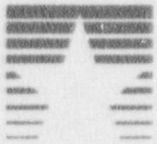

TU ELECTRIC

Log # TXX-89560
File # 10110
911.4

August 31, 1989

William J. Cahill, Jr.
Executive Vice President

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 AND 50-446
ADVANCE FSAR CHANGE SUBMITTAL-
SOLID WASTE MANAGEMENT SYSTEM

Gentlemen:

The enclosure to this letter provides an advance submittal of FSAR changes related to the Solid Waste Management System.

In order to facilitate NRC staff review of these changes, supporting information related to this FSAR change is organized as follows:

1. Draft revised FSAR pages, with changed portions identified by a revision bar in the margin (denoted as "DRAFT"), as they are to appear in a future amendment.

2. Line-by-line description/justification of each revised FSAR item together with the group and classification designation, as well as an indication of whether the change impacts the SER/SSER.

3. A copy of the related SER/SSER sections.

4. An index page containing the title of "bullets" which consolidate and categorize similar individual FSAR changes by subject and related SER section.

5. A discussion of each "bullet" which includes:

   The line-by-line description/justification for each FSAR item related to the "bullet" which has been screened as a group 1 or 2 item or a group 3 or 4 item that impacts the existing SER/SSER's. (The discussion of these groups is contained in TU Electric letter TXX-88467 dated June 1, 1988.)

A001
1/1

The bold/overstrike version of the revised FSAR pages referenced by the description/justification for each item identified above. The bold/overstrike version facilitates review of the revisions by highlighting each addition of new text in bold type font and overstriking with a slash (/) the portion of the text that is deleted. In some cases, where the bold overstrike version is unavailable, a hand marked-up version will be provided.

TU Electric requests that the NRC perform an expedited review of this FSAR change and inform us as to its acceptability.

Sincerely,

William J. Cahill, Jr.

William J. Cahill, Jr.

By: Roger D. Walker
Roger D. Walker
Manager, Nuclear Licensing

RLA/smp
Enclosure

c - Mr. R. D. Martin, Region IV
Resident Inspectors, CPSES (3)

Enclosure to TXX-89560
August 31, 1989

Advance FSAR Change Relating to
Solid Waste Management System

11.4 SOLID WASTE MANAGEMENT SYSTEM

The solid waste management system (SWMS) is designed to control, collect, condition, handle, process, package, and temporarily store, prior to offsite shipment, solid radioactive waste generated as a result of normal operation, including anticipated operational occurrences. The SWMS is a major subsystem of the WPS. The SWMS consists of the Radioactive Waste Solidification System (RWSS) and the waste baling subsystem. The RWSS, located in the Fuel Building, is designed to serve Units 1 and 2. The waste baling subsystem has a baler located in each Containment Building and in the Fuel Building. 54

11.4.1 DESIGN BASES

11.4.1.1 Design Objectives

Q320.8
DRAFT

The design objectives of the RWSS and waste balers are to meet the requirements of 10 CFR Parts 20, 50, 61 and 71 and United States Department of Transportation (DOT) Hazardous Materials Regulation 49 CFR Parts 170 through 178. The details of the RWSS and the baling subsystem are shown in ATCOR topical report no. 132A. DRAFT

DRAFT

The RWSS is designed to safely condition and supply spent resins, spent filter cartridges, evaporator concentrates, reverse osmosis wastes, and chemical drain tank contents to a vendor's mobile processing skid for solidification or dewatering, whichever is appropriate. Connections have been provided to allow for the bulk disposal of wastes to a truck mounted or mobile waste processing system. These connections supply waste from the Chemical Drain Tank, Waste Conditioning Tank, and the Spent Resin Transfer System. 46 4

The baling subsystem uses a compactor type-baler to package low-radiation-level compressible wastes such as paper, disposable

clothing, rags, towels, floor coverings, shoe covers, plastics, cloth smears, and respirator filters in 55-gal drums. These wastes are products of plant operation and maintenance.

54

11.4.1.2 Design Criteria

DRAFT

The input to the SWMS is from various sources. The incompressible solids are packaged in disposable containers while the compressible solid wastes are collected and compressed (baled) into drums or sent offsite for vendor processing. The various sources, quantities, and
46 activity levels are detailed in Table 11.4-1. Maximum volumes may be produced as a result of excessive equipment leakage, steam generator
DRAFT tube leakage, and so forth.

The principal nuclides shipped from the plantsite include the following:

Iodine-131	Iron-59
Cesium-134	Manganese-54
Cesium-136	Manganese-56
Cesium-137	Molybdenum-99
Cobalt-58	Strontium-89
Cobalt-60	Strontium-90
Iron-55	Chromium-51
Hydrogen-3	

The seismic design classification of the Fuel Building housing the SWMS is discussed in Section 3.2. The seismic design and equipment design codes for the RWSS components and piping are in accordance with
29 ETSB Technical position 11-1. See Appendix 17A.

11.4.2 SYSTEM DESCRIPTION

11.4.2.1 Solidification System Description

The ATCOR System is as described in ATCOR topical report ATC-132A. Only those components necessary for the collection and conditioning of the various waste streams prior to discharge via the bulk disposal connections on elevation 810' of the Fuel Building are utilized. | 54

The major ATCOR system components which are utilized include the Waste Conditioning Tank, Waste Feeder Pumps, Emergency Waste Return Pump, Powdex Transfer Pump, Chemical Addition Tank and their associated valves, piping and controls. | 54

11.4.2.2 Spent Filter Cartridge Assembly Processing

Transfer of expended filter cartridge assemblies from the filter housing to the waste processing area may be accomplished by means of a filter transfer cask. The transfer cask is positioned next to the compartment of the filter to be replaced. The compartment shielding plug is removed and placed outside of the work area. The filter housing head bolts are disengaged and the head swung out of the way to allow access for the transfer cask. The base of the cask is removed and the cask positioned concentrically above the filter housing. The cask hoist grapple is lowered to engage the filter cartridge assembly and the cartridge raised into the shielded cavity. The base of the transfer cask is replaced, then the cask is moved by monorail to the filter drop zone hatchway where it is lowered into the Fuel Building. An alternate method is to use this hoist to remove the filter and lower it to the Fuel Building; however, a shielded container is employed rather than the filter transfer cask while transporting the filter. The method to be used is predicated on the filter dose rate. | DRAFT | 50 | DRAFT

Filters may be processed on site to comply with state, federal and burial site transportation and disposal regulations or they may be shipped to a vendor for offsite processing. | DRAFT

4 11.4.2.3 Large Solid Waste Materials and Equipment

Q320.8

4 Large waste materials and special equipment that have been neutron activated during reactor operation (e.g., core components) are handled and packaged in a safe manner on a case-by-case basis.

