be prohibited. The high expansion foam fire-suppression system described in Item 10 of the application will not be used.

The buildings will be located behind the Powers Stores complex near Wilson Dam. The security of the radioactive materials against unauthorized removal will be ensured by locking the fences and the SSHWSBs whenever personnel are not working at the site. The SSHWSBs will be located inside two 10-foot chain-link fences that are normally locked except during periods of active work. The inner fence will contain only the SSHWSBs and a hazardous waste storage building. The area inside this inner fence will be dedicated to the mixed waste storage facilities and to the hazardous waste storage facility. These two facilities will share the same staff for nonradiological activities. The gate to the outer fence will be locked when work is not being conducted inside the fenced area; however, several work areas are located in the outer fenced area besides the two waste storage facilities.

The office of the hazardous storage building will be used as the office for the mixed waste storage facility. A calibrated and operable frisker will be kept there for surveys of personnel working with the mixed waste containers. Each SSHWSB containing mixed waste will be a radiologically controlled area. The frisker will be temporarily located near the SSHWSBs when workers enter them. All workers handling the mixed waste containers will be required to use the frisker to survey themselves for contamination. Radiation Safety and Control (RS&C) will survey the restricted areas for dose rate and contamination at least quarterly. A frisker will not be permanently located near or in an SSHWSB.

Protective clothing will also be stored in the office of the hazardous waste storage building. An emergency shower located there may be used if a worker becomes contaminated with mixed wastes. A tray will be used to catch the shower runoff to prevent unmonitored effluent into the sewer. The shower runoff will be analyzed for contamination concentrations and disposed of in accordance with appropriate regulations.

The area where the SSHWSBs are to be located is seismically stable and has not experienced a major earthquake in recorded history. The nearest major earthquake occurred over 170 years ago in New Madrid, Missouri, about 150 miles from Muscle Shoals. Thus, it is highly unlikely that this facility will be damaged by an earthquake.

The area is well drained and is over 20 feet above the mean elevation of Wilson Lake and over 100 feet above the mean elevation of Pickwick Lake. The building will be above the elevation of Wilson Dam less than a mile away. Thus, flooding of the facility is extremely unlikely.

On the basis of calculations reported in the Browns Ferry Nuclear Plant (about 40 miles east of Muscle Shoals) final safety analysis report, the mean recurrence interval for a tornado at any given location in this area is 1 in 600 years. Thus, it is unlikely that this facility will be damaged by a tornado.

The drums in this facility will not be stacked higher than two drums. Placement and stacking of the drums will be done in such a manner as to ensure the stability of the drums and to prevent damage or deformation of the drums.

The dose rates from most drums of waste are expected to be less than 1 mrem/hour at distances of 1 meter. Drums of waste with the higher dose rates will be placed in the center of the storage area and shielded by drums of lower activity material to the extent practical. If necessary, portable shields of concrete blocks, lead, or other suitable material will be used to reduce dose rates to acceptable levels. Doses to members of the public (such as truck drivers or workers not trained to enter the buildings) will meet a dose limit of 2 mrem/hour as specified in 10 CFR 20.1301. Workers will be instructed to minimize the time spent in higher dose rate areas, and dose rates in the storage area will be reduced to the extent practical. There is no office or other high-occupancy area near the SSHWSBs.

Attention will be given to the chemical compatibility of waste containers and their contents. Drums will be selected to not react with their contents. This selection will be made at the nuclear plants where the drums are filled.

Attention will be paid to the chemical characteristics of the contents of different drums that are placed near each other. They will be sorted by hazard class. Containers of acids and flammable liquids will be placed in separated SSHWSBs.

If a 55-gallon container becomes damaged or shows signs of leaking or of serious deterioration, it will be placed in an overpack container without requiring that the container be opened. Both metal and polyethylene overpacks are available for optimum chemical compatibility with the drum contents to minimize possible degradation of the

overpacks. Necessary equipment will be in place and readily available to place a drum in an overpack if necessary.

No area is expected to be radiologically or chemically contaminated. Therefore, under ordinary circumstances protective clothing will not be required. Personnel handling containers of radioactive materials will wear rubber gloves. In the event of a spill or other emergency, additional protective clothing such as shoe covers, coveralls, and head covers will be required as determined by the responsible supervisor or by RS&C.

The ventilation system will be an explosion-proof, electromechanical system designed for maximum safety and regulatory compliance. The air exchange rate will exceed six changes per hour. It will automatically shut down in the event of a fire. The air intake will be located within 12 inches of the floor to minimize the accumulation on heavier-than-air hazardous vapors. The system exhaust will be located near the exterior roofline to maximize hazardous vapor dispersion.

The waste will be packaged in a form ready for transport and disposal when it arrives at this facility. The contents of each drum will be clearly labeled in accordance with NRC regulations.

The mixed wastes presently held at TVA's nuclear plants that may be shipped to this facility are class A radioactive wastes as defined by 10 CFR 61.55. They are classified as:

1. Solid, characteristic waste (based on lead content); paint stripper, paint chips, and paint chips mixed with rags.
2. Liquid, characteristic waste (based on lead content); waste oil.
3. Liquid, flammable (ignitable); waste paint, paint thinner, waste oil, flammable liquid, Varsol, oil/water mixture, diesel fuel, waste liquid, alcohol, and scintillation fluid in glass vials.
4. Liquid, corrosive; citric acid and phosphoric acid.
5. Liquid, listed waste; grease and spent halogenated degreasing solvent.

Some of the wastes described above may be shipped directly to an approved vendor for disposal instead of to this facility for storage. Some of the wastes described above may be reclassified based on future testing and may not be shipped to this facility.