Metropolitan Edison Company
Post Office Box 480
Middletown, Pennsylvania 17057
717 944-4041

Writer's Direct Dial Number

October 16, 1980
TLL 542

TMI Program Office
Attn: Mr. John T. Collins, Deputy Program Director
U. S. Nuclear Regulatory Commission
c/o Three Mile Island Nuclear Station
Middletown, Pennsylvania 17057

Dear Sir:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Submerged Demineralizer System
System Description

This letter documents that three (3) copies of the subject document have been supplied to Mr. Joel S. Wiebe of the TMI Program Office.

Sincerely,

/s/ J. J. Barton (for)

G. K. Hovey
Vice-President and
Director, TMI-2

GKH:LJL:dad

cc: Bernard J. Snyder

A001
S. 1/1

8010210507

P

Revision 1
10/3/80

THREE MILE ISLAND - UNIT #2

SYSTEM DESCRIPTION

OF THE

SUBMERGED DEMINERALIZATION SYSTEM

(SDS)

REVISION RECORD

SUBMERGED DEMINERALIZATION SYSTEM

Rev.	Date	Project Manager Approval	Rev	Date	Project Manager Approval
0	8/15/80				
1	10/3/80				

TABLE OF CONTENTS

FOR THE

SUBMERGED DEMINERALIZATION SYSTEM

SYSTEM DESCRIPTION

ARTICLE		PAGE
1.0	INTRODUCTION	1
1.1	System Functions	1
1.2	Summary Description of the System	2
1.3	System Design Requirements	8
2.0	DETAILED DESCRIPTION OF THE SYSTEM	17
2.1	Components	17
2.2	Instruments, Controls, Alarms and Protective Devices	53
3.0	PRINCIPLE MODES OF OPERATION	55
3.1	Ventilation System	55
3.2	Feed Tank Filling Operation	57
3.3	Processing the Filtered Water	58
3.4	Special Evolutions	60
3.5	Emergencies	61
4.0	HAZARDS AND PRECAUTIONS	63

APPENDICES

TITLE	TABLE	PAGE
SDS Pumps	1	64
SDS Filter Vessels	2	71
SDS Demineralizer Vessels	3	72
Waste Storage Tanks	4	74
SDS Monitor Tanks	5	75
SDS Off Gas Separator Tank	6	76
Instrumentation and Control		77

1.0 INTRODUCTION

1.1 System Functions

The functions of the Submerged Demineralization System are:

a. To decontaminate, by filtration and demineralization, the contaminated waters contained in the Reactor Containment Building and the Primary Coolant System at Three Mile Island - Unit #2.

b. To transfer the decontaminated waste water from the Submerged Demineralization System monitoring tanks to TMI storage tanks.

c. To provide for the underwater loading of the spent vessels into their transport casks, and the storage, decontamination, and preparation for shipment of these casks.

d. To limit releases of radioactive material to the environment to "As Low As Reasonably Achievable."

e. To provide for the installation, testing, operation, maintenance, and decommissioning of the Submerged Demineralization System in compliance with "As Low As Reasonably Achievable" radiation doses to personnel.

f. To filter gases resulting from the processing of RCS water and containment sump water prior to venting these gases into the existing Fuel Building Ventilation System.

g. To accomplish the above independently from TMI Unit #1.

1.2 Summary Description of the System

The Submerged Demineralization System is a Liquid Radwaste Process System located in the Unit 2, "B" spent fuel pool. The system is designed to decontaminate, by filtration and ion exchange, the radioactive waste water contained in the Unit #2 Reactor Containment Building sump and the Unit #2 Reactor Coolant System.

Contaminated water will be pumped from the Reactor Containment Building sump using the Reactor Building waste pump (WG-P-1A) located in the Auxiliary Building. The water will be pumped through two mechanical filters and then into the four 15,000 gallon waste storage tanks (WG-T-2A through 2D) located in "A" spent fuel pool. A submersible pump, located in the waste storage tank standpipe. (WG-U-2), will take a suction on the tanks and pump the waste water through the SDS System. Most of the system components are located underwater, as a means of shielding the high levels of radioactivity. Those components not shielded by water utilize standard lead shielding techniques to accomplish radiation exposure control.

The Initial Filtration System consists of two mechanical filters arranged in series. The first filter (prefilter) is a roughing filter designed to remove suspended solids greater than 125 microns in size. The second filter (final filter) removes particles greater than 10 microns in size.

The filters are located in the spent fuel pool, underwater. They will be equipped with Hansen quick disconnects for ease of replacement as they become loaded.

After the water is filtered, it is stored in the four (4) 15,000 gallon storage tanks (WG-T-2A thru 2D) until it is processed. The tanks are vented to the SDS Off Gas System and are emptied through a 12" standpipe (WG-U-2). There is no valving between the tanks and they are considered as one tank, therefore a single volume of 60,000 gallons.

Upon completion of the waste storage tank fill operation, a submersible pump, located in the 12" standpipe (WG-U-2) will take a suction on the storage tanks and pump the water through the submerged ion exchange manifold, and to the polishing unit demineralizer. The submerged ion exchange manifold directs the water through one or two parallel trains of zeolite beds and then through one of two cation beds. Each train of zeolite consists of three (3) zeolite beds (each containing 8 cubic ft.) arranged in series. The beds are submerged in the spent fuel pool and equipped with Hansen quick disconnect fittings for ease of replacement as they become loaded. The effluent of the zeolite beds passes through a seven (7) cubic foot cation bed, also submerged in the pool and equipped with Hansen quick disconnects. There are two (2) cation beds arranged in parallel, however, only one bed will be in service at any one time.

A polishing unit, on the effluent side of the cation beds, is located on the cask support platform, at the south end of the pool, above the surface of the water. The polishing unit consist of: an automatic influent isolation valve and piping manifold, a demineralizer fillhead assembly, a 195 cubic foot polishing demineralizer, two air driven pumps, and a remote alarm, monitor, and control panel.

The processed water is then temporarily stored in two (2), indepedent 12,000 gallon monitor tanks. The tanks can be recirculated and sampled using the effluent pumps. Depending on the sample results, the effluent pumps can direct the tank effluent to the 12" standpipe (WG-U-2) for reprocessing to the influent of the polishing unit for repolishing, or to the TMI processed water storage tanks. In addition, the processed water can be utilized as flush water within the SDS system.

Throughout the system there are numerous sample points. Frequent sampling during processing allows the operator to evaluate system performance and to determine when components require maintenance or replacement.

System components which have ventilation or drainage requirements are tied into a Vent and Drain System. The system consists of a moisture separator tank, a separator tank bottoms pump, various air filters, and an off gas blower assembly. Any liquid generated by venting or leakage is collected in the moisture separator tank where it

is pumped back into the 12" standpipe (WG-U-2). Ventilation exhausts from the various tanks and components are filtered in the Vent and Drain System off gas header and the moisture separator tank drawn through a heater, roughing filter and two HEPA filters. The air is then exhausted into the Fuel Building Ventilation System using a 1000 cfm blower, where it is further processed by the existing Plant Filtration System and eventually released via the TMI stack.

A Leakage Containment System is used to prevent the spent fuel pool from becoming grossly contaminated due to leakage from SDS components. The prefilter and final filter, the zeolite beds, and the cation beds, when submerged and installed in the system, are housed in a partially enclosed secondary containment. The top of the containments are slotted to allow an inflow of pool water. A pump takes a suction on the bottom of all secondary containments and discharges the pool water and any leakage from the quick disconnects or vessels to one of two leakage containment ion exchange beds. The effluent of the beds is returned to the cask handling area of the spent fuel pool.

Normal operation of the system will be by remote means. Most valves and quick disconnects will be operated remotely using mechanical linkages or tools. Cask loading and storage will be done underwater (in order to take advantage of the shielding) by Fuel Building overhead crane. Vessel lifting toools used by the overhead crane are designed to prevent the vessels from being lifted clear of the water, which would result in high radiation doses to operating personnel. All high level radioactive waste piping located above water will be shielded to minimize personnel exposures.

As previously mentioned, the SDS is also designed to be utilized in the clean-up of the Reactor Coolant System (RCS). An RCS clean-up manifold was developed to incorporate the necessary modifications to the SDS to allow for reactor coolant processing.

Reactor coolant will be directed to the RCS clean-up manifold through a one inch line coming from a tie-in connection in the TMI Unit #2 Mini-Decay Heat Removal System. The RCS clean-up manifold directs the reactor coolant to a tie-in in the SDS filter manifold influent line. The coolant passes through the SDS filters, back to the filter manifold and is returned to the RCS clean-up manifold via the filter manifold effluent line.

The filtered reactor coolant is directed from the RCS clean-up manifold to the SDS submerged ion exchange manifold, through the zeolite and cation beds, and back to the submerged ion exchange manifold.

Normally, effluent from the submerged ion exchange manifold is directed to the polishing unit. When the SDS is being utilized to process reactor coolant, the effluent from the ion exchange manifold can be valved into the RCS clean-up manifold then back into the Mini-Decay Heat Removal System, bypassing the polishing unit.

Initially, the reactor coolant flow through the SDS, will be limited to 10 gpm with both zeolite trains operating in parallel and 5 gpm when only one of the zeolite trains is in service. These relatively low flow rates are due to the low cross-sectional flow required to obtain a good decontamination factor while using zeolite. However, as the overall activity level

of the RCS decreases, it might be feasible to use organic resin instead of zeolite. This may allow SDS flow rate to be increased by 20 gpm, reducing the time required for Reactor Coolant System decontamination.

1.3 SYSTEM DESIGN REQUIREMENTS

1.3.1 Process System Design Requirements

1.3.1.1 The process line pipe size is nominally 1" schedule 40, based on the Submerged Demineralization System flow rate of 5 to 10 gpm. Other line sizes are based on service requirements and function, such as service air and flushing water, sampling, ventilation, and drainage lines.

1.3.1.2 System process piping is welded stainless steel. Instrument tubing systems are 304 S.S. Most instruments are not capable of being isolated from the system, as they are designed to be maintenance free for the life of the system.

1.3.1.3 Process instrumentation consists of; pressure instruments, differential pressure instruments, radiation detectors, flow detectors, temperature elements, level detectors, and a conductivity element.

1.3.1.4 Pressure instruments are equipped with liquid filled diaphragm capsules and capilliary tubes to prevent internal contamination of the pressure instruments. This arrangement aids in limiting the amount of piping outside of containments which is subjected to radioactive liquids and allows for removal during calibration or maintenance.

1.3.1.5 Due to the possibility of gross area contamination from minor valve leakage, most system valves are enclosed in manifold containments. These containments are sealed and have provisions for drainage. All of the containments are maintained under a slight negative pressure using the SDS Vent and Drain System. The manifolds are also shielded to minimize radiation exposure to operating personnel.

1.3.1.6 Piping runs outside of containments, which are not submerged underwater and are subjected to high level waste, will be shielded in order to minimize exposure to the operators.

1.3.1.7 Valves within containments are operated from outside of the containment using mechanical linkages. For the purpose of valve maintenance, an access hole, approximately 6" in diameter, is provided for each valve. A square lead block is used to cover the hole when access is not required.

1.3.1.8 SDS flushing and service air lines are provided with check valves in order to minimize the possibility of contaminating in plant service air or water systems.

1.3.1.9 Flushing and service air connections are provided at the following points in the system; filtration manifold, feed pump discharge manifold, zeolite trains, cation ion exchangers, polishing unit, the Leakage Containment System, and the RCS manifold.

1.3.1.10 Flush water, for use in the Submerged Demineralizer System, can be supplied from the TMI Unit #2 demineralized water header or processed water from the SDS monitoring tanks can be used.

1.3.1.11 Filtration and ion exchange vessels are equipped with inlet, outlet, and vent connections that are equipped with Hansen quick disconnect fittings to allow for remote underwater handling. A three (3) inch access connection with a plugged valveless Hansen connector is also provided for future use and filling purposes.