4 11.4.2.4 Baling Subsystem Description

Q320.8

DRAFT The physical layout of this subsystem is shown on Figure 1.2-15, 1.2-21 and 1.2-38.

Q320.8

4 Baling of compressible low-radiation-level solid wastes into drums is accomplished in the following manner.

Q320.8

4 Solid wastes are inserted in an open drum. Subsequently, the drum is
4 placed in the baler, and the shroud door is closed. An operator initiates the compaction process by positioning an up/down switch in the down position, thus energizing the hydraulic pump motor. The hydraulic pressure forces the ram down into the drum, thereby compressing the wastes. To retract the ram, the operator positions the switch in the up position. The shroud door is opened, and additional wastes are added to the drum. The cycle is repeated until the drum is full, the lid is installed, and the clamping ring is tightened. Drums are then stored pending shipment.

Q320.8

4 The Fuel Building baler's shroud is ducted to the plant ventilation system to remove dust or particles that may be emitted from the drum during compression of the wastes. The Containment balers are not ducted to the ventilation system; however, each baler has its own self contained exhaust air filtration system. The air filtration system

Q320.8
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consists of a prefilter and a HEPA filter in series. This provision eliminates any potential hazard from airborne radioactivity. In addition, the assembly incorporates a fail-safe switch that does not permit baler operation with the baler door open.

11.4.2.5 Component Description

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All components which are located in the Fuel Building are at elevations of 810, 822, and 840 feet. The Containment balers are at elevation 905 ft in each Containment.

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Design parameters of the RWSS components are listed in ATCOR topical report No. 132A. Other associated components of the SWMS are as follows:

1. Containers

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The containers utilized with the solidified or dewatered radioactive waste streams shall be of strong, tight construction and shall meet all applicable DOT, NRC and burial site requirements pertaining to the storage, shipment, and burial of radioactive waste.

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Dry solid wastes shall be packaged in strong, tight containers meeting all applicable DOT, NRC and burial site requirements. Examples of such containers are the DOT-17H-55 steel drum and strong, tight boxes of either metallic or wooden construction.

2. Shipping Shields

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The shipping shields are used to protect personnel from radiation exposure during shipment and other operational

46 DRAFT

handling of the filled containers. The shields have a lead core with inner and outer shells of steel and are designed to accommodate disposable containers. Lifting devices are permanently attached to the shields and are capable of supporting 1-1/2 times the weight of the loaded shipping shield.

4 Q320.8 DRAFT 4

3. Filter Transfer Cask

One filter transfer cask is provided to be used as a shielding and carrier vehicle to protect personnel from radiation exposure while transferring spent filter cartridges from the filter housing to the waste processing area. Movement of the filter transfer cask is by a monorail. The cask is provided with a removable drip pan to collect any dripping liquid from the filter cartridges. The cask is designed with a stainless steel interior and flush connections located on the top of the cask to facilitate washdown and decontamination. The grapple assembly that is used to lift the filter cartridge is permanently attached to the inside of the cask. The grapple has a fail-safe feature which locks the filter in place in the event of power failure.

4 Q320.8 DRAFT 4

4. Flat-Bed Cart

One rail-mounted flat-bed cart is provided to transport disposable containers with shipping shields. The cart has three individual drive systems: continuous forward and reverse, creep forward and reverse, and manual emergency override.

5. Baler

Q320.8
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The baler is a commercially available assembly used in conjunction with standard 55-gal drums which receive the low radiation level, solid, compressible wastes. Compaction of the wastes is performed after an amount of waste sufficient to fill a drum has been accumulated.

11.4.2.6 Other Design Features

1. Process Control Program

54

Waste processing is performed by a mobile processing vendor. The TU Electric Process Control Program requires that the vendor operate in accordance with a process control program and procedures which have been reviewed and approved by TU Electric. Additionally, any vendor selected to provide services or products used to achieve the 10 CFR 61 stability requirements shall have a topical report for that purpose either under review or already approved by the NRC.

DRAFT

2. Overflow of Tanks

The waste conditioning tank is provided with an ultrasonic level sensing device which provides level indication over the range of tank operating levels. In addition, level detectors are provided which provide interlock inputs for waste conditioning tank high and low levels. The high level interlock stops waste stream addition to the waste conditioning tank while the low level interlock stops the tank agitator.

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3. Tanks Using Compressed Gases

Compressed gas is not directly used in any SWMS tank. However, the waste conditioning tank is vented to the plant ventilation system since bead resin slurry is transported to the waste conditioning tank from the spent resin storage tanks by means of nitrogen gas pressure. The volume and flow rate of the gas used

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for transferring one batch is estimated to be 1200 scf at 50 scfm. The expected radionuclide concentration of the vent gases will be negligible. The treatment provided (atmospheric cleanup system) for the vent gases is described in Section 9.4.

54 11.4.2.7 Packaging, Storage, and Shipment

54 1. Packaging

54 The SWMS product is a burial package which is classified as a normal form of packaged hazardous material in accordance with 49 CFR Part 173. A NRC permit for each container is not required, since most containers are shipped LSA, Type A. For greater
54 quantities, a lead shielding or overpack is used which has a NRC
DRAFT permit.

2. Storage

DRAFT
26 Capacity for storage of at least one hundred forty-four 55-gallon drums is provided in Area 247 in the Fuel Building (see Figure
DRAFT 1.2-38). Wastes may also be stored outside the Fuel Building.
Q320.8
DRAFT Storage time is a variable and depends on shipment schedules and disposal site availability. Radioactive decay, as a function of
4 the storage interval, is considered to be minimal, and credit for the decay is not taken during shielding calculations.

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Prior to removal of a drum for shipment, drum smear samples are taken to determine the surface activity. If required, the drum surface is decontaminated and smear samples are taken again to determine if the desired decontamination has been achieved.

