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Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
Office of Nuclear Reactor Regulations
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Schwencer:

River Bend Station-Units 1 & 2
Docket Nos. 50-458/50-459

Please find enclosed Gulf States Utilities Company's response to review question E460.1 of our River Bend Station (RBS) Environmental Report-Operating License Stage (ER-OLS). This response will be incorporated into the ER-OLS by a future supplement. Forty copies of this information are enclosed according to Generic Letter No. 82-14.

Sincerely,

William J. Lee Jr.
for J. E. Booker
Manager-Engineering
Nuclear Fuels & Licensing
River Bend Nuclear Group

JEB/JWC/kt

Enclosures

A001
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3.5 RADIOACTIVE WASTE MANAGEMENT SYSTEMS

3.5.1 Source Terms

The radioactive waste systems collect, treat, and dispose of anticipated and potential radioactive wastes in a controlled and safe manner. The radioactive inputs to the waste systems are due to:

1. Fission products resulting from perforation in the fuel cladding or tramp uranium on the surface of the fuel rods contaminating the reactor coolant system.

2. Activation products resulting from irradiation of the reactor water and impurities therein (principally metallic corrosion products) and corrosion of activated fuel components, reactor internals, and other materials exposed to the reactor neutron flux.

Radioactive wastes resulting from plant operation are classified as solid, liquid, and gaseous and are handled as shown in the following figures:

1. Fig. 3.5-1 (Solid Waste Management System)

2. Fig. 3.5-2 (Radioactive Liquid Waste System)

3. Fig. 3.5-3 (Off Gas System)

The radioactive waste systems utilize operating procedures to ensure that radioactive wastes are safely processed. Discharges from the plant are within the limits in 10CFR20 and result in doses that are within the guidelines of 10CFR50, Appendix I.

Table 3.5-1 lists the expected concentrations of radionuclides in reactor water and steam at a noble gas release rate of 50,000 uCi/sec after 30-min decay. Table 3.5-2 lists the assumptions used in calculating the expected annual releases of radioactive liquid and gaseous effluents.

3.5.2 Radioactive Solid Waste System

The objective of the radioactive solid waste system is to collect, process, package, and provide temporary storage facilities for solid wastes from both Units 1 and 2. This system is located in the radwaste building.

River Bend currently has a contract in force with Chem-Nuclear Systems, Inc. (CNSI), to perform solidification of wet waste by use of portable solidification equipment (refer to Topical Report CNSI (4313-01354-OIP-A) for details). These wastes are packaged in shipping containers as a homogeneous, immobile mix, and dry compressible wastes are compacted prior to shipment for offsite disposal. Miscellaneous dry wastes are appropriately packaged in DOT and NRC approved packages for offsite shipment. The system is designed to provide processing, packaging, and temporary storage resulting from normal station operations for both units so that operation and availability of neither unit is limited.

In addition, the system design:

1. Includes equipment and instrumentation to utilize administrative controls such that the solid radioactive wastes collected and prepared for offsite shipment do not result in radiation exposures to unit personnel in excess of the limits set in 10CFR20 and

2. Utilizes, where necessary, shielded casks which conform to 10CFR71 Packaging of Radioactive Material for Transportation and Department of Transportation (DOT) regulation 49CFR173, Sections 389 through 395.

3.5.2.1 Sources of Solid Waste

The wet solidification system accepts sludges from the phase separator and backwash tanks in the liquid waste system. These wastes consist of spent resin beads, resin fines, and filter sludges in varying proportions as described in Section 3.5.3.

Miscellaneous dry radioactive materials, e.g., paper, rags, contaminated clothing, gloves, shoe covers, etc, are compacted in a hydraulic press. Contaminated metallic materials and incompressible solid objects such as small tools, equipment, control rods and fuel channels, etc, are handled on a case-by-case basis.

Table 3.5-3 provides expected solid radwaste system inputs and waste volumes to be shipped offsite based on average data from operating BWRs. The table also gives expected radioactivity levels in the packaged containers.

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3.5.2.2 Description of Solids Processing Procedure 1.10

3.5.2.2.1 Process Materials 1.11

Wastes consisting of spent resin beads, resin fines, and filter sludges from the liquid waste system (Section 3.5.3) are collected in the waste sludge tank. The solids are mixed for uniform dispersion of activity, analyzed, and transferred to the portable solidification system. Waste dewatering and chemical conditioning operations are performed by the contractor. Details of the contractor's subsystem for processing wet solid wastes are provided in the contractor's topical report. 7

Solid wastes such as paper, air filters, rags, etc, are compressed into 55 gallon drums to reduce their volume for shipment. Noncompressible wastes are packaged manually in appropriate containers and are solidified with wet waste.