1.3.1.12 Pumps CN-P-IX01 (Feed Pump) and CN-P-VA04 (Separator Tank Bottoms Pump) are the only two pumps subjected to high level radioactive water. Both of these pumps are submersible type pumps and are located in standpipes. Because of their location, the problem of possible contamination from pump leakage around glands or seals need not be considered. The other pumps in the SDS are mechanically sealed pumps and are only subjected to low level waste or pool water, therefore contamination from leakage of these pumps will not be considered.

1.3.1.13 An auto isolation valve (WG-AV-02) is located on the inlet to the four (4) 15,000 gallon waste storage tanks (WG-T-2A thru 2D) and isolates the tanks on a high tank liquid level.

1.3.1.14 An automatic isolation valve, (CN-V-IX-24) located on the influent line to the submerged ion exchange manifold, senses several different parameters, any of which will cause the valve to shut. Several different process line radiation monitors, an area radiation monitor or a pressure switch on the off gas header will cause this valve to shut after a predetermined time delay of up to thirty minutes. Shutting this valve stops the treatment of the waste water, by isolating inlet flow to the ion exchange manifold.

1.3.1.15 There is an automatic isolation valve on the inlet line of the polishing unit. A Hi Hi level in the polishing demineralizer, a Hi influent waste temperature, or a Hi influent waste pressure will cause this valve to shut after a predetermined time delay isolating influent flow to the polishing unit.

1.3.1.16 A high level in one of the SDS monitor tanks will shut the automatic inlet isolation valve associated with the full tank.

1.3.1.17 Due to the small clearances inside of a Hansen quick disconnect, the internals of the prefilter inlet quick disconnect (both male and female) have been removed to prevent line blockage caused by the unfiltered waste water. A remote operated diaphragm valve is installed just upstream of the female side of this quick disconnect, to prevent the draining of the influent line while it is disconnected.

1.3.1.18 Level indication of the waste storage tanks (WG-T-2A thru 2D) actuates two automatic functions; a high tank level causes the influent line isolation valve to shut, preventing the tanks from overfilling, and a low level in the standpipe (not necessarily the waste storage tanks), causes the SDS feed pump (CN-P-IX01) to shut off, preventing damage to the pump.

1.3.1.19 A recirculation line and orifice are provided on the SDS feed pump discharge line upstream of the pump discharge throttle valve. The recirculated water is directed back into the 12" standpipe (WG-U-2). The recirculation line prevents the pump from operating at a shut off head.

1.3.1.20 The polishing unit is a skid mounted, portable piping manifold that is provided with a remote alarm, indication, and control panel. The purposes of the panel are to allow the operator to control the unit from one location after it is operating, and to allow the operator to monitor several important parameters simultaneously from one location.

1.3.1.21 Component operational evaluation is largely accomplished by radiochemical analysis. Numerous sample points are therefore necessary throughout the system. Sample points are provided on the influent and effluent of the prefilter and final filter, influent of the submerged ion exchange manifold, the effluent of each zeolite bed, the influent and effluent of the cation beds, the influent and effluent of the polishing unit demineralizer, the influent and effluent of the leakage containment ion exchangers, and the effluent of the monitor tanks. Provisions for sample line recirculation are provided in most cases. Most of the sample waste is directed to the off gas separator tank.

1.3.1.22 Due to possibility of gross contamination developing within the spent fuel pool, (due to SDS leakage, or vessel change-out) a Leakage Containment System is provided around all filters and ion exchange vessels except the pool purification I.X. vessels. The system is designed to collect and purify any amount of leakage from the Hansen quick disconnects, and at the same time to recirculate and purify the spent fuel pool water.

1.3.1.23 Because of the relatively low flow rate of the Submerged Demineralization System, stratification of the monitor tank contents is a possibility. To insure a representative sample of the tanks is obtained, prior to transfer of the water, a Recirculation System is installed in the Monitoring Tank System. Before the tanks are sampled, their contents are recirculated using one of the two monitor tanks transfer pumps (P1A or P1B).

1.3.2 Material Handling Design Requirements

1.3.2.1 Remote operation of valves and disconnects is accomplished largely through the use of mechanical linkages or remote handling tools.

1.3.2.2 Flush water and service air connections are provided to flush and blow down the entire system or portions thereof, to allow for system maintenance.

1.3.2.3 Filtration and ion exchange vessels are loaded into transport casks underwater (to take advantage of the shielding), requiring use of the Fuel Handling Building overhead crane. After the vessel is in place inside the cask (1-13C) the lid is placed on the cask and the cask is then raised above water level and allowed to drain. It is then decontaminated and made ready for shipment. Radiation monitoring of the area is performed during the operation to assure the safety of personnel and the decontamination of the cask.

1.3.2.4 A ½ ton monorail hoist is used to raise and lower the remote handling tools for the Hansen quick disconnects. These hoists are electrically operated and located on the ion exchanger, filter, and leakage containment support racks.

1.3.2.5 Filtration and ion exchange vessels are supported in the pool by special support racks designed for the SDS vessels. The racks provide support for 1) the vessels, 2) the piping runs associated with the system, 3) the Hansen quick disconnect operating tools, 4) the ½ ton lifting hoist, 5) a platform for the operator.

1.3.2.6 The polishing unit utilizes a 14-195H cask for shielding the polishing unit demineralizer. The units will remain inside the casks during normal operation, and will be handled using the Fuel Handling Building overhead crane.

1.3.2.7 The SDS was designed to be constructed in individual modules. A modular system was developed for ease of installation, removal and future use.

1.3.3 Air Handling Design Requirements

1.3.3.1 A 1000 cfm blower is provided in the Off Gas System, to maintain all ventilated units at a negative pressure.

1.3.3.2 The Off Gas Filtration System (an MSA unit) is designed to meet the Guidelines provided in NRC Regulatory Guide 1.140.

1.3.3.3 The off gas separator tank is equipped with moisture separators in the top of the tank to aid in decreasing the humidity of the exhaust gases entering the header.

1.3.3.4 An electric heater is provided at the inlet to the Off Gas Filtration System to lower relative humidity to 30% with a 100% RH inlet air.

1.3.3.5 The two HEPA filters are DOP tested in place to assure an efficiency of 99.97% for removing 0.3 micron particles.

1.3.3.6 A pressure control valve, located on the suction side of the off gas blower, controls pressure in the off gas header. The valve senses pressure at the inlet of the header. It is designed to control pressure between -4" WG- -75" WG.

2.0 DETAILED DESCRIPTION OF THE SYSTEM

2.1 Components

2.1.1 Submerged Demineralization System Pumps

2.1.1.1 Reactor Building Waste Pump (WG-P-1)

This pump is located in the Auxiliary Building on EL-280. It provides the capability to transfer liquid waste directly from the Reactor Building Sump to the upper or lower level waste storage tanks (WG-T-2A thru WG-T-2D and WG-T-1A and WG-T-1B) in the "A" spent fuel pool.

A secondary function of the pump will be for high velocity flushes of the discharge piping to the pump priming connection or suction flush connection.

The Reactor Building Waste Pump is a single stage centrifugal pump with a capacity of 150 gpm at 200 feet total dynamic head. The pump is provided with a priming connection and a seal water connection, both of which will normally re-circulate approximately 100 gpm. Remote suction and discharge pressure gages are provided to monitor pump performance.

The pump is controlled from an on/off handswitch located at the pump (Local Panel WG-C-2) or on the operating floor (EL-347'-6") of the Fuel Handling Building (Panel WG-C-1).

2.1.1.2 Submerged Demineralization Feed Pump (CN-P-IX01).

The pump is located in the standpipe (WG-U-2) associated with the four 15,000 gallon waste storage tanks (located in the Unit #2 "A" fuel pool). It provides the capability to transfer liquid waste from the upper level waste storage tanks (WG-T-2A through 2D), to the submerged ion exchange manifold for processing.

The pump is provided with a recirculation line, equipped with an orifice, which prevents inadvertent operation of the pump at a shutoff head. The recirculation line taps off of the pump discharge line in the feed pump manifold, and empties back into the twelve inch standpipe. The flow orifice provides for recirculation flowrate of 15 gpm at a 208 foot head.

The pump is a submersible centrifugal pump with the capacity of 30 gpm at 200 ft. total dynamic head. A pressure gage, temperature element and flow meter are installed on the pump discharge manifold to provide a means of monitoring pump performance.

The feed pump motor is rated at five HP and is powered from a 480 VAC MCC panel (PDP-6A). The pump is controlled from a local control panel located near the feed pump standpipe (WG-U-2), above the "A" fuel pool. Pump operation is controlled with a start pushbutton, a stop pushbutton, and a auto/hand switch, all located on the local control panel. The start and stop pushbuttons control pump operation when the auto/hand switch is in either position. When the auto/hand switch is in auto, a low level switch which senses standpipe level, will stop the feed pump on a low level in the standpipe (WG-U-2).

2.1.1.3 Polishing Unit Pumps (CW-P-PU02A & CW-P-PU02B)

These pumps are two identical 1½", air operated, double diaphragm pumps, arranged in parallel. The system is designed to operate using one pump, the second pump is an installed spare. The pump provides the capability to transfer processed water from the polishing unit demineralizer to the SDS monitor tanks. Pump speed is controlled by operating air pressure. Air pressure to the pump is controlled by a motor-operated pressure regulator. The pressure regulator is controlled from a remote control panel, either manually (using increase, decrease pushbuttons mounted on the panel) or automatically. In the automatic mode, pump speed is regulated by a logic circuit set to control water level in the polishing unit demineralizer.

For local manual operation, needle valves have been installed in the pumps operating air supply line. Operating air pressure is not to exceed 125 psig. Air supplied to the pumps passes through an oiler and an anti-freeze injector to prolong pump life and prevent freezing due to moisture in the air. The pumps are mounted on the polishing unit skid, located at the south end of the "B" fuel pool.

2.1.1.4 Monitor tank transfer pumps (P1A & P1B)

(Information to be compiled at a later date)

2.1.1.5 Off Gas Moisture Separator Bottoms Pump (CN-P-VA04)

This pump, during normal operation, will automatically maintain the level in the off gas separator tank within a preset band. In an automatic mode, pump operation will be controlled by an electrical switch associated with the off gas separator tank level indicator. The switch energizes the pump motor controller when the tank level reached 6'6". The pump then operates, removing the separator tank contents, until the tank level reaches twelve inches, and the level switch de-energizes the pumps motor controller.

The off gas bottom pump takes a suction on the off gas moisture separator tank well, and transfers the water to the feed tank standpipe (WG-U-2) for processing through the Submerged Demineralization System.

The off gas bottoms pump is a submersible centrifugal pump powered by a 5 HP motor. It is capable of producing 30 gpm at a 55 ft. head. The pump, tank, and well are located in the spent fuel surge tank.

The control panel for the pump is mounted on a skid located above the surge tank. An on/off/auto switch is provided on the panel to allow manual operation of the pump. During normal operation, the switch will be placed in the automatic position. The pump is powered from the SDS motor control center.

2.1.1.6 Off Gas Blower (CN-E-VA05)

Submerged Demineralization System components, which are ventilated, are maintained under a negative pressure by the off gas blower. The blower is designed to exhaust 1000 cfm at the systems designated differential pressure. The off gas blower is designed to maintain a minimum differential pressure in the system of 12" WG H_2O with a dirty prefilter, with a 2" WG H_2O lose in the HEPA filters.

The off gas blower is a ten inch, radial flow, centrifugal unit with a capacity of 1000 cfm. Suction and discharge pressure gages are provided to monitor blower performance. The motor is 460 volts, 3 phase, 60 Hz powered from the SDS Motor Control Center. The blower is mounted on the off gas unit skid which is located on the east wall of the "B" fuel pool. The pump is controlled with start stop pushbuttons located next to the off gas blower.