3. Shipment

4
Q320.8
DRAFT
4

Radwastes are stored in a designated storage area. Shipment of the radwaste originates from the north end of the Fuel Building by either rail or truck. All radwaste shipments are in compliance with the regulatory standards and requirements of the NRC, DOT, and the Texas Regulations for Radiation Control, and are consistent with the methods discussed in Environmental Survey of Transportation of Radioactive Materials to and from Nuclear Power Plants and with the Draft Environmental Statement Concerning Proposed Rulemaking Action.

11.4.2.8 Instrumentation and Control

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The instrumentation and controls of the RWSS are designed by the equipment supplier and are detailed in the ATCOR topical report 132A.

11.4.2.9 Safety Evaluation

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This RWSS and the balers are not safety-related and cannot affect the safe shutdown of the plant or the operation of other systems which are required to safely shut down the plant. Failures of the RWSS that can cause potential problems in daily operation of the RWSS and increase normal operator exposure have been analyzed and are discussed in the ATCOR topical report No. 132A.

TABLE 11.4-1 | 52

SOURCE INPUTS* | DRAFT
(2-Unit Operation) | DRAFT

Type of Waste	Expected Annual Volume (ft^3)	Avg. Container Contact Dose Rate	DRAFT
Dry Active Waste (DAW)	10,000	≤ 50 mR/hr.	DRAFT
Processed Wet Waste			DRAFT
Evap Conc and Chem Drains	270	≤ 200 mR/hr.	DRAFT
Filter Cartridges	1,000	≤ 5 R/hr.	DRAFT
Resins	1,510	≤ 100 R/hr.	DRAFT
Total Waste	12,780		DRAFT

* Based on current industry average for PWRs. | DRAFT

Figure 11.4-2 has been deleted.

COMANCHE PEAK S.E.S. FINAL SAFETY ANALYSIS REPORT UNITS 1 and 2
FLOW SHEET BALER - SUBSYSTEM
FIGURE 11.4-2

FSAR Page (as amended)	Group	Description
11.4-1	3	Adds 10CFR61 to the list of federal regulations whose requirements are to be the design objectives for the Radioactive Waste Solidification System. Revision: This change is made to indicate that the Radioactive Waste Solidification System must satisfy the applicable 10CFR61 requirements. FSAR Change Request Number: 89-475.01 Related SER Section: 11.2.3.1 SER/SSER Impact: No
11.4-1, 3	4	Deletes the word "solidification" on both pages and, on page 11.4-3, substitutes the word "processing". Clarification: These changes more properly reflect the correct terminology and avoid the misinterpretation that only solidification operations will be performed. FSAR Change Request Number: 89-475.03 Related SER Section: 11.2.3 SER/SSER Impact: No
11.4-1, 4	4	See Page No(s):Fig. 11.4-2 Deletes Figure 11.4-2, "Flow Sheet [of] Baler-Subsystem", and references thereto. Clarification: This deletion is made since the figure oversimplifies the process steps and could lead to misinterpretation. FSAR Change Request Number: 89-475.02 Related SER Section: 11.2.3 SER/SSER Impact: No
11.4-2	3	Deletes wording which indicates that liquids are packaged in disposable containers. Correction: This change is made to reflect the fact that existing procedures do not permit offsite shipment of radioactive waste in liquid form. FSAR Change Request Number: 89-475.04 Related SER Section: 11.2.3 SER/SSER Impact: No
11.4-2	3	Adds a phrase to indicate that compressible solid wastes could also be sent offsite for vendor processing. Update: This change is made to permit utilization of the offsite processing option if it is economically viable.

FSAR Page (as amended)	Group	Description
		FSAR Change Request Number: 89-475.05 Related SER Section: 11.2.3 SER/SSER Impact: No
11.4-2	2	Deletes the statement which indicated that spent filter cartridges are expected to be changed once every two years. Update: This change is made since industry experience indicates that filter changeout (based on pressure drop or radiation measurements, as is planned for use at CPSES) should occur sooner than every two years. FSAR Change Request Number: 89-475.06 Related SER Section: 11.2.3 SER/SSER Impact: No
11.4-3, 4	2	Modifies the text to describe an alternate method for spent filter cartridge removal and transfer. Update: This change is made to provide an alternate means that could be used if the radiation levels from the spent filter cartridge are sufficiently low. FSAR Change Request Number: 89-475.07 Related SER Section: 11.2.3 SER/SSER Impact: No
11.4-4	3	Modifies the last sentence in Section 11.4.2.2 to include the use of offsite processing for expended filter cartridges. Addition: This change is made to reflect the fact that offsite processing of expended filter cartridges is an option. FSAR Change Request Number: 89-475.08 Related SER Section: 11.2.3 SER/SSER Impact: No
11.4-6	4	Deletes the sentence, in the subsection on "Shipping Shields", that described the use of 4-inch thick, lead core radiation shields. Clarification: This change is made to avoid the misinterpretation that only 4-inch thick shields are used in this application. FSAR Change Request Number: 89-475.09 Related SER Section: 11.2.3 SER/SSER Impact: No
11.4-6	3	Deletes references to the drumming and other associated

FSAR Page (as amended)	Group	Description
		plant areas and, in one instance, replaces the former with "waste processing area". Correction: This change is made to indicate the proper designation for what was originally designated as the drumming area. (This area was originally intended for cement solidification.) the other areas are no longer applicable for the operation being described.) FSAR Change Request Number: 89-475.10 Related SER Section: 11.2.3 SER/SSER Impact: No
11.4-7	3	Completely replaces the text of subsection 1 with a description of certain aspects of Rev. 0 of the TU Electric Process Control Program. Addition: This change is made to reflect the applicable requirements of Rev. 0 of the TU Electric Process Control Program. FSAR Change Request Number: 89-475.11 Related SER Section: 11.2.3 SER/SSER Impact: Yes SER Section 11.2.3 should be revised to reflect the fact that TU Electric submitted Rev. 0 of its Process Control Program (with letter TXX-89196, dated April 17, 1989) which does assure solidification of "wet" solid waste.
11.4-8	2	Deletes the statement, in the subsection "Packaging", indicating that there is no danger of radioactive spills caused by dropping of containers because the contents are solid. Correction: This change reflects the commitment in Rev. 0 of the TU Electric Process Control Program that radioactive waste sent offsite for burial will be processed by dewatering. FSAR Change Request Number: 89-475.12 Related SER Section: 11.2.3 SER/SSER Impact: No
11.4-8	3	Deletes the statement, in the subsection on "Storage", which indicated that storage capacity for 50 cu. ft. containers is provided in the Drum Storage Area. Correction: This change reflects the fact that these containers will no longer be stored in the Drum Storage Area since other waste management system equipment is now located there.