3.5.2.2.2 Irradiated Reactor Components 1.27

Irradiated reactor components will be handled as a special case. Control rods, fuel channels, and other high level radioactive waste will be handled remotely. Handling of such equipment will depend on radiation level, transportation facilities, and available storage sites.

3.5.2.3 Description of Equipment

The solid waste system contains the following components:

a. a waste sludge tank,

b. a waste sludge pump,

c. an overhead bridge crane, and

d. a waste compactor.

7 The waste sludge tank provides temporary storage and mixing capabilities for wastes prior to solidification. Level and temperature indicators and high/low level alarms are provided. The waste sludge pump transports the waste slurry to the contractor's solidification system at a controlled rate. It is automatically shut off at waste sludge tank low level, and recirculates waste when high discharge pressure or low flow is indicated. The overhead bridge crane facilitates movement of filled solidification liners to the waste storage area, and then to the shipping area. It will also move empty containers to the fill area.

3.5.2.4 Performance Analysis

All solid radwaste material will be packaged in approved shipping containers meeting the regulations of 10CFR71 and 7 DOT Regulation 49CFR173 Sections 389 through 395.

The design and utilization of containers for shipping will meet the regulations for Transportation of Radioactive Materials found in 49CFR171-175, 177, and 178.

7 Wet solid waste is packaged with remote handling equipment due to its high radioactivity. This waste consists of filter sludges, reactor water cleanup sludge, and spent ion exchange resins.

7 The activity of most other solid wastes will be low enough to permit handling of the packages by contact. These wastes will be collected in containers located in appropriate zones around the station as dictated by the volumes of wastes generated during operation and maintenance. All containers will be monitored periodically during filling.

There are no outside radwaste storage areas at River Bend Station. Ventilation will be provided to maintain control of contaminated particles when operating packaging

equipment. Packaged wastes will be shipped to an approved offsite facility for storage or burial.

Equipment too large to be handled in this way will be handled as a special case at the time depending on the radiation level, transportation facilities, and available storage sites.

Approximately 35 solidified waste liners can be stored in the shielded storage area located near the liner fill area. Based on solidifying approximately 138 cu ft of wet waste per liner (liner total volume is 195 cu ft), a normal anticipated generation of 12,400 cu ft/yr of solidified waste (90 filled liners), the radwaste storage area can provide post-solidification storage capabilities of more than 3 months.

The low level storage area houses approximately 110 drums of compacted dry waste. This is equivalent to storage capacity of over one month for compressible wastes.

Shipments of radioactive solid waste will be made by licensed carriers using either rail or truck transport. Radioactive waste is shipped in "Exclusive Use" vehicles. Outside areas with controlled access will be designated for trucks or rail cars containing radioactive waste material prior to shipment.

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3.5.3 Radioactive Liquid Waste System

The liquid radioactive waste subsystems collect, monitor, and process for re-use or disposal all liquids received from the reactor coolant system or liquids which can become contaminated from contact with the reactor coolant system liquids for both Units 1 and 2. 7