2.1.1.7 Leakage Containment System Pump (CN-P-LC06)

The leakage containment pump is designed to maintain an inward flow of fuel pool water into the leakage containment boxes which surround the SDS filters and demineralizers. The pump discharges the pool water, and any leakage from the vessel fittings, to a set of demineralizers and then to the fuel pool.

The leakage containment pump is centrifugal pump which is mounted on the catwalk between the "B" fuel pool and the cask handling pool. The pump is driven by a three HP motor which is powered from the SDS motor control center. It is controlled with stop/start pushbuttons mounted on a pump control panel located next to the pump.

2.1.2 Submerged Demineralization System Tanks

2.1.2.1 Waste Storage Tanks (WG-T-2A through 2D)

The Fuel Pool Waste Storage System is designed to store 110,000 gallons of radioactive waste water. This storage capability consists of two levels of tanks located in the spent fuel pool "A" of Unit #2 in the Fuel Handling Building.

A total of six waste storage tanks are provided to collect and store contaminated waste from either the Reactor Building sump or the miscellaneous waste hold-up tank. The two 25,000 gallon tanks (WG-T-1A to WG-T-1B) are installed in the bottom of the spent fuel pool "A". The four 15,000 gallon tanks (WG-T-2A through 2D) are then installed above the two 25,000 gallon tanks. The SDS will utilize the four 15,000 gallon tanks (WG-T-2A through 2D) and the associated valves, piping, and instruments) as feed storage tanks.

Each level of tanks has a separate supply and outlet header. Both outlet headers are connected to independent standpipes. The standpipe associated with the SDS tanks is a twelve inch standpipe (WG-U-2). The vents from each tank join a common vent header which combine with a vent from the standpipe. The vent line then runs to the SDS off gas header and is filtered by the SDS air filtration unit which discharges to the existing Fuel Handling Building Ventilation System.

This common Vent System on the tanks and standpipes is designed to operate at a slightly negative pressure maintained by the SDS Off Gas System.

The standpipe for each level of tanks is provided with a Dual Bubbler System. The system is used to determine the levels in the associated tanks and also the density of the fluid in the standpipe.

All system piping is stainless steel, schedule 40 S. The design temperature and pressure of the system is 14 psig and 200°F. The tanks were designed (but not stamped) to ASME Section VIII standards, and hydro tested to a pressure of 16 psig.

2.1.2.2 Off Gas Moisture Separator Tank (CN-T-VA02)

The moisture separator tank provides the capability of removing large amounts of liquid from ventilation and drainage lines associated with the Submerged Demineralization System. Drain lines throughout the SDS (which collect liquids from component venting, sampling, and leakage collected in manifolds) combine into a common drain header that empties directly into the moisture separator tank. Ventilation lines from various SDS components combine to join a common header. Just before this header runs into the off gas filtration unit, it forms a water trap which collects moisture from the ventilation exhaust and drains it into the

off gas moisture separator tank. The tank is a vertically mounted stainless steel tank located (along with the off gas bottoms pump standpipe) in the spent fuel pool surge tank, It is 36 inches in diameter, ten foot in length and has a capacity of 590 gallons.

The separator tank is vented back to the off gas header, just downstream of the moisture trap mentioned above. A demister assembly is located in the top of the tank to remove moisture from the tank's ventilated gases. The demister assembly has been tested in accordance with USAEC report MSAR-61-45. It will be capable of removing 99 percent of all free droplets of water, down to one micron in diameter, without any visable carryover.

A three inch drainline runs from the bottom of the tank to the off gas bottoms pump standpipe (CN-U-VA01). The standpipe is 16 inches in diameter and 16 feet long. It houses the off gas bottoms pump.

The separator tank has a barton type level instrument associated with it. The meter reads from zero percent to 100 percent full. The instrument also has a level control switch, which controls off gas bottoms pump operation, and a high level switch, which activates an alarm on high tank levels.

2.1.2.3 Submerged Demineralization System Monitor Tanks (SDS-T-1A & SDS-T-1B).

There are two 12,000 gallon tanks designed for collection and temporary storage of liquids that have been processed through the Submerged Demineralization System. The liquids are stored in the tanks until an accurate sample of the tanks contents are analyzed, and the disposition (based on sample results) of the processed liquid is determined. Based on the sample results, the contents may be discharged to: 1) the influent of the polishing unit ion exchanger, 2) the feed pump standpipe (WG-C-2), 3) to TMI process water storage tanks, 4) to the SDS flush water supply header or 5) to the EPICOR II System.

Process liquid, meeting the required radionuclide concentration levels, will be discharged to TMI process water storage tanks for disposition by TMI.

Liquid not meeting the imposed requirements may be reprocessed through the polishing unit, if it is determined that the polishing unit alone can reduce the activity levels sufficiently.

If activity levels are too high for effective decontamination by the polishing unit alone, the liquid may be pumped back to the feed pump standpipe for reprocessing through the SDS.

The tanks are vertically mounted, stainless steel tanks, located in the southeast corner of the Fuel Handling Building Model Room. The monitor tanks are atmospheric tanks built to ASME Section 10 and meet the design criteria set forth in Reg. Guide 1.143.

The tanks are vented directly through a vent line to the Fuel Handling Building Ventilation System. The influent line to each tank is equipped with an automatic isolation valve, which stops influent liquid flow when the level detector, associated with the tank, senses a high level.

Associated with each tank is a barton type level detector. The meter reads out from zero percent to 100 percent full. The level detector also provides, a signal to shut the tank influent valve on a high level (as stated above) and activates a high level alarm.

Prior to transferring the processing liquids stored in the monitor tanks, the tank contents are recirculated using one of the two monitor tank transfer pumps. The valves and piping are set up to allow either tank to be recirculated using either pump or it is possible to set up simultaneous, independent recirculation of both tanks.

2.1.3 Filtration/Demineralization Units

2.1.3.1 Submerged Demineralization System Prefilter

The prefilter is the first process vessel of the Submerged Demineralizer System. The prefilter is used to remove debris and suspended solids (greater than 125 microns in size) from the untreated radioactive waste water.

The prefilter unit is a stainless steel vessel, with approximately 10 cubic feet of volume. The vessel, including the male half of the quick disconnect, is 4 feet, 5½ inches in height and 2 feet outside diameter. The top of the vessel has four male Hansen disconnect fittings; an inlet nozzel, an outlet nozzel, a vent nozzel, and a dewatering nozzel.

Within the vessel is an enclosed area, contructed of 16 gage perferated plate (3/16 dia. holes ⅛" $\mathbb{C}$ to $\mathbb{C}$). This cylindrical column constitutes the initial filtering unit of the prefilter vessel. The inlet nozzel consists of an open ended pipe equipped with a check valve. The

nozzel is located outside of the enclosed area, between the perforated plate and the prefilter vessel wall. The inlet nozzel extends down into the vessel approximately one-half the height of the vessel. The internals of the Hansen quick disconnect, on the inlet nozzel, have been removed to prevent plugging from debris in the waste water. The inlet nozzel is equipped with two check valves which prevent a reverse flow of water out of the vessel when the vessel is disconnected from the process stream.

Contained within the enclosed area (formed by the perforated plate) is a network of fifteen, 125 micron "Cunofilter" cartridges. The opening at the upper end of each filter seals around a nozzel which empties into an outlet header. The opening at the lower end of the filter is plugged. The cartridges are supported by springs (on the bottom) which aid in sealing the upper opening around the outlet nozzels.

The prefilter assembly is also equipped with a dewatering leg and a vent nozzel. The dewatering leg consists of a ¼ inch stainless steel pipe, extending from the bottom center of the filter, around the outside of the perforated plate, and out the top of the vessel in the form of the male half of a Hansen quick disconnect. The vent consists of a short nipple (with the male half of a Hansen quick disconnect attached to the end) welded around an opening in the top of the vessel.

The flow path through the prefilter is as follows: The water enters the vessel through the inlet nozzel and passes through the 3/16 inch diameter perforated plate. It then flows through the cartridge and out the top to the discharge header where it leaves the prefilter through the outlet nozzel.

The prefilter, when installed in the system, will set inside a secondary containment located underwater at the south end of the "B" fuel pool. The purpose of the containment is to: collect any leakage which might be present from the fittings associated with the vessel, and to provide support for the filter vessel.

Pressure and radiation instruments have been installed in the system to monitor filter performance. There are pressure gages located on the influent and effluent lines to allow the operator to monitor how much pressure the filter is subjected to and to monitor the pressure drop across the filter. At a differential pressure of 20 psi the filter is considered loaded, and will be changed-out. A radiation monitor is attached to the secondary containment wall to allow the operator to monitor radiation level of the filter.

2.1.3.2 Submerged Demineralization System Final Filter

The final filter is the second and last mechanical filtration unit in the SDS. The filter is used to remove any suspended solids (greater than 10 microns in size) from the contaminated waste water. In the system, the final filter is located on the effluent side of the prefilter.

The final filter vessel shell is identical to the prefilter vessel shell. It is a stainless steel vessel with approximately ten cubic feet of volume. The vessel, including the male half of the quick disconnects, is 4 feet 5½ inches in height and two feet outside diameter. The top of the tank has four male quick disconnect fittings, an inlet nozzel, an outlet nozzel, a vent nozzel, and a dewatering nozzel.

Arranged within the filter are three concentric circles of "Cunofilters" totaling thirty cartridges. The cartridges are mounted in the final filter in the same manner as they are mounted in the prefilter. A spring on the bottom, seals the cunofilter against the effluent header nozzels.

The final filter inlet nozzel is a short nipple with the male half of a Hansen quick disconnect welded to it. The other end of the nipple is welded around an opening in the top of the vessel. The filter's vent nozzel is constructed the same as the inlet nozzel.

The outlet nozzel is a short run of pipe extending from the cunofilter effluent header, through the top of the vessel and ending with a male quick disconnect. The dewatering leg is a ½ inch pipe which runs from the bottom center of the vessel, up through the vessel, 8 inches from the vessels centerline. The line penetrates the top of the vessel, and ends with a male quick disconnect.

The flow path through the filter is as follows: the water enters the vessel through the inlet nozzel and flows down and around the Cunofilters. The water then passes through the cartridge and leaves the vessel through the outlet nozzel.

The final filter, when installed in the system, will set inside a secondary containment located underwater at the south end of the "B" fuel pool. The purpose of the secondary containment is to collect any leakage which might be present from the fittings associated with the vessel, and to provide support for the filter vessel.

Pressure and radiation instruments have been installed in the system to monitor filter performance. There are pressure gages located on the influent and effluent lines to allow the operator to monitor how much pressure the filter is subjected to, and the pressure drop across the filter. At a differential pressure of 20 psi the filter is considered loaded and will be changed-out. A radiation monitor is attached to the secondary containment wall, which allows the operator to monitor the radiation level of the filter.

2.1.3.3 Ion Exchange Vessels

Zeolite beds, cation beds, and leakage containment ion exchange beds, are all contained in a standard vessel, identical in size to the filtration unit vessels, (4 feet, 5½ inches in height and 2 feet in diameter). This size vessel is used to allow use of the CNSI 1-13C shipping casks.

These vessels are equipped (as are the filtration vessels) with four nozzels on the top. All four nozzels are capped with the male half of a Hansen quick disconnect. Three of the four fittings are 1½ inch and the fourth is a three inch fitting.

The inlet nozzel is a short run of pipe, which extends from the quick disconnect, down into the vessel, and empties into a spray ring. The ring is a 1½ inch pipe rolled into a 12 inch diameter ring, located horizontally near the top of the vessel.

There are six 5/16 inch diameter holes drilled through the bottom of the ring. The holes are enclosed in a one inch long 3/4 inch diameter, .007 inch screen cup, which is welded around the hole.