FSAR Page (as amended)	Group	Description
		plant areas and, in one instance, replaces the former with "waste processing area". Correction: This change is made to reflect the fact that the drumming area is no longer the proper designator. (It had been so designated for the cement solidification process which was subsequently abandoned; as a result, the other areas are no longer applicable for the operation being described.) FSAR Change Request Number: 89-475.10 Related SER Section: 11.2.3 SER/SSER Impact: No
11.4-7	3	Completely replaces the text of subsection 1 with a description of certain aspects of Rev. 0 of the TU Electric Process Control Program. Addition: This change is made to reflect the applicable requirements of Rev. 0 of the TU Electric Process Control Program. FSAR Change Request Number: 89-475.11 Related SER Section: 11.2.3 SER/SSER Impact: Yes SER Section 11.2.3 should be revised to reflect the fact that TU Electric submitted Rev. 0 of its Process Control Program (with letter TXX-89196, dated April 17, 1989) which does assure solidification of "wet" solid waste.
11.4-8	2	Deletes the statement, in the subsection "Packaging", indicating that there is no danger of radioactive spills caused by dropping of containers because the contents are solid. Correction: This change reflects the commitment in Rev. 0 of the TU Electric Process Control Program that radioactive waste sent offsite for burial will be processed by dewatering. FSAR Change Request Number: 89-475.12 Related SER Section: 11.2.3 SER/SSER Impact: No
11.4-8	3	Deletes the statement, in the subsection on "Storage", which indicated that storage capacity for 50 cu. ft. containers is provided in the Drum Storage Area. Correction: This change reflects the fact that these containers will no longer be stored in the Drum Storage Area since other waste management system equipment is now located there.

FSAR Page (as amended)	Group	Description
		FSAR Change Request Number: 89-475.13 Related SER Section: 11.2.3.1; SSER1 11.2.3.1 SER/SSER Impact: Yes Section 11.2.3.1 of SSER No. 1 should be revised to reflect the fact that the Drum Storage Area will not be used for storage of waste containers.
11.4-8	3	Adds a sentence, in the subsection on "Storage", indicating that additional waste container storage capacity is available (in order to replace what was lost in the Drum Storage Area). Addition: This change is made to reflect the fact that wastes may also be stored outside the Fuel Building. FSAR Change Request Number: 89-475.14 Related SER Section: 11.2.3.1; SSER1 11.2.3.1 SER/SSER Impact: Yes Section 11.2.3.1 should be further revised to reflect the fact that storage of waste containers will also be accomodated outside the Fuel Building in order to provide for at least a 30 day capacity.
11.4-8	3	Deletes the text, in the subsection on "Storage", that refers to the drumming station, solidification room and drum storage area. Correction: This deletion reflects the fact that the ATCOR waste solidification system will not be used. FSAR Change Request Number: 89-475.15 Related SER Section: 11.2.3 SER/SSER Impact: No
11.4-8	4	Modifies the statement, in the subsection on "Storage", which describes the (in-plant) storage time for waste containers. Clarification: This change is made to indicate that disposal site availability is also an influencing factor in establishing onsite waste container storage time (capacity). FSAR Change Request Number: 89-475.16 Related SER Section: 11.2.3.1; SSER21 11.2.3 SER/SSER Impact: No
11.4-9	3	Modifies the description, in the subsection "Storage", of the process used to reduce contamination on the drum surface. Correction: This change is made to avoid the misinterpretation that washing of the drum surface (with its attendant clean-up water handling operations) is the only means to be

FSAR Page (as amended)	Group	Description
		used for effecting decontamination. FSAR Change Request Number: 89-475.17 Related SER Section: 11.2.3 SER/SSER Impact: No
Table 11.4-1	4	Completely replaces the contents of Table 11.4-1. Update: This change reflects the results of industry experience in reducing waste volumes generated in radioactive waste processing operations. FSAR Change Request Number: 89-475.18 Related SER Section: 11.2.3 SER/SSER Impact: No

11 RADIOACTIVE WASTE MANAGEMENT

11.1 Summary Description

The radioactive waste management systems are designed to provide for controlled handling and treatment of liquid, gaseous, and solid wastes. The liquid radioactive waste system processes wastes from equipment and floor drains, sample wastes, decontamination and laboratory wastes, and laundry and shower wastes. The gaseous radioactive waste system provides holdup capacity to allow decay of short-lived noble gases stripped from the primary coolant and treatment of ventilation exhausts through high-efficiency particulate air filters and charcoal adsorbers, as necessary, to reduce releases of radioactive materials to "as low as is reasonably achievable" (ALARA) levels in accordance with 10 CFR Part 20 and 10 CFR Part 50.34a. The solid radioactive waste system provides for solidifying, packaging, and storing radioactive wastes generated during station operation before they are shipped offsite to a licensed facility for burial.

In its evaluation of the liquid and gaseous radioactive waste systems, the staff has considered: (1) the capability of the systems for keeping the levels of radioactivity in effluents ALARA based upon expected radwaste inputs over the life of the plant; (2) the capability of the systems to maintain releases below the limits of 10 CFR Part 20 during periods of fission product leakage from the fuel at design levels; (3) the capability of the systems to meet the processing demands of the station during anticipated operational occurrences; (4) the quality group and seismic design classification applied to the system equipment and components and to the structures housing these systems; (5) the design features that will be incorporated to control the releases of radioactive materials in accordance with General Design Criterion 60; and (6) the potential for gaseous releases as a result of hydrogen explosions in the gaseous radwaste system.

In its evaluation of the solid radioactive waste treatment system, the staff has considered: (1) system design objectives in terms of expected types, volumes, and activities of waste processed for shipment offsite; (2) the applicant's process control program; (3) waste packaging and conformance to applicable federal packaging regulations, as well as provisions for controlling potential radioactive airborne dusts during bailing operation; and (4) provisions for onsite storage of waste before shipment offsite.