3.5.3.1 Sources of Radioactive Liquid

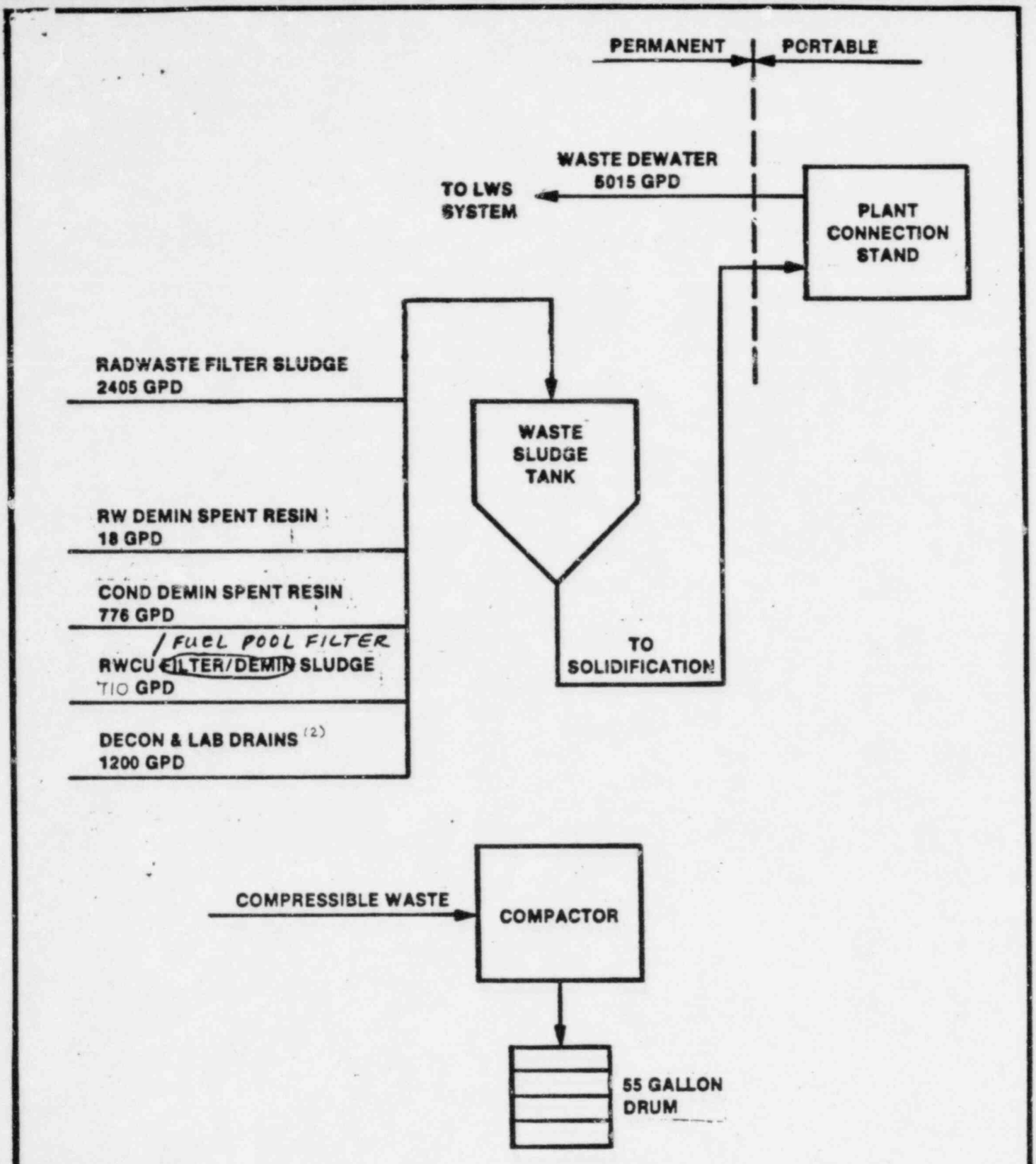
Table 3.5-4 identifies the sources of input to the radwaste system. The system is capable of processing these quantities and activities of liquid wastes which result from normal operation and maintenance. Furthermore, the system is capable of processing the maximum daily input from all sources within 24 hr. It processes the liquid waste so that a majority of the recovered water is re-used, and the waste effluent discharged from the station is within the 10CFR20 limits and results in doses that are within the guidelines of 10CFR50, Appendix I.

3.5.3.2 System Description

The system is divided into one minor and one major subsystem so that the liquid wastes from various sources can be segregated and processed separately. The segregation is done according to the liquid conductivity and/or radioactivity. All collection tanks, pumps, and processing equipment is located in the radwaste building. Major flow paths, equipment data, leakage, and drainage are indicated on Fig. 3.5-2. Refer to Table 3.5-4 for a summary of design parameters for the liquid radioactive waste systems. 7

3.5.3.2.1 Waste and Floor Drain Collector Subsystem

Wastes entering the waste collector subsystem have variable activity levels depending on their source and relatively low conductivity (less than 50 umho/cm). There are four waste collector tanks to receive liquid waste from designated systems within both units. Radioactive materials are removed from these wastes by filtration (insolubles and oil removal) and ion exchange (soluble and colloidal removal). 7



NOTES:

1. FLOW RATES INCLUDE TRANSFER WATER AND SOLIDS.
2. DOES NOT CONTRIBUTE TO SOLID WASTE INVENTORY.

FIGURE 3.5-1

SOLID WASTE MANAGEMENT SYSTEM

RIVER BEND STATION
ENVIRONMENTAL REPORT – OLS

TABLE 3.5-3

SOLID WASTE VOLUMES AND ACTIVITIES
COMBINED WASTES - UNITS 1 AND 2

SOLID WASTE STREAM	EXPECTED VOLUME(1)(2) (FT^3/YR)	EXPECTED SPECIFIED ACTIVITY (μCi/cc)	EXPECTED CURIE CONTENT (Ci/YR)
RADWASTE FILTER SLUDGE	1,080	0.690	21.1
FUEL POOL/RWCU SLUDGE	720	53.9	1098
RADWASTE DEMIN SPENT RESIN	2,600	5.59	411
CONDENSATE DEMIN SPENT RESIN	13,600	6.75	2598
COMPACTIBLE DRY SOLID WASTE	7,316	2.4 - 02(3)	4.88
NONCOMPACTIBLE DRY SOLID WASTE	3,471	3.79	372

Notes: (1) SOLIDIFIED WASTE VOLUME

(2) BASED ON 365 DAYS OPERATION PER YEAR

(3) VALUE NOTED AS 2.4-02 IS IN POWER OF 10 NOTATION AND IS EQUIVALENT TO 2.4×10^{-2}