The vent nozzel is a short nipple welded around a hole in the top of the vessel. A three inch in diameter, .007 inch screen cup is welded around the hole on the inside of the vessel as a resin retaining measure.

The vessels outlet line serves two purposes. It is the normal outlet line, and it serves as a dewatering leg. The outlet line is an 1¼ inch straight pipe which extends from just off the vessel bottom, up through the center of the vessel and penetrates the top of the vessel. The bottom end of the shaft is enclosed within a screened area, which act as resin retaining screens. The enclosed area is formed by two concentric rings of expanded metal is lined with 80 mesh screen.

The fourth nozzel on the vessel is used as an access opening. It is a three inch nozzel welded around an opening in the top of the vessel. The nipple is capped with a three inch male quick disconnect with internal valve removed, which has a removable plug installed.

The influent water enters the vessel through the inlet nozzel.

Water sprays out into the purification media from the spray ring holes. The water is forced down through the media, and up through the outlet line where it leaves the vessel.

Zeolite and cation vessels will be located (when installed in the system) in secondary containments that are the same as those used with the prefilter and final filter. The leakage containment pump takes a suction off the bottom of all the containments and draws any leakage from the vessel fittings along with pool water down through the containment to the pump and discharges it to the leakage containment ion exchangers. The zeolite and cation beds are located along the east wall of the "B" fuel pool.

The leakage containment ion exchangers will also be enclosed by a secondary containments, however, the containments will not have covers on them like the cation and zeolite vessel containments. They will be located at the center of the north end of the "B" fuel pool.

The ion exchange vessels are provided with pressure gages on the influent and effluent lines. The gages are used by the operator to monitor pressure drops across the ion exchange medias. Radiation monitors on the containments will be provided on the "A" zeolite beds only. Curie loading will be calculated from sampling results of the influent and effluent samples.

2.1.3.4 SDS Polishing Unit Demineralizer

The polishing unit demineralizer is a 195 cubic foot mixed bed ion exchanger. The purpose of the demineralizer is to further reduce the activity level in the effluent liquid of the zeolite and cation beds. The demineralizer, installed in the system, will set in a CNSI 14-195H cask located above the water level at the south end of the "B" fuel pool.

The vessel is a cylindrical carbon steel unit. A two foot in diameter access hole is provided on the top of the vessel. Within the vessel is an inner column (approximately two feet in diameter) which extends from the bottom of the vessel to within a few feet of the top of the vessel.

There are three piping runs within the vessel, an inlet, an outlet, and a dewatering leg. The inlet line runs from the top of the vessel to the bottom outer area of the vessel. Here the line empties into a distribution ring which runs the circumference of the outer area. The outlet line runs from the bottom of the inner volume (where it is enclosed in a strainer) to the top of the tank. The dewatering leg runs from the bottom of the outer volume (where it is enclosed in a strainer) to the top of the tank.

When installed in the system, the demineralizer will be equipped with a fillhead assembly, which sets in the opening on the top of the vessel. The fillhead houses the flexible hoses and valves which connect the three demineralizer lines to the associated piping on the polishing unit skid. A vent line is also provided in the fillhead which directs the demineralizer vented gases to the SDS off gas header. Two induction type level probes are mounted in the fillhead. Both probes detect the water level in the demineralizer. One of the probes operates a level switch which activates a hi-hi level alarm and shuts the unit influent isolation valve. The other probe operates a level transmitter which activates a high and low level alarm and provides level indication. The transmitter also adjusts (according to water level) the polishing unit pumps air supply pressure regulator, when system is in automatic, which varies pump speed in order to automatically maintain a preset level within the demineralizer.

The flow path through the demineralizer is as follows: The water enters the demineralizer through the influent line, where it is directed to the bottom of the demineralizer and distributed into the outer volume of resin via the distribution ring. The water flows up through the outer volume of resin, and is then drawn down through the inner volume of resin. The processed water enters the effluent line, at the bottom of the inner volume of resin, and flows up and out of the demineralizer unit.

The inner volume of the unit is dewatered using the demineralizer effluent line. The outer volume is dewatered using the dewatering leg provided for that purpose. Dewatering is accomplished using the polishing unit dewatering pumps. The demineralizer will remain inside of a shipping cask, while installed in the SDS, as a means of reducing personnel exposure levels.

Demineralizer loading will be determined by influent and effluent sample result analysis. Since the demin is a free filling volume, differential pressure determination is difficult to analyze. However, an increase in demin influent pressure or a decrease in polishing unit pump suction pressure, is an indication of demin plugging. Although it is considered unlikely, an excessive change in either reading will dictate the change-out of the demin.

As a backup to sampling analysis, periodic radiation contact readings on the shipping cask will be performed to insure radiation levels do not exceed shipping limits.

2.1.4 Manifold Containments

2.1.4.1 Filter Manifold Containment

A majority of the valves, instruments, and piping runs, associated with the prefilter and final filter are located in a manifold housed in a ventilated containment. This manifold is located on the polishing unit cask support platform at

the south end of the "B" fuel pool.

The containment is 3 feet, 6 inches wide, 6 feet 10 inches long and 1 foot 10 inches deep. It is constructed with 3/16 inch thick stainless steel plates and frames. Shielding is provided on the outside of the containment on the top and sides. The bottom of the containment is sloped to one end for drainage.

The containment is ventilated and maintained at a negative pressure by the SDS Off Gas System. The intake and exhaust connections are 2 inch lines located at opposite sides and ends of the containment. Six inch access holes are provided through the top of the containment for maintenance of the valves and instruments. Valve operation will be performed using valve extensions which protrude through the top shield.

2.1.4.2 Feed Pump Manifold Containment

Valves, piping, and instruments associated with the feed pump manifold are housed in a ventilated containment. This manifold is located in the northwest corner of the "A" fuel pool, next to the waste storage tank standpipe (WG-U-2).

The containment is approximately 4 feet 9 inches long, 2 feet 2 inches wide, and 1 foot 9 inches deep. It is constructed of 3/16 inch stainless steel plates and support frames. Shielding is provided on the sides of the containment.

A carbon - steel block, 5 inches thick, 4 feet 9 inches long, and 2 feet 2 inches wide, is used as a top and shield for the containment. Six inch diameter access holes are provided through the top of the containment for maintenance of the valves and instruments, valve operation will be performed using valve extensions which protrude through the top shield.

Ventilation intake and exhaust lines are provided at opposite ends of the containment. The containment is ventilated and maintained at a negative pressure by the SDS. The bottom of the containment is sloped to one end for drainage toward the drain line and to the feed pump standpipe (WG-U-2).

The containment houses a pressure instrument, temperature detector and a flow element. The feed pump discharge valve, feed pump recirculation valve, and manifold flushing valves are operated from this containment.

2.1.4.3 Submerged Ion Exchange Manifold Containment

The submerged ion exchange manifold containment houses valves, piping, and instruments associated with the submerged ion exchange manifold. The manifold is located on the walkway between the "B" fuel pool, and the spent fuel surge tank.

The containment is 13 feet 3 inches long, 3 feet 6 inches wide and 2 feet 4 inches deep. It is constructed of 3/16 inch stainless steel plating and reinforced with stainless steel supports.

The containment is divided into two sections, a high level section and a low level section. Piping runs and associated equipment, subjected to waste which has not been processed through a zeolite train, are located in the high level area.

The south end of the containment drops down over the edge of the "B" fuel pool wall and is partially submerged underwater. With the exception of sampling and flushing lines, piping enters the containment underwater (into this dropoff) for shielding considerations.

A one inch carbon - steel plate will cover the low level area and a five inch carbon - steel plate will cover the high level area. The sides of the containment are shielded according to the radiation levels estimated to exist.

The containment is ventilated and maintained at a negative pressure by the SDS Off Gas System and drains to the moisture separator tank. The air intake nozzel is located in the low level area, and the exhaust is in the high level area.

2.1.4.4 Reactor Coolant System Cleanup Manifold

The RCS cleanup manifold was developed in order to establish tie-in points in the SDS System which can enable it to process the Reactor Coolant System.

The RCS cleanup manifold will be located on the south-east corner of the SDS cask support platform.

The RCS cleanup manifold is four feet wide, four feet long and two feet high. The manifold is ventilated and maintained at a negative pressure by the SDS Off Gas System, and drains to the SDS off gas moisture separator tank. The manifold is shielded and the valves are operated from outside of the containment using valve hand-wheel extensions.

2.1.5 Off Gas Header Components

2.1.5.1 Off Gas Heater

The 9 KW off gas heater is provided to decrease the humidity of the gases to insure proper operation of the HEPA filters.

During normal operation, the off gas heater cycles on and off automatically to control the air temperature leaving the heater. at 190°F. A temperature element senses heater effluent air temperature, and depending on the temperature, completes or interrupts power to the heater. A second temperature element s installed in the same location as the element mentioned above. The second element activates a high temperature alarm and interrupts power to the heater, if heater effluent temperature reaches 200°F.

A temperature indicator is installed on the heaters influent line. It allows the operator to monitor heater differential temperature and thereby evaluate heater performance. A flow indicator, also mounted on the heaters influent line, allows the operator (on system light off) to determine when sufficient air flow exists for heater operation.

An interlock is installed in the heater controller which prevents heater operation if the off gas blower circuitry is de-energized.

2.1.5.2 Off Gas Header Filters

Ventilated gases, from components ventilated by the Vent and Drain System, will pass through four filters in the off gas header before being exhausted to the plant's vent stack. The three filters consist of a roughing filter and two HEPA filters.

All three filters are equipped with differential pressure detectors. These instruments allow the operator to monitor filter loading, and determine when a filter needs replacing.

DOP test connections are provided on the effluent side of each filter. All filters will be DOP tested after the header is installed in the SDS, and individual filters will be DOP tested as they are replaced.

The roughing filter is a waterproof, fiberglass type filter, compatible with the air stream. It has a minimum efficiency of 60 percent when new. The filter is designed to withstand a pressure drop of 8 inches W.G., either new, wet or loaded with dust, for at least 15 minutes without damage. At a differential pressure of .5 inches W.G. the filter will be replaced.

There are two HEPA filters installed in the off gas header.

designed to be 99.97 percent efficient with particles down to 0.3 microns in size. The filters are 24 inches by 24 inches square and 11½ inches deep. The filter media is principally inorganic fibers. Organic fibers will not exceed 5 percent. At a differential pressure of 1 inch W.G. the filter will be replaced.

2.1.6 Major System Valves and Miscellaneous Components

2.1.6.1 Polishing Unit Control Panel

The polishing unit control panel is provided for ease of unit control and monitoring, and to house the control circuitry for automatic system functions. The panel will be mounted adjacent to polishing unit skid during system operation.

The panel displays, in a digital readout, five system parameters. The five readings are: 1) system influent flow rate, 2) system influent temperature, 3) demin effluent conductivity, 4) system effluent flow rate, 5) demin water level.

Associated with the last reading (demin water level) is an adjustment selector switch, and three adjustment dials. The adjustment selector switch is a four position switch: process, hi alarm, low alarm, and set point. The three adjustment dials are: high level adjust, low level adjust, and set-point adjust.

When the adjustment selector switch is in "process" position, the demin level indicator indicates the actual level in the demin.

When the adjustment switch in the "hi alarm" position, the demin level indication will read out the level at which the hi level alarm is set to alarm. By turning the "hi level adjust"

dial, the operator can alter the level setting at which the "hi level alarm" alarms.

Placing the adjustment selector switch in the "low level" position, causes the demin level indicator to display the demin low level alarm setpoint. The operator can adjust this setpoint by turning the "low level adjust" dial.

When the adjustment selector switch is placed in the "setpoint" position, the level indicator displays the level at which the panel's logic circuit is programmed to maintain in the demineralizer. The operator can vary the setpoint by adjusting the "setpoint adjust" dial.