In its evaluation of the process and effluent radiological monitoring and sampling system, the staff has considered the system's capability: (1) to monitor all normal and potential pathways for release of radioactive materials to the environment; (2) to control the releases of radioactive materials to the environment; and (3) to monitor performance of process equipment and to detect radioactive materials leakage between systems.

During its evaluation, the staff determined the quantities of radioactive materials that will be released in liquid and gaseous effluents and the amount

of radioactive waste that will be shipped offsite to a licensed burial facility. In making these determinations, the staff considered waste flows, activity levels, and equipment performance, consistent with expected normal plant operation, including anticipated operational occurrences, for an assumed 30 years of normal plant operation.

The estimated releases of radioactive materials in liquid and gaseous effluents were calculated using the PWR-GALE Code described in NUREG-0017. The liquid and gaseous source terms are given in Table 11.1 and Table 11.2, respectively. The principal parameters used in these calculations are given in Table 11.3, and assumptions used by the staff are consisted with values given in NUREG-0017.

The source terms were used to calculate the individual and population doses in accordance with the mathematical models and guidance contained in Regulatory Guide 1.109 (Revision 1). Meteorological factors in the dose calculations were determined using the guidance in Regulatory Guide 1.111 (Revision 1). The calculated individual doses are given in Table 11.4.

Based on the evaluation below, the staff has concluded that the liquid and gaseous radioactive waste processing systems for Comanche Peak Units 1 and 2 are capable of maintaining releases of radioactive materials in liquid and gaseous effluents to ALARA levels in accordance with 10 CFR Part 50.34a and with Sections II.A, II.B, II.C, and II.D of Appendix I to 10 CFR Part 50.

Based on the evaluation described below, the staff finds the designed liquid and gaseous radioactive waste systems and associated process and effluent radiological monitoring and sampling systems acceptable. The staff evaluation of the increased storage capacity for the solid waste system will be provided in a supplement to the SER prior to the licensing of Unit 2.

11.2 System Description and Evaluation

11.2.1 Liquid Waste Processing System

The liquid waste processing system (LWPS) for the Comanche Peak Station is shared between Units 1 and 2. The system consists of the process equipment and instrumentation necessary to collect, process, monitor, and recycle or dispose of radioactive liquid wastes. The liquid radwaste system is designed to collect and process wastes on the basis of their origin in the plant and their expected levels of radioactivity. All liquid waste is processed on a batch basis to permit optimum control of releases. Before processed liquid wastes are released, they are sampled and analyzed to determine the types and amounts of radioactivity present. On the basis of the results of the analysis, the waste is either recycled for eventual reuse in the plant, retained for further processing, or released to the environment under controlled conditions. A radiation monitor in the discharge line will automatically terminate the discharge of liquid waste if radiation measurements exceed a predetermined level.

The liquid radioactive waste processing system consists of the tritiated and nontritiated waste subsystems and a laundry and shower subsystem. A schematic diagram of the liquid waste processing system is given in Figure 11.1. The chemical and volume control system (CVCS) processes letdown from the primary

Based on its evaluation, the staff concludes that the gaseous waste processing systems for Comanche Peak Steam Electric Station, Units 1 and 2, are capable of maintaining releases of radioactive materials in gaseous effluents during normal operation (including anticipated operational occurrences), so that the calculated doses are less than the numerical design objectives of Sections II.B and C of Appendix I of 10 CFR Part 50. The staff evaluation also shows that the applicant's design of the gaseous waste treatment systems for Units 1 and 2 conforms to the numerical design objectives of RM 50-2, as specified in the option provided by the Commission's September 4, 1975 amendment to Appendix I of 10 CFR Part 50. Therefore, the systems meet the requirements of 10 CFR Part 50.

The staff concludes that the gaseous radwaste processing systems are capable of reducing radioactive materials in effluents to ALARA levels in accordance with 10 CFR Part 50.34a and are, therefore, acceptable.

11.2.3 Solid Radioactive Waste Treatment System

The solid waste system (SWS) for Comanche Peak is shared between Units 1 and 2, and it is designed to process two general types of solid wastes: "wet" solid wastes, which require solidification before they are shipped, and "dry" solid wastes, which require packaging and, in some cases, compaction, before they are shipped to a licensed burial facility. "Wet" solid wastes--consisting of boron recycle systems, floor drain and waste evaporator bottoms, spent resin from deep bed and filter/demineralizers, reverse osmosis concentrations, and chemical drain tank effluents--are preconditioned to meet the feed conditions required by the ATCOR-132A cement solidification system in 50 ft^3 containers for offsite shipment. The staff has not completed its review of the ATCOR-132A system under the topical report program. However, the staff finds that the applicant's reference to this topical report does not include preconditioning the waste, interfaces with the equipment, parameters for chemical and physical characteristics of waste, reverse osmosis concentrate feed applicability, and capacity; moreover, the process control program does not contain sampling or testing criteria to ensure solidification. Therefore, the applicant's program is unacceptable. Before Comanche Peak begins operation, the applicant will be required to submit a process control program that ensures complete solidification of all "wet" solid waste in conformance with the guidelines of SRP Section 11.4 (Revision 1) and Branch Technical Position Paper ETSB 11.3. This program also will be incorporated into the Technical Specifications for plant operation.

The principal radionuclides in the solid wastes are long-lived fission and corrosion products: Cs-134, Cs-137, Co-58, Co-60, Mn-54, and Fe-55.

"Dry" solid wastes--consisting mainly of ventilation air filters, contaminated clothing, paper, laboratory glassware, and tools--are compacted in 55-gal drums by a waste baler. The baler is equipped with a shroud to prevent the escape of radioactive materials during compaction. During the baling operation, air in the vicinity of the baler is exhausted by a fan through a HEPA filter to the auxiliary building ventilation system to reduce the potential for airborne radioactive dusts. Wastes are packaged in containers designed to meet the requirements of 49 CFR Parts 170-189. Shielding is provided to maintain acceptable contact dose rates to meet the provisions of 10 CFR Part 71.

The staff has evaluated the solid radwaste treatment for normal operation, including anticipated operational occurrences. The staff estimates that the volume and radioactivity level of solid waste shipped offsite will be 17,000 ft^3/yr/reactor of solidified wet waste, containing 22,000 Ci, and 4100 ft^3/yr/reactor of dry solid waste, containing no more than 5 Ci/reactor.

11.2.3.1 Conformance With Federal Regulations and Branch Technical Positions

The solid radwaste system is housed in the fuel building, which is designed to meet seismic Category I criteria, and, therefore, meets the guidance given in Regulatory Guide 1.143. Storage facilities for solid waste include an area in the fuel building for approximately 35 50-ft^3 containers and 50 55-gal drums.

Based on the staff's estimate of the expected solid waste volumes and the recommendation in SRP 11.4 that at least 30 days' storage capacity be provided for packaged solid radwaste from each unit, the staff finds that storage capacity adequate for meeting the demands of Comanche Peak Unit 1 during normal operation. In Amendment 22, the applicant committed to providing additional storage space prior to the licensing of Unit 2. On the basis of its evaluation of the solid radwaste system, the staff concludes that the system design cannot accommodate the radwastes expected during normal operations, including anticipated operational occurrences. The packaging and shipping of all wastes are in accordance with the applicable requirements of 10 CFR Parts 20 and 71 and 49 CFR Parts 170-178. From these findings the staff concludes that the solid radwaste system is acceptable; however, the staff will review the adequacy of the additional storage space for meeting the station's demands before the license for Unit 2 is issued. The results of the review will be reported on a supplement to this SER.

11.3 Process and Effluent Radiological Monitoring Systems

The process and effluent radiological monitoring systems are designed to (1) provide information concerning radioactivity levels in systems throughout the plant, (2) indicate radioactive leakage between systems, (3) monitor equipment performance, and (4) monitor and control radioactivity levels in plant discharges to the environment.

Table 11.6 provides the proposed locations of continuous monitors. Monitors on certain effluent-release lines will automatically terminate discharges if radiation levels exceed a predetermined value.

Systems which are not amenable to continuous monitoring, or for which detailed isotopic analyses are required, are periodically sampled and analyzed in the plant laboratory.

The staff has reviewed the locations and types of effluent and process monitoring provided. Based on the plant design and on continuous-monitoring and intermittent-sampling locations, the staff has concluded that all normal and potential release pathways are monitored. The staff has also determined that the sampling and monitoring provisions are adequate for detecting the leakage of radioactive material to normally uncontaminated systems and for monitoring plant processes which could affect radioactivity releases. On this

basis, the staff considers that the monitoring and sampling provisions meet the requirements of GDC 60, 63, and 64 and the guidelines of Regulatory Guide 1.21.

11.4 Evaluation Findings

In its evaluation, the staff calculated releases of radioactive materials in liquid and gaseous effluents for normal operation (including anticipated operational occurrences), based on expected radwaste inputs over the life of the plant. The staff determined that the applicant's proposed design of the liquid and gaseous waste treatment systems satisfies the design objectives of Appendix I to 10 CFR Part 50. The staff has concluded that the liquid and gaseous radwaste treatment systems will reduce radioactive materials in effluents to ALARA levels in accordance with 10 CFR Part 50.34a and, therefore, are acceptable.

The staff has considered the potential consequences of reactor operation with a 1% operating power fission product source term and has determined that, under these conditions, the concentrations of radioactive materials in liquid and gaseous effluents in unrestricted areas will be a small fraction of the limits specified in 10 CFR Part 20.

The staff has considered the capabilities of the radwaste systems to meet demands that result from anticipated operational occurrences and has concluded that the liquid and gaseous waste system capacities and design flexibilities are adequate to meet the anticipated needs of the plant.

The staff has reviewed the applicant's quality assurance provisions for the radwaste systems, the quality group classifications used for system components, the seismic design applied to the gaseous waste processing system, and the seismic classification applied to the design of structures housing the radwaste systems. The design of the radwaste systems and structures housing these systems meets the guidelines set forth in Regulatory Guide 1.143.

The staff has reviewed the provisions incorporated in the applicant's design to control the releases of radioactive materials in liquids as a result of inadvertent tank overflows and has concluded that the measures proposed by the applicant are consistent with the acceptance criteria set forth in Regulatory Guide 1.143.

The staff review of the radiological process and effluent monitoring system included the provisions for sampling and monitoring all normal and potential effluent discharge paths in conformance with GDC 64, for providing automatic termination of effluent releases and ensuring control of releases of radioactive materials in effluents in conformance with GDC 60 and Regulatory Guide 1.21, for sampling and monitoring plant waste process streams for process control in conformance with GDC 63, for conducting sampling and analytical programs in conformance with the guidelines in Regulatory Guide 1.21, and for monitoring process and effluent streams during postulated accidents. The review included piping and instrument diagrams and process flow diagrams for the liquid, gaseous, and solid radwaste systems and ventilation systems, and the location of monitoring points relative to effluent release points. The staff concluded that the applicant's radiological process and effluent monitoring systems are acceptable.

On the basis of the evaluations discussed above, the staff concludes that the design liquid and gaseous radwaste processing systems and monitoring systems are acceptable. The basis for acceptance has been conformance of the applicant's designs, design criteria, and design bases for these systems to the applicable regulations and guides referenced above, as well as to staff technical positions and industry standards.

Moreover, based on its evaluation of the solid radwaste processing system, the staff concludes that the designed system for "dry" waste is acceptable. For Unit 1 only, the storage capacity for packaged waste is adequate to meet the recommendation for an area to accommodate at least 30 days of storage. In addition, the staff finds that the applicant has not completed his process control program for solidification. Therefore, the staff will complete its evaluation for increased storage capacity of the solid waste processing system in a supplement to this SER prior to the licensing of Unit 2.

11 RADIOACTIVE WASTE MANAGEMENT

11.1 Summary Description

In the summary description of the SER the staff noted that it found the designed liquid and gaseous radioactive waste systems and associated process and effluent radiological monitoring and sampling systems acceptable, but that the staff's evaluation of the increased storage capacity for the solid waste system would be provided in a supplement to the SER prior to the licensing of Unit 2. This outstanding issue has been resolved as described in Section 11.2.3.1. Therefore, the staff now finds the designed liquid, gaseous and solid radioactive waste systems and associated process and effluent radiological monitoring and sampling systems acceptable.