Six (6) alarm indicators, an alarm annunciator, and three alarm associated switches are also mounted on the control panel. The six alarms are: 1) high influent waste temperature 2) high filter pressure, (a polishing unit filter which was to be used in this system, has been deleted from service), 3) demin high pressure, 4) demin low level, 5) demin high level, 6) demin hi-hi level.

The three (3) switches associated with the alarm indicators are: 1) an alarm acknowledge switch, which de-energizes the audible alarm annunciator, 2) an alarm override switch, which de-energizes any circuitry associated with all automatic functions which are taking place due to the alarm condition, 3) an alarm reset switch, which de-energizes the alarm

indication light if the alarm condition has been corrected.

The waste valve (the polishing unit influent isolation valve) can be opened or shut from the control panel by the operator. Two (2) switches, an open switch and a shut switch are located on the panel for this purpose.

Dewatering pump control is also accomplished from this panel. An "on/off" switch opens or shuts a solenoid operated isolation valve which is located in the pump operating air supply line. A "manual/auto" switch determines which control circuitry supplies supplies power to a motor operated pressure regulator located in the dewatering pump operator air supply line (the pressure regulator controls the speed of the pump).

When the manual/auto switch is in the manual position, the motor on the pressure regulator is operated when the operator depresses either an "increase" switch or a "decrease" switch (both of which are also located on the control panel). Depressing the "increase" switch causes the motor to open the pressure regulator more, increasing downstream air pressure and thus increasing pump speed. Depressing the decrease switch causes the motor to shut down on the pressure regulator, decreasing downstream pressure and thus decreasing pump speed.

Placing the "manual/auto" switch in auto, causes the pressure regulator motor to receive its operating power from the control

panel demineralizer level control circuit. In this mode, the demineralizer level logic circuit automatically varies pump speed as it tries to maintain the demineralizer level at its pre-set target level.

The control panel is powered from a 120 volt single phase recepticle. Located on the top of the panel is a power lockout "on/off" switch which controls power to the panel. A "power on" light denotes whether or not the panel is energized.

2.1.6.2 Waste Storage Tank Fill Valve (WG-AV-02)

The waste storage tank fill valve is an automatic isolation valve. The valve is designed to shut automatically as a protective function against overfilling the feed tanks (WG-T-2A through 2D). At a predetermined level (19 inches below the tanks top) the valve actuator is energized and the valve shuts.

An "open/close" switch and an "auto/off" switch is provided on local control panel (WG-C-1) for the fill valve (WG-AV-02). The local control panel (WG-C-1) is located on the 347'6" elevation of the Fuel Handling Building on the west side of the storage pool.

The valve is interlocked with a level switch on the bubbler level instruments in the standpipe (WG-U-2). When the "auto/off" switch is in the "auto" position the valve closes

on a high level in the tanks. The valve can be opened or closed with the "auto/off" switch in the "auto" position. The valve cannot be opened with the "auto/off" switch in the "off" position.

The fill valve is located on the 347'6" elevation, east of the "A" fuel pool. It is a two inch, actuator operated plug valve.

2.1.6.3 Submerged Ion Exchange Manifold Influent Automatic Isolation Valve (CU-V-IX24)

The automatic isolation valve is a 1½ inch solenoid operated ball vale. It is located in the high level area of the submerged ion exchange manifold containment, at the north end of the "B" fuel pool.

The valve is designed as an automatic function to prevent adverse conditions from occuring which might damage equipment and/or cause injury to personnel.

The valve will shut automatically, after a predetermined time delay of up to 30 minutes, should one of the following conditions develop: 1) an overpressure condition in the off gas header, 2) a high radiation level detected by one of the in-line radiation monitors, or 3) a high general area radiation level in the vicinity of the ion exchange manifold.

An "auto/manual" switch is used to control the valve. The switch is located on a local control panel mounted above the "B" fuel pool surge tank.

The valve is interlocked with a pressure switch in the off gas header, various line radiation monitors, and a general area radiation monitor. With the "auto/manual" switch in "auto" the valve will shut if any of the above instruments detect an alarm condition. Placing the switch in manual shuts the valve.

2.1.6.4 Polishing unit influent isolation valve (CV-V-PU61). The waste valve is located at the head of the polishing unit influent line. The purpose of the valve is to isolate the unit if a condition develops which may cause damage to equipment or personnel.

The valve is a 1½ inch air operated ball valve. When air is applied to the valve diaphragm, the valve opens; and when the air pressure is removed, the valve shuts. Air to the valve's diaphragm is controlled by a solenoid operated valve.

Power to the solenoid valve is normally controlled by open and shut switches located on the polishing unit control panel. Power to the solenoid can also be interrupted (causing the waste valve to shut) by a pressure switch located on the unit influent line, a level switch located in the demineralizer

fillhead, or a temperature switch located in the unit influent line.

If polishing unit influent pressure increases above a predetermined level the pressure switch opens, interrupting power to the solenoid. A hi-hi level in the demineralizer will also interrupt power to the solenoid, shutting the waste valve. Influent temperature greater than 125°F will cause the valve to shut. Air to the waste valve is supplied from the unit service air connection.

2.1.6.5 Monitoring Tanks' Fill Isolation Valves

The fill isolation valves are designed to automatically isolate the monitoring tanks if the tanks are filled above a pre-set level.

There are two independent valves, one for each tank. The valves are located on the influent line to each tank. They are located on the influent line to each tank. They are 1½ inch solenoid operated ball valves. The actuators are interlocked with the level indicators used on the monitor tanks.

Associated with the valve is an "auto/manual" switch and an "open/shut" switch. If the "auto/manual" switch is in "auto", the valve will shut on a high tank level. The valve can be opened or shut manually, using the switch, if the "auto/manual" switch is in "auto" or "manual" position.

The valves are located near the monitoring tanks in the Fuel Handling Building Model Room. The switches are mounted on an indication and control panel located in the fuel pool. The valves are powered from a 120 volt 10 amp instrument and lighting panel.

2.2 Instruments, Control, Alarms, and Protective Devices

Throughout the Submerged Demineralization System, as with most other fluid systems, are many instruments and detectors of various types which allow the operator to monitor the performance of his equipment. Some of these instruments not only provide indication of a parameter, but also initiate automatic devices designed to alert the operator and/or alter system operation in a manner as to prevent equipment damage and/or personnel injury.

Most major components throught the system are equipped with pressure instruments on the influent and effluent sides of the component. The gages are provided to give the operator an accurate indication of the performance of the component. In a few cases pressure switches are also provided which act to shut down system operation if an over pressure condition should occur.

Differential pressure detectors are used throughout the system, mainly on ventilated components and components in the off gas header. These detectors are used by the operator to insure proper air flow.

Flow detectors are located at strategic points in the system, where accurate control of the flow is essential for proper operation of the components. The three major flow detectors used in the system are located on the feed pump discharge line, and one on the influent line to each of the two zeolite trains. The efficiency of zeolite decreases rapidly under excess flow conditions, therefore, accurate control of the amount of flow through the zeolite beds is necessary. Flow control is accomplished by the operator, using diaphragm operated throttle valves located on the pump discharge line and on the influent line to each zeolite train.

The system is equipped with temperature detectors upstream of the zeolite beds and upstream of the polishing unit. These elements insure the operator that system temperature is low enough to prevent damage to the resin beds. Temperature elements are also used in the off gas header to monitor the off gas air temperature.

Protection against unexpected increases in radiation levels from resin bed breakthrough or crud trap build up is provided through the use of various in line radiation monitors and general area radiation monitors. All radiation monitors are equipped with alarms and most are designed to initiate some automatic protective function.

The level detectors in this system not only provide alarm and indication functions but also initiate and control certain automatic functions designed to protect equipment and personnel.

3.0 SUBMERGED DEMINERALIZATION SYSTEM MODES OF OPERATION

3.1 Off Gas System

3.1.1 System Start-Up

Prior to operating any portion of the Submerged Demineralization System, the Vent and Drain Systems comprise the Off Gas System must be operating.

After a valve line up is performed and the TMI Unit #2 Control Room has been notified, the 1000 cfm off gas blower will be started. Flow will be established through the components which are ventilated by the off gas headers. When sufficient flow through the heater has been verified, the heater will be energized. The flow through the SDS components will then be balanced to within specifications. Initially, frequent monitoring of the system's parameters will be performed to insure proper operation of the equipment.

3.1.2 System Operation

During normal operation, the off gas filtration unit has been designed to require little operator action. The unit should be periodically checked to ensure that temperatures, flows and radiation levels are within the normal ranges.

Increasing differential pressure across the roughing filter, charcoal filter, or the HEPA filters in an indication that the filters are retaining dirt and other airborne particulate.

These components should be replaced as required to insure that flow through the ventilation unit is maximized.

The off gas moisture separator tank level should be monitored periodically to insure the level control system is functioning properly. During initial component venting (i.e. venting of the prefilter and final filter), or other operations during which large amounts of liquids are dumped into the Vent and Drain System, moisture separator tank level should be monitored more frequently.

3.1.3 System Shutdown

The purpose of the Ventilation System is to ensure that all ventilated gases, from the Submerged Demineralization System components, is filtered and monitored for radiation. Shutdown of the Off Gas System will preclude filtration and monitoring of the air, and should not be performed unless dictated by other casualty/operational considerations. To secure the Off Gas System, secure the 9KW heaters, seal and isolate all ventilated components, secure the off gas blower and then place the system in a normal shutdown line-up.

3.2 Feed Tank Filling Operation

3.2.1 Fill Operation Start Up

The feed tank filling operation involves SDS equipment and TMI equipment.

Prior to system operation, system operators will be required to have in operation the SDS Off Gas System and the Leakage Containment System.

These support systems must be in operation at the onset of and throughout the duration of, the fill operation.

After system operators have completed the line up to fill the feed tanks, they will light off the Reactor Building waste pump (WG-P-1A), and commence filling the feed tanks.

Initially, all system parameters will be continuously monitored until proper operation of the system has been verified.

3.2.2 Normal Operation

The feed tank filling operation will be a batch fill process (the tanks will be filled, the water processed, and then the tanks refilled). During normal filling operation, no water will be processed through the remainder of the Submerged Demineralization System.

System parameters will be periodically monitored while filling the feed tanks. Filters will be replaced if instruments indicate they are loaded. Changing out a filter requires the filling operation to be secured.

Periodic sampling will be performed to provide an indication of the approximate chemical content of the liquid stored in the tanks, and an indication of the performance and loading of the filters.

A fill completion time calculated from the fill rate and volume should be calculated as a back-up method of feed tank level determination.

3.2.3 Securing the Filling Operation

When the feed tanks have been filled to the desired level, the operators will secure the Reactor Building waste pump.

3.3 Processing the Filtered Water

3.3.1 Processing System Start Up

At the onset and throughout the duration of the processing, the SDS Off Gas System and Leakage Containment System will in operation. Processing will be secured if either support system has to be secured.

The ion exchange vessels will be filled and vented prior to installation into the system. Line venting will be accomplished on initial system light off, and will not be repeated on subsequent light off. With all vessels installed in the system, the operators will line up the system for operation. The submersible feed pump will be started after the submerged ion exchange manifold, the polishing unit and the monitor tanks are lined up for operation. Throttle valves will be adjusted to provide the proper flow rates through the system.

When the polishing unit demin fills to the operating level, a polishing unit pump will be started and placed in automatic. Polishing unit demineralizer level will be monitored closely until proper operation of the level control system is verified.

Monitor tank level indication will be checked frequently to verify expected increases. Increases below expected levels could indicate a system leak or malfunctioning level instruments. Piping throughout the system will be checked for gross leakage on system start ups, and during operation.

System sampling will be performed shortly after light off to verify expected unit D.F.'s.

3.2.2 Processing System Operation

Once the flow rate is established, the system functions almost automatically with little operator action. Instrumentation is provided on the system monitoring panel and at various locations throughout the system to monitor system parameters. Operators will be responsible for insuring that proper system flow rates are maintained and auto controls function properly.