11.2 System Description and Evaluation

11.2.3 Solid Radioactive Waste Treatment System

The staff stated in the SER that "wet" solid wastes -- consisting of boron recycle systems, floor drain and waste evaporator bottoms, spent resin from deep bed and filter/demineralizers, reverse osmosis concentrations, and chemical drain tank effluents - are preconditioned to meet the feed conditions required by the ATCOR-132A cement solidification system in 50 ft^3 containers for offsite shipment. The staff also noted it had not completed its review of the ATCOR-132 system under the topical report program. In a letter dated September 3, 1981, to Mr. Martin Brownstein (ATCOR) from Mr. Robert L. Tedesco (NRC) the staff found the ATCOR topical report to be acceptable.

11.2.3.1 Conformance with Federal Regulations and Branch Technical Positions

The staff described the storage facilities for solid waste as including an area in the fuel building for approximately 35 50-ft^3 containers and 50 55-gal drums. The staff found that this space is adequate for operation of Unit 1, but questioned the adequacy for the design to accommodate the radwastes expected during normal operations, including anticipated operational occurrences, with both units operational. In FSAR Amendment 26, the applicant advised that storage capacity for up to 74 50-ft^3 containers is provided in the drum storage area and storage capacity of at least 144 55-gal drums is provided in Area 247 in the fuel building. Based on this additional information, the staff estimates that the facility provides at least 30 days storage capacity for packaged solid radwaste for each unit, and therefore finds the storage capacity adequate to meet the demands of Comanche Peak Unit 1 and 2 during normal operation. The staff concludes the solid radwaste system is acceptable.

11.4 Evaluation Findings

The evaluation findings presented in the SER noted the staff's concern that the storage area for the packaged wet waste might be inadequate for the facility with both units operational. This outstanding issue was resolved as described in Section 11.2.3.1 of this supplement.

11 RADIOACTIVE WASTE MANAGEMENT

11.2 System Description and Evaluation

11.2.3 Solid Radioactive Waste Treatment System

The storage of solid radioactive waste is discussed in Section 11.4.2.7 of the CPSES FSAR. The amount of solid radioactive waste storage required is dependent upon the availability of waste disposal sites while the plant is operating. If waste disposal sites are not available, more storage may be required to continue operation. The available storage is considered adequate to license CPSES Units 1 and 2. Design changes to provide additional storage, if needed to continue operation, will be evaluated when submitted by the licensee. The outstanding issue of storage capacity for the solid radwaste system for CPSES Unit 2 is, therefore, considered closed.

11.2.3 Solid Radioactive Waste Treatment System

SPLB 5. The FSAR has revised the discussion of solid waste management. (77)

Index Page for Bullets

11.2.3 SPLB	Solid Radioactive Waste Treatment System 5. The FSAR has revised the discussion of solid waste management.	(77)

11.4-2

2 Deletes the statement which indicated that spent filter cartridges are expected to be changed once every two years.
Update:
This change is made since industry experience indicates that filter changeout (based on pressure drop or radiation measurements, as is planned for use at CPSES) should occur sooner than every two years.
FSAR Change Request Number: 89-475.06
Related SER Section: 11.2.3
SER/SSER Impact: No

11.4-3, 4

2 Modifies the text to describe an alternate method for spent filter cartridge removal and transfer.
Update:
This change is made to provide an alternate means that could be used if the radiation levels from the spent filter cartridge are sufficiently low.
FSAR Change Request Number: 89-475.07
Related SER Section: 11.2.3
SER/SSER Impact: No

11.4-7

3 Completely replaces the text of subsection 1 with a description of certain aspects of Rev. 0 of the TU Electric Process Control Program.
Addition:
This change is made to reflect the applicable requirements of Rev. 0 of the TU Electric Process Control Program.
FSAR Change Request Number: 89-475.11
Related SER Section: 11.2.3
SER/SSER Impact: Yes
SER Section 11.2.3 should be revised to reflect the fact that TU Electric submitted Rev. 0 of its Process Control Program (with letter TXX-89196, dated April 17 1989) which does assure solidification of "wet" solid waste.

11.4-8

2 Deletes the statement, in the subsection "Packaging", indicating that there is no danger of radioactive spills caused by dropping of containers because the contents are solid.
Correction:
This change reflects the commitment in Rev. 0 of the TU Electric Process Control Program that radioactive waste sent offsite for burial will be processed by dewatering.
FSAR Change Request Number: 89-475.12
Related SER Section: 11.2.3
SER/SSER Impact: No

11.4-8

3 Deletes the statement, in the subsection on "Storage", which indicated that storage capacity for 50 cu. ft. containers is provided in the Drum Storage Area.
Correction:
This change reflects the fact that these containers will no longer be stored in the Drum Storage Area since other waste management system equipment is now located there.

FSAR Change Request Number: 89-475.13
Related SER Section: 11.2.3.1; SSER1 11.2.3.1
SER/SSER Impact: Yes
Section 11.2.3.1 of SSER No. 1 should be revised to reflect the fact that the Drum Storage Area will not be used for storage of waste containers.

11.4-8

3 Adds a sentence, in the subsection on "Storage", indicating that additional waste container storage capacity is available (in order to replace what was lost in the Drum Storage Area).
Addition:
This change is made to reflect the fact that wastes may also be stored outside the Fuel Building.
FSAR Change Request Number: 89-475.14
Related SER Section: 11.2.3.1; SSER1 11.2.3.1
SER/SSER Impact: Yes
Section 11.2.3.1 should be further revised to reflect the fact that storage of waste containers will also be accomodated outside the Fuel Building in order to provide for at least a 30 day capacity.

clothing, rags, towels, floor coverings, shoe covers, plastics, cloth smears, and respirator filters in 55-gal drums. These wastes are products of plant operation and maintenance.

54 |

11.4.1.2 Design Criteria

46 | The input to the SWMS is from various sources. The incompressible solids ~~and liquids~~ are packaged in disposable containers while the compressible solid wastes are collected and compressed (baled) into
46 | drums **or sent offsite for vendor processing**. The various sources, quantities, and activity levels are detailed in Table 11.4-1. Maximum volumes may be produced as a result of excessive equipment leakage, steam generator tube leakage, and so forth. ~~Spent filter cartridges are expected to be changed once every two years.~~

The principal nuclides shipped from the plantsite include the following:

Iodine-131	Iron-59
Cesium-134	Manganese-54
Cesium-136	Manganese-56
Cesium-137	Molybdenum-99
Cobalt-58	Strontium-89
Cobalt-60	Strontium-90
Iron-55	Chromium-51
Hydrogen-3	

The seismic design classification of the Fuel Building housing the SWMS is discussed in Section 3.2. The seismic design and equipment design codes for the RWSS components and piping are in accordance with
29 | ETSB Technical position 11-1. See Appendix 17A.