Periodic sampling (at various sample points) is performed to verify bed performance and monitor expected bed loading.

3.3.3 Process System Shutdown

When it has been determined by sampling that a process demineralizer is loaded, the operator will secure the feed pump and the polishing unit pump, and flush the system with demineralized water.

The first zeolite bed in the train is then removed, and stored in storage racks in the "B" fuel pool. The second bed in the series is moved into the first position, and the third bed is moved into the second position. A new zeolite bed is installed in the third position.

3.4 Special Evolutions

3.4.1 Cation Vessel Charge Out

Replacement of a cation vessel does not dictate securing the process evolution. When it is determined a cation vessel needs to be replaced, the stand by vessel is valved

into the system. The spent vessel is then isolated. The vessel is then flushed and removed from the system; it is stored and a new vessel is installed in its place.

3.4.2 Replacement of a Polishing Unit Demineralizer

Replacement of this vessel requires the shutdown of the system. After the system is secured, the vessel will be flushed, dewatered, removed and replaced.

3.4.3 Leakage Containment Ion Exchanger Vessel Replacement

There are two leakage containment ion exchangers arranged in parallel in the system. One ion exchanger is in service and the other is in stand-by. When it is determined that the in-service ion exchanger must be replaced, the stand-by vessel is placed in service and the spent vessel is isolated. The stand-by vessel is used in order to eliminate the need to secure the process evolution due to leakage containment vessel replacement.

3.4.4 Ventilation Filter Replacement

When a ventilation filter requires replacement, the Submerged Demineralization System will be shutdown. After a suitable period, the Ventilation System will be shutdown and the filter replaced.

3.5 Emergencies

3.5.1 Loss of the SDS Off Gas System

On loss of the SDS Off Gas System, the SDS will be shut down and system components sealed until the off gas system is restored to service. Unit II Control Room will then be notified, unnecessary personnel evacuated, and

essential personnel will put on self contained breathing apparatus.

3.5.2 Fire

If a fire is detected by a SDS operator or any other personnel in the area, the Unit #2 Control Room will immediately be notified. The personnel in the area will then fight the fire (if possible) with available fire fighting equipment.

3.5.3 Loss of Electrical Power

On a loss of system electrical power, the SDS feed pump will stop, and the IX manifold influent valve shuts.

A solenoid in the polishing unit pump air supply line will fail shut stopping the pumps. At this point, the process operation is essentially shut down, and the actions for loss of the SDS Off Gas System can be implemented.

3.5.4 Dropped Vessel in Pool

SDS vessels will only be handled underwater so that if a vessel was dropped, it would occur underwater. If this were to happen, the operator would notify Unit II Control Room, make an immediate visual inspection of system components for possible damage (system instrumentation will also be checked for indication of damage). If damage has occured to any system components, the operator will take corrective action if necessary. If no component damage has occured, attempts will be made to retrieve the vessel.

3.5.5 A Dropped Cask

If a cask is dropped in the Fuel Handling Building, the SDS feed pump and polishing unit pump will be stopped, the Fuel Handling Building will be sealed, and all unnecessary personnel will be evacuated from

the Fuel Handling Building. The Unit II Control Room and the Health Physics Department will be notified.

3.5.6 Man in the "B" Fuel Pool

If a man falls into the "B" fuel pool processing and equipment handling will be stopped and every attempt will be made to retrieve the man from the pool. Unit II Control Room and the Health Physics Department will be notified.

4.0 HAZARDS AND PRECAUTIONS

Since the system is handling radioactive liquids, all appropriate Health Physics safety precautions must be observed during operation and maintenance. Under no circumstances will liquid discharges be made to the environment without authorization from the NRC.

The SDS Off Gas System will process potentially contaminated air. As such, any operation or maintenance associated with the system should fully incorporate appropriate Health Physics guidelines/requirements. Any solid or liquid ventilation system waste must be sampled and cleared by Health Physics before release to the environment.

Flushing connections are provided at various locations throughout the system. Flushing should be exercised before maintenance is performed, as a means of reducing radiation levels.

Revision 1
10/3/80

TABLE 1

SDS PUMPS

PUMP DETAILS

Identification	CN-P-IX01
Noun Name	Feed Pump
Manufacturer	Goulds Pump Inc.
Model No.	V1S 6ALC
Type	Submersible/Centrifugal
Standard Material Designation	Stainless Steel
Rated Speed, rpm	3500 rpm
Rated Capacity, gpm	30 gpm
Rated Total Dynamic Head, ft.	240 ft.
Shutoff Head, ft.	
Design Pressure, Casing, PSIG	
Design Temperature, ^{o}F	$100^{o}F$
Lubricant	Water

MOTOR DETAILS

Manufacturer	Franklin
Type	Introduction
Enclosure	Submersible
Rated Horse Power, HP	5 HP
Speed, rpm	3500 rpm
Lubricant/Coolant	Water Cooled
Power Requirements	460 volts, 3 phase 60 Hz, 5.9 amps
Power Source	SDS PDP 6A

Revision 1
10/3/80

TABLE 1 (Cont'd.)

SDS PUMPS

PUMP DETAILS	
Identification	CN-P-PU02A & CN-P-PU02B
Noun Name	#1 & #2 Polishing Unit Dewatering Pumps
Manufacturer	Warren Rupp Co.
Model No.	SB 1½" - A
Type	Air Operated Double Diaphragm
Standard Material Designation	316 S S
Rated Speed, rpm	varies with operating air pressure
Rated Total Dynamic Head, ft.	Greater than 200 ft.
Shutoff Head, ft.	Greater than 200 ft.
Design Pressure, Casing, PSIG	125 PSIG
Lubricant	Lightweight oil
Power Source	100 psi Service Air
Rated Horse Power	varies with air pressure
Optimum Operating Speed	varies with Discharge head

TABLE 1 (Cont'd.)

SDS PUMPS

PUMP DETAILS	
Identification	SDS-P-1A & SDS-P-1B
Noun Name	Monitor Tank Transfer Pumps
Manufacturer	
Model No.	
Type	Double mechanical seal - centrifugal
Standard Material Designation	
Rated Speed, rpm	
Rated Capacity	50 GPM
Rated Total Dynamic Head, ft.	
Shutoff Head, ft.	
Design Pressure, Casing, ft.	
Design Temperature, ^{o}F	
Lubricant	Water
MOTOR DETAILS	
Manufacturer	
Type	
Enclosure	
Rated Horse Power	
Rated Speed, rpm	
Lubricant/Coolant	
Power Requirements	
Power Source	

TABLE 1 (Cont'd.)

SDS PUMPS

PUMP DETAILS	
Identification	CN-P-VA04
Noun Name	Offgas Bottom Pump
Manufacturer	Goulds Pumps Inc.
Model No.	00982 3870
Type	Submersible
Standard Material Designation	400 series stainless steel
Rated Speed	3450 rpm
Rated Capacity	30 gpm
Rated Total Dynamic Head, Ft.	65 ft.
Design Temperature, ^{o}F	100^{o}F
Lubricant	Water

MOTOR DETAILS	
Manufacturer	Franklin
Type	Submersible
Encloaure	Submerged in oil
Rated Horse Power	One (1) HP
Speed	3450 rpm
Lubricant/Coolant	Oil
Power Requirements	3.5 amps, 460 volts, 3 Phase, 60 HZ
Power Source	SMS PDP-6A

TABLE 1 (Cont'd.)

SDS PUMPS

PUMP DETAILS

Identification	CN-E-VA05
Noun Name	Offgas Blower
Manufacturer	Buffalo
Model No.	5E
Type	Radial Flow Centrifugal Type "E"
Standard Material Designation	Sheet Steel
Rated Speed, rpm	3510 rpm
Rated Capacity, cfm	1000 cfm
Design Temperature	40°C

MOTOR DETAILS

Manufacturer	Westinghouse
Type	K
Enclosure	TEFC
Rated Horse Power	5
Speed, rpm	3510
Lubricant/Coolant	oil/air
Power Requirements	460 volts, 3 phase, 60 Hz
Power Source	SDS PDP-6A

TABLE 1 (Cont'd.)

SDS PUMPS

PUMP DETAILS	
Identification	CN-P-LC06
Noun Name	Leakage Containment System Pump
Manufacturer	Goulds Pump's Inc.
Model No.	3196 MT A-60
Type	Centrifugal
Standard Material Designation	316 S.S.
Rated Speed, rpm	1750 rpm
Rated Capacity, gpm	120 gpm
Rated Total Dynamic Head, ft.	55 ft.
Shutoff Head, ft.	43 ft.
Design Pressure, Casing, PSIG	285 PSIG
Design Temperature, ^{o}F	$100^{o}F$
Lubricant	Water
MOTOR DETAILS	
Manufacturer	Westinghouse
Type	Type S
Enclosure	TEFC
Rated Horse Power, HP	3 HP
Speed, rpm	1750 RPM
Lubricant/Coolant	oil/air
Power Requirements	460 volts 3 phase 60 Hz
Power Source	SDS PDP-6A

Table 1 (Cont.)

SDS Pumps

Sump Pumps

Pump Details			
Pump Identification	CN-P-FL07	CN-P-SA08	CN-P-RC09
Noun Name	Hi Rad Filter Manifold Sump Pump	Hi Rad Filter Sample Box Sump Pump	RCS Manifold Sump Pump
Manufacture	Gorman Rupp	March	Gorman Rupp
Model Number	14925-001	212	11968-000
Type	Lab Ocillating	Metering	Lab Ocillating
Standard Material Designation	Hapalon	Ryton-PPS	Hapalon
Rated Speed	3600 pul/min	3600 rpm	3600 pul/min
Rated Capacity GPM	.13 gpm	50-1000 cc/min.	.15 gpm
Stalling Pressure PSIG	34.6	160 psi	34.6
Design Temperature ^{o}F	Ambient(< 104)	Ambient(< 104)	Ambient(<104)
Drive Unit Details			
Manufacture	Gorman Rupp	March	Gorman Rupp
Type	Coil-Silicon Retifier	Shaded Pole	Coil-Silicon Retifier
Speed pul/min	3600	3600 rpm	3600
Power Requirements	115 volt 60 Hz 28 watts .35 amps	115 volt 60 Hz 1.6 amps	115 volt 60 Hz 28 watts .35 amps

Revision 1
10/3/80

TABLE #2

FILTER VESSELS

PREFILTER/FINAL FILTER

VESSEL DETAILS

Identification (Prefilter/final filter)	CN-F-FL01/CN-F-FL02
Number Installed	Two
Manufacturer	CNSI
Installation	Vertical
Outside Diameter/Height, ft. in.	2 ft/4 ft 5½ inch
Shell Thickness	3/16 inch
Shell Material	Stainless Steel
Design Pressure/Temperature	150 PSI/200°F
Volume	10 cubic feet
Prefilter size	3/16" Roughing filter/125 micron cuno
Final filter size	10 micron cuno

TABLE 3

DEMINERALIZERS

ZEOLITE DEMIN VESSELS

VESSEL DETAILS	
Identification	CN-K-IX01A through CN-K-LX01C CN-K-IX02A through CN-K-IX02C
Number Installed	Six (6)
Installation	Vertical
Outside Diameter/Height, ft. in.	2ft/4ft. 5½ inch
Shell Thickness	3/16 inch
Shell Material	Stainless Steel
Design Pressure/Temperature	150 PSI/200°F
Volume	10 cubic feet

CATION VESSELS

VESSEL DETAILS	
Identification	CN-K-IX03A/CN-K-IX03B
Number Installed	Two (2)
Manufacturer	CNSI
Installation	Vertical
Outside Diameter/Height, ft. in.	2 ft/4 ft. 5½ inch
Shell Thickness	3/16 inch
Shell Material	Stainless Steel
Design Pressure/Temperature	150 PSI/200°F
Volume	10 cubic feet

TABLE 3 (Cont'd.)