11.4.2 SYSTEM DESCRIPTION

11.4.2.1 Solidification System Description

The ATCOR System is as described in ATCOR topical report ATC-132A. Only those components necessary for the collection and conditioning of the various waste streams prior to discharge via the bulk disposal connections on elevation 810' of the Fuel Building are utilized. | 54

The major ATCOR system components which are utilized include the Waste Conditioning Tank, Waste Feeder Pumps, Emergency Waste Return Pump, Powdex Transfer Pump, Chemical Addition Tank and their associated valves, piping and controls. | 54

11.4.2.2 Spent Filter Cartridge Assembly Processing

Transfer of expended filter cartridge assemblies from the filter housing to the waste processing ~~solidification~~ area may be ~~is~~ accomplished by means of a filter transfer cask. ~~Shipping shield and flat bed cart.~~ The transfer cask is positioned next to the compartment of the filter to be replaced. The compartment shielding plug is removed and placed outside of the work area. The filter housing head bolts are disengaged and the head swung out of the way to allow access for the transfer cask. The base of the cask is removed and the cask positioned concentrically above the filter housing. The cask hoist grapple is lowered to engage the filter cartridge assembly and the cartridge raised into the shielded cavity. The base of the transfer cask is replaced, then the cask is moved by monorail to the filter drop zone hatchway where it is lowered into the Fuel Building. An alternate method is to use this hoist to remove the filter and lower it to the Fuel Building; however, a shielded container is employed rather than the filter transfer cask while transporting the filter. The method to be used is predicated on the filter dose rate. | 50

Filters may be processed on site to comply with state, federal and burial site transportation and disposal regulations or they may be shipped to a vendor for offsite processing. ~~In the Fuel Building, the transfer cask is placed on the flat bed cart and moved to the waste solidification area. The transfer cask is removed from its base and~~

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lowered into the shipping shield with a liner in place. The cartridge is lowered into the liner, and the transfer cask returned to the flat bed cart where the base is reattached. The transfer cask is then taken back to the filter compartment area. Filters are stored in the shipping shield until the liner is full. The liner is then processed for offsite shipment.

46 handling of the filled containers. The shields have a lead core with inner and outer shells of steel and are designed to accommodate disposable containers. Lifting devices are permanently attached to the shields and are capable of supporting 1-1/2 times the weight of the loaded shipping shield. *Shields of the 6/1M/ thick size are provided for implant use only/*

4 3. Filter Transfer Cask

Q320.8

4 One filter transfer cask is provided to be used as a shielding and carrier vehicle to protect personnel from radiation exposure while transferring spent filter cartridges from the filter housing to the **waste processing** *drumming* area. Movement of the filter transfer cask is by a monorail. The cask is provided with a removable drip pan to collect any dripping liquid from the filter cartridges. The cask is designed with a stainless steel interior and flush connections located on the top of the cask to facilitate washdown and decontamination. The grapple assembly that is used to lift the filter cartridge is permanently attached to the inside of the cask. The grapple has a fail-safe feature which locks the filter in place in the event of power failure.

4 4. Flat-Bed Cart

Q320.8

4 One rail-mounted flat-bed cart is provided to transport disposable containers with shipping shields *between the Hatchway (for filter cartridges)/ the drumming/ and the loading areas.* The cart has three individual drive systems: continuous forward and reverse, creep forward and reverse, and manual emergency override.

5. Baler

Q320.8

The baler is a commercially available assembly used in conjunction with standard 55-gal drums which receive the low radiation level, solid, compressible wastes. Compaction of the wastes is performed after an amount of waste sufficient to fill a drum has been accumulated. 4

11.4.2.6 Other Design Features

1. Process Control Program 54

Waste processing is performed by a mobile processing vendor. The TU Electric Process Control Program requires that the vendor operate in accordance with a process control program and procedures which have been reviewed and approved by TU Electric. Additionally, any vendor selected to provide services or products used to achieve the 10 CFR 61 stability requirements shall have a topical report for that purpose either under review or already approved by the NRC.

All solidifications are performed by a mobile solidification vendor in accordance with an approved process control program. This process control program meets the waste form criteria of the Branch Technical Position to 10CFR61. 54

2. Overflow of Tanks

The waste conditioning tank is provided with an ultrasonic level sensing device which provides level indication over the range of tank operating levels. In addition, level detectors are provided which provide interlock inputs for waste conditioning tank high and low levels. The high level interlock stops waste stream addition to the waste conditioning tank while the low level interlock stops the tank agitator. 54

3. Tanks Using Compressed Gases

Compressed gas is not directly used in any SWMS tank. However, the waste conditioning tank is vented to the plant ventilation 54

54 for transferring one batch is estimated to be 1200 scf at 50 scfm. The expected radionuclide concentration of the vent gases will be negligible. The treatment provided (atmospheric cleanup system) for the vent gases is described in Section 9.4.

54 11.4.2.7 Packaging, Storage, and Shipment

54

54 1. Packaging

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54 The SWMS product is a burial package which is classified as a normal form of packaged hazardous material in accordance with 49 CFR Part 173. A NRC permit for each container is not required, since most containers are shipped LSA, Type A. For greater

54 quantities, a lead shielding or overpack is used which has a NRC permit. *The contents in the containers are solid; therefore, there is no danger of radioactive spills caused by dropping of containers.*

2. Storage

26 *Storage capacity for up to seventy-four 50 ft^3 containers is provided in the Drum Storage Area shown in figure 1.2-38.* Capacity for storage of at least one hundred forty-four 55-gallon drums is provided in Area 247 in the Fuel Building (see Figure 1.2-38). **Wastes may also be stored outside the Fuel Building.**

Q320.8

36 *Adequate shielding is supplied to reduce exposure to personnel outside the drumming station to less than 25 mrem/hr. The*

4 *locations of the solidification room and the drum storage area within the plant are shown on the general arrangement drawing, Figure 1.2-38.* Storage time is a variable and depends on shipment schedules **and disposal site availability which the** *operating facility has contracted.* Radioactive decay, as a function of the storage interval, is considered to be minimal, and credit for the decay is not taken during shielding calculations.