DEMINERALIZERS

LEAKAGE CONTAINMENT ION EXCHANGE VESSELS

VESSEL DETAILS	
Identification	CN-K-LC04A/CN-K-LC04
Number Installed	Two (2)
Manufacturer	CNSI
Installation	Vertical
Outside Diameter/Height, ft. in.	2ft/4ft 5½ inch
Shell Thickness	3/16 inch
Shell Material	Stainless Steel
Design Pressure/Temperature	150 PSI/200°F
Volume	10 cubic feet

POLISHING UNIT DEMINERALIZER

VESSEL DETAILS	
Identification	CN-K-PU05
Number Installed	One (1)
Manufacturer	CNSI
Installation	Vertical
Outside Diameter/Height, ft. in.	76"/79"
Shell Thickness	3/16"
Shell Material	Stainless Steel
Design Pressure, psi	Atmospheric
Volume	195 cubic feet
Weight	1850 lbs

TABLE 4

WASTE STORAGE TANKS

Identification	WDL-T-2A through 2D
Manufacturer	
Capacity - gallons	60,000 gal (total)
Installation	Horizontal
Outside Diameter/Height, ft., in.	
Shell Material	Stainless Steel
Shell Thickness, in.	
Design Temperature, ^{o}F	200^{o}F
Design Pressure, psig	14 psig
Corrosion allowance, in.	
Design Code	ASME Section VIII
Code Stamp Required	Not Stamped

TABLE 5

SDS MONITOR TANKS

Identification	SDS-T-1A & SDS-T-1B
Manufacturer	Buffalo Tank
No. Installed	Two (2)
Capacity - gallons	12,000 gallon each
Installation	Vertical
Outside Diameter/Height, ft.in.	8 ft./36 ft.
Shell Material	Stainless Steel
Shell Thickness, in.	3/16"
Design Temperature ^{o}F	amb.
Design Pressure, psig	atmospheric
Corrosion Allowance, in.	None
Design Code	ASME Sect. X
Code Stamp Required	ASME Sect. X

Revision 1
10/3/80

TABLE 6

SDS OFFGAS SEPARATOR TANK

Identification	CN-T-VA02
Manufacturer	APCO
No. Inatalled	One (1)
Capacity - gallons	590 gallons
Installation	Vertical
Outside Diameter/ Height, ft. in.	36 in./ 10 ft.
Shell Material	304 Stainless Steel
Shell Thickness, in.	3/16"
Design Temperature ^{o}F	100^{o}F
Design Pressure, psig	16 PSIG
Corrosion Allowance, in.	None
Design Code	ASME Sect VIII Div.1
Code Stamp Required	ASME Sect.VIII Div.1
HYDRO Pressure	24 PSIG
Shipping weight	1200 lbs.
Operating weight (full)	37,600 lbs.

Revision 1
10/3/80

(77)

CNSI--SDS

INSTRUMENT INDEX

2300-J-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	9/14/80	Additions and Corrections

JOB NO: 2300

BY:

APPROVED:

DATE: 5/22/80

SHEET 1 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. / SPEC.	RANGE/SETPOINT
CN-PI-FL01	PI-527-01	Filtration Manifold Influent Pressure gage	Filter Manifold L-527-1-14	527D A-5002		x	Ashcroft (1279S)	501-33978 DS-527-J-01	0-160 PSI
CN-PI-FL02	PI-527-02	Filter Influent Sample Pressure gage	Hi Rad Filter Sample Box	527D T 5012 527D A-5002	x		Ashcroft (1279S)	501-33978 DS-527-J-35	0-160 PSI
CN-PI-FL03	PI-527-03	Prefilter Influent Pressure gage	Filter Manifold L-527-1-1"	527D P 5009 527D A-5002		x	Ashcroft (1279S)	501-33978 DS-527-J-01	0-160 PSI
CN-PI-FL04	PI-527-04	Prefilter Effluent Pressure gage	Filter Manifold L-527-2-14"	527D P 5009 527D A-5002		x	Ashcroft (1279S)	501-33978 DS-527-01	0-160 PSI
CN-PI-FL05	PI-527-05	Final Filter Effluent Pressure gage	Filter Manifold L-527-7-14"	527D P 5009 527D A-5002		x	Ashcroft (1279S)	501-33978 DS-527-J-01	0-160 PSI
CN-PI-FL06	PI-527-06	Filter Effluent Sample Pressure gage	Hi Rad Filter Sample Box	527D T 5012	x		Ashcroft (1279S)	501-33978 DS-527-J-35	0-160 PSI
CN-PI-IX07	PI-527-07	Feed Pump Discharge Pressure gage	Feed Pump Manifold L-527-18-14"	527D A-5002			Ashcroft (1279S)	501-33978 DS-527-J-01	0-160 PSI
CN-PI-IX08	PI-527-08	IX Manifold Influent Pressure gage	IX Manifold L-527-18-1"	527D A-5001	x		Ashcroft (1279S)	501-33978 DS-527-J-01	0-160 PSI

Revision 1
10/3/80

(78)

CNSI--SDS

INSTRUMENT INDEX

2300-I-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections

JOB NO: 2300

BY:

APPROVED:

DATE: 5/22/80

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-PI-1X09	PI-527-09A	Train #1 IX "A" Effluent Pressure gage	IX Manifold L-527-55-½"	527D A-5001	x		Ashcroft (1279S)	501-31978 DS-527-J-01	0-160 PSI
CN-PI-1X10	PI-527-09B	Train #1 IX "B" Effluent Pressure gage	IX Manifold L-527-56-½"	527D A-5001	x		Ashcroft (1279S)	501-31978 DS-527-J-01	0-160 PSI
CN-PI-1X11	PI-527-09C	Train #1 IX "C" Effluent Pressure gage	IX Manifold L-527-26-1"	527D A-5001	x		Ashcroft (1279S)	501-31978 DS-527-J-01	0-160 PSI
CN-PI-1X12	PI-527-10A	Train #2 IX "A" Effluent Pressure gage	IX Manifold L-527-58-½"	527D A-5001	x		Ashcroft (1279S)	501-31978 DS-527-J-01	0-160 PSI
CN-PI-1X13	PI-527-10B	Train #2 IX "B" Effluent Pressure gage	IX Manifold L-527-59-½"	527D A-5001	x		Ashcroft (1279S)	501-31978 DS-527-J-01	0-160 PSI
CN-PI-1X14	PI-527-10C	Train #2 IX "C" Effluent Pressure gage	IX Manifold L-527-29-1"	527D A-5001	x		Ashcroft (1279S)	501-31978 DS-527-J-01	0-160 PSI
CN-PI-1X15	PI-527-11	Cation Effluent Pressure gage	IX Manifold L-527-35-1"	527D A-5001	x		Ashcroft (1279S)	501-31978 DS-527-J-01	0-160 PSI
CN-PI-1X16	PI-527-12	IX Manifold Flushline Pressure gage	IX Manifold L-527-45-1"	527D A-5001	x		Ashcroft (1279S)	501-31978 DS-527-J-01	0-160 PSI

CNSI--SDS

INSTRUMENT INDEX

2300-J-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 5/27/80

SHEET 1 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. / SPEC.	RANGE / SETPOINT
CN-PI-LC17	PI-527-13	Leakage Containment Pump Discharge Pressure gage	L-527-65-1"	527D A-5001		x	Ashcroft (12795)	501-33978 DS-527-J-02	0-60 PSI
CN-PI-LC18	PI-527-14A	Leakage Containment IX "A" Effluent Pressure gage	L-527-69-1½"	527D A-5001		x	Ashcroft (12795)	501-33978 DS-527-J-02	0-60 PSI
CN-PI-LC19	PI-527-14B	Leakage Containment IX "B" Effluent Pressure gage	L-527-70-1½"	527D A-5001			Ashcroft (12795)	501-33978 DS-527-J-02	0-60 PSI
CN-PI-PU20	PI-1	Polishing Unit Influent Pressure gage	Polishing Unit Skid	346-101	x		Ashcroft (10095)	NA NA	0-160 PSI
CN-PI-PU21	PI-8	Polishing Unit Filter Influent Pressure gage	Polishing Unit Skid	346-101	x		Ashcroft (10095)	NA NA	0-60 PSI
CN-PS-PU21	PS-1	Polishing Unit Filter Influent Pressure Switch	Polishing Unit Skid	346-101	x		Norcold	NA NA	10-150 PSI
CN-PAH-PU21	PAH-1	Polishing Unit Filter Influent Pressure High Alarm	Polishing Unit Control Panel	346-300 346-301	x		Sylvania (10152)	NA NA	45 PSIG
CN-PI-PU22	PI-10	Polishing Unit Filter Effluent Pressure gage	Polishing Unit Skid	346-101	x		Ashcroft (10095)	NA NA	0-60 PSI

Revision 1
10/3/80

(80)

CNSI--SDS

INSTRUMENT INDEX

2300-J-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 6/22/80

SHEET 4 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO / SPEC	RANGE/SETPOINT
CN-PI-PU23	PI-2	Polishing Unit Filter Air Purge Pressure gage	Polishing Unit Skid	346-101	x		Ashcroft (1009S)	NA / NA	0-30 PSI
CN-PI-PU24	PI-6	Polishing Unit Pumps Suction Pressure gage	Polishing Unit Skid	346-101	x		Ashcroft (1009S)	NA / NA	10" Hg-15 psig.
CN-PI-PU25	PI-3	Polishing Unit Effluent Pressure gage	Polishing Unit Skid	346-101	x		Ashcroft (1009S)	NA / NA	0-160 PSI
CN-PI-PU26	PI-4	Polishing Unit Service Air Pressure gage	Polishing Unit Skid	346-101	x		Ashcroft (1009S)	NA / NA	0-160 PSI
CN-PI-PU27	PI-5	Polishing Unit Service Water Pressure gage	Polishing Unit Skid	346-101	x		Ashcroft (1009S)	NA / NA	0-160 PSI
CN-PI-VA28	PSH/PSHH PI-527-18	Off Gas Header Influent Pressure gage, switch Hi, Switch Hi-Hi	L-527-1J-10"	527D A-5004			Dwyer (1015)	SQI-33817 / DS-527-J-06	(Trips CN-V-IX24) 0-15" H_2O
CN-PAH-VA28	PAH-527-18	Off Gas Header Influent Pressure High Alarm	EE-G-PAP-2 (Alarm Panel)	527D-A-5004 P-5008			Rosan (X2-100))	SQI-33848 / DS-527-J-31	5" H_2O

CNSI--SDS

INSTRUMENT INDEX

2300-I-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY: [illegible]

APPROVED: [illegible]

DATE: 6/22/80

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-PI-VA29	PI-527-16	Off Gas Blower Suction Pressure gage	L-527-13-10"	527D A-5004	x		Regal	501-33752 527-Y-5001	0-15" H_2O
CN-PI-VA30	PI-527-17	Off Gas Blower Discharge Pressure gage	L-527-13-10"	527D A-5004	x		Regal	501-33752 527-Y-5001	0-15" H_2O
CN-PSH-PU32	PS-2	Polishing Unit Fillhead Pressure Switch	Polishing Unit Fillhead	346-301 346-300	x			NA NA	45 PSIG
CN-PAH-PU32		Polishing Unit Fillhead Pressure High Alarm	Polishing Unit Control Panel	346-301 346-300	x			NA NA	45 PSIG
CN-PI-SA33	PI-527-27	Removable Sample Cylinder Pressure gage	Intermediate Sample Box	527D A-5006	x		Ashcroft (1000TA)	501-33978 DS-527-J-10	0-160 PSI
CN-PI-SA34	PI-527-26	Cation IA Effluent Sample Cylinder Pressure gage	Intermediate Sample Box	527D A-5006	x		Ashcroft (1000TA)	501-33978 DS-527-J-10	0-160 PSI

CNSI--SDS

INSTRUMENT INDEX

2300-J-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections

JOB NO: 2300

BY: C. L. Hussey

APPROVED:

DATE: 8/20/80

SHEET 6 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-PI-SA35	PI-527-25	Train #2 IX "C" Sample Cylinder Pressure gage	Intermediate Sample Box	527D A-5006	x		Ashcroft (1000TA)	501-33978 DS-527-J-10	0-160 PSI
CN-PI-SA36	PI-527-20	Train #1 IX "A" Sample Cylinder Pressure gage	Intermediate Sample Box	527D A-5006	x		Ashcroft (1000TA)	501-33978 DS-527-J-10	0-160 PSI
CN-PI-SA37	PI-527-21	Train #1 IX "B" Sample Cylinder Pressure gage	Intermediate Sample Box	527D A-5006	x		Ashcroft (1000TA)	501-33978 DS-527-J-10	0-160 PSI
CN-PI-SA38	PI-527-23	Train #2 IX "A" Sample Cylinder Pressure gage	Intermediate Sample Box	527D A-5006	x		Ashcroft (1000TA)	501-33978 DS-527-J-10	0-160 PSI
CN-PI SA39	PI-527-24	Train #2 IX "B" Sample Cylinder Pressure gage	Intermediate Sample Box	527D A-5006	x		Ashcroft (1000TA)	501-33978 DS-527-J-10	0-160 PSI
CN-PI SA40	PI-527-22	Train #1 IX"C" Sample Cylinder Pressure gage	Intermediate Sample Box	527D A-5006	x		Ashcroft (1000TA)	501-33978 DS-527-J-10	0-160 PSI
CN-PI-SA41	PI-527-28	Cation IX Influent Sample Cylinder Pressure gage	Intermediate Sample Box	527D A-5006	x		Ashcroft (1000TA)	501-33978 DS-527-J-10	0-160 PSI
CN-PI-SA42	PI-527-19	#1 Rad Feed Sample Pressure gage	#1 Rad Feed Sample Box	527D T 5018	x		Ashcroft (1279S)	501-33978 DS-527-J-35	0-160 PSI

CNSI--SDS

INSTRUMENT INDEX

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/21/80	Additions and Corrections

JOB NO: 2300
BY: Charles Holzemer
APPROVED: [signature]
DATE: 8/26/80

SHEET 7 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC	RANGE/SETPOINT
CN-PI-0W43	PI-527-30	Dewatering Station Drain Water Pressure gage	L-527-146-½"	527D A-5011			Ashcroft (1220)	501-34697 DS-527-J-52	0-160 PSI
CN-PI-0W44	PI-527-31	Dewatering Station Air Supply Pressure gage	L-527-143	527D A-5011			Ashcroft (1220)	501-34697 DS-527-J-52	0-160 PSI
CN-FE-1X01	FE-527-07	Feed Pump Discharge Flow Element	L-527-18-1"	527D A-5002	x		Fischer Porter (10LV 2201 AB3C)	501-33874 DS-527-J-19	NA
CN-FI/ FQI-1X01	FI/FQI 527-07	Feed Pump Discharge Flow Indicator/Totalizer	Feed Pump Manifold	527D A-5002	x		Fischer Porter (50 LV2114A2B)	501-33874 DS-527-J-19	0-20 gpm Indicator 7 digit Totalizer
CN-FO-1X02	FO-527-06	Feed Pump Recirc. Flow Orifice	Feed Pump Manifold L-527-21-3/4"	527D A-5002	x		Fluid Flow Products	501-33715 DS-527-J-14	NA
CN-FE-1X03	FE-527-09	Train #1 Influent Flow Element	L-527-19-1"	527D A-5001	x		Fischer Porter (50 LV2101 AB3 C)	501-33874 DS-527-J-19	NA
CN-FI/ FQI-1X03	FI/FQI 527-09	Train #1 Influent Flow Indicator/Totalizer	I.X. Manifold	527D A-5011	x		Fischer Porter (10 LV2114A2B)	501-33874 DS-527-J-19	0-20 gpm Indicator 7 digit Totalizer
CN-FE-1X04	FE-527-10	Train #2 Influent Flow element	L-527-22-1"	527D A-5001	x		Fischer Porter (10 LV2101AB3C)	501-33874 DS-527-J-19	NA

CNSI--SOS

INSTRUMENT INDEX

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
		8/14/80	Additions and Corrections

JOB NO: 3300

BY: Charles Holcomb

APPROVED: [illegible]

DATE: 8/25/80

SHEET 8 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-FI/ FQI-IX04	FI/FQI 527-10	Train #2 Influent Flow Indicator/Totalizer	I.X. Manifold	527D A-5001	x		Fischer Porter (501. V2114A2B)	501-33874 DS-527-J-19	0-20 gpm Indicator 7 digit Totalizer
CN-FE-LC05	FE-527-01	Prefilter Containment Flow Element	L-527-15-1"	527D A-5002	x		Fluid Flow Products (#301)	502-33715 DS-527-J-12	NA
CN-FI-LC05	FI-527-01	Prefilter Containment Flow Indicator	Containment Support Rack	527D A-5002		x	Dwyer (1223-36)	501-33817 DS-527-J-08	18-0-18 "H_2O
CN-FE-LC06	FE-527-02	Final Filter Containment Flow Element	L-527-15-1"	527D A-5002	x		Fluid Flow Products (#301)	501-33715 DS-527-J-12	NA
CN-FI-LC06	FI-527-02	Final Filter Containment Flow Indicator	Containment Support Rack	527D A-5002		x	Dwyer (1223-36)	501-33817 DS-527-J-08	18-0-18" H_2O
CN-FE-LC07	FE-527-09A	Train #1 IX "A" Containment Flow Element	L-527-65-1½"	527D A-5001	x		Fluid Flow Products (#301)	501-33715 DS-527-J-12	NA
CN-FI-LC07	FI-527-09A	Train #1 IX "A" Containment Flow Indicator	Containment Support Rack	527D A-5001		x	Dwyer (1223-36)	501-33817 DS-527-J-08	18-0-18" H_2O
CN-FE-LC08	FE-527-09B	Train #1 IX "B" Containment Flow Element	L-527-65-1½"	527D A-5001	x		Fluid Flow Products (#301)	501-33715 DS-527-J-12	NA

CNSI--SDS

INSTRUMENT INDEX

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections

JOB NO: 2300

BY: Charles Holcomb

APPROVED: [signature]

DATE: 8/25/80

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-PI-LC08	PI-527-09B	Train #1 IX "A" Containment Flow Indicator	Containment Support Rack	527D A-5001		x	Dwyer (1223-36)	501-33817 DS-527-J-08	18-0-18" H_2O
CN-PE-LC09	PE-527-09C	Train #1 IX "C" Containment Flow Element	L-527-65-2"	527D A-5001	x		Fluid Flow Products (#301)	501-33715 DS-527-J-12	NA
CN-PI-LC09	PI-527-09C	Train #1 IX "C" Containment Flow Indicator	Containment Support Rack	527D A-5001		x	Dwyer (1223-36)	501-33817 DS-527-J-08	18-0-18" H_2O
CN-PE-LC10	PE-527-10A	Train #2 IX "A" Containment Flow Element	L-527-65-2"	527D A-5001	x		Fluid Flow Products (#301)	501-33715 DS-527-J-12	NA
CN-PI-LC10	PI-527-10A	Train #2 IX "A" Containment Flow Indicator	Containment Support Rack	527D A-5001		x	Dwyer (1223-36)	501-33817 DS-527-J-08	18-0-18" H_2O
CN-PE-LC11	PE-527-10B	Train #2 IX "B" Containment Flow Element	L-527-65-3"	527D A-5001	x		Fluid Flow Products (#301)	501-33715 DS-527-J-12	NA
CN-PI-LC11	PI-527-10B	Train #2 IX "B" Containment Flow Indicator	Containment Support Rack	527D A-5001		x	Dwyer (1223-36)	501-33817 DS-527-J-08	18-0-18" H_2O
CN-PE-LC12	PE-527-10C	Train #2 IX "C" Containment Flow Element	L-527-65-3"	527D A-5001	x		Fluid Flow Products (#301)	501-33715 DS-527-J-12	NA

CNSI--SDS

INSTRUMENT INDEX

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	9/14/80	Additions and Corrections

JOB NO: 2300

BY: Charles Hartsough

APPROVED:

DATE: 8/26/80

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. / SPEC.	RANGE / SETPOINT
CN-FI-LC12	FI-527-10C	Train #2 IX "C" Containment Flow Indicator	Containment Support Rack	527D A-5001		x	Dwyer (1223-36)	501-33817 DS-527-J-08	18-0-18" H_2O
CN-FI-LC13	FE-527-11A	Cation IX "A" Containment Flow Element	L-527-65-3"	527D A-5001	x		Fluid Flow Products (#301)	501-33715 DS-527-J-12	NA
CN-FE-LC13	FI-527-11A	Cation IX "A" Containment Flow Indicator	Containment Support Rack	527D A-5001		x	Dwyer (1223-36)	501-33817 DS-527-J-08	18-0-18" H_2O
CN-FE-LC14	FE-527-11B	Cation IX "B" Containment Flow Element	L-527-65-3"	527-D A-5001	x		Fluid Flow Products (#301)	501-33715 DS-527-J-12	NA
CN-FI-LC14	FI-527-11B	Cation IX "B" Containment Flow Indicator	Containment Support Rack	527D A-5001		x	Dwyer (1223-36)	501-33817 DS-527-J-08	18-0-18" H_2O
CN-FT-PU15	FT-2	Polishing Unit Influent Flow Transmitter	Polishing Unit Skid	346-101	x		Fischer Controls (1151 DP)	NA NA	NA
CN-FI-PU15	FI-2	Polishing Unit Influent Flow Indicator	Polishing Unit Skid	346-101	x		Analog Devices	NA NA	0-999 gpm
CN-FO-PU15	OP-1	Polishing Unit Influent Flow Orifice	Polishing Unit Skid	346-101	x		Landish	NA NA	NA

Revision 1
10/3/80

(87)

CNSI--SDS

INSTRUMENT INDEX

NO.	BY	DATE	REVISION
0	CN	5/21/80	Initial Issue
1	CN	8/14/80	Additions and Corrections
2	CN	9/26/80	Setpoint Additions

JOB NO: 2300

BY: Charles Holquist

APPROVED: [signature]

DATE: 8/26/80

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. / SPEC.	RANGE / SETPOINT
CN-FQI-PU16	FM-1	Polishing Unit Effluent Flow Totalizer	Polishing Unit Skid	346-101	x		Brooks (9456)	NA / NA	7 digits
CN-FT-PU16	FT-1	Polishing Unit Effluent Flow Transmitter	Polishing Unit Skid	346-101	x		Action PAC	NA / NA	NA
CN-FI-PU16	FI-1	Polishing Unit Effluent Flow Indicator	Polishing Unit Skid	346-101	x		Analog Devices	NA / NA	0-999 gpm
CN-FI-VA17	FI-527-18	Off Gas Header Influent Flow Indicator	L-527-13-10"	527D A-5004	x		Dwyer Mark II	501-33172 / 527-Y-5001	0-7000 FPM
CN-FSL-PM18	FSL-527-101	Beta Monitor Manifold Effluent Flow Switch	L-527-103-1"	527D P-5009			Fluid Components (12-64-4)	501-33709 / DS-527-J-36	1.24 gpm
CN-FAL-PM18	FAL-527-101	Beta Monitor Manifold Effluent Lo Flow Alarm	Alarm Panel EE-CPAP-2	527D P-5008			Ronan (X2-1003)	501-33848 / DS-527-J-31	.15 GPM
CN-FI-SA19	FI-527-201	Off Gas Sample Station Air Supply Flow Indicator	Off Gas Sample Station	527D A-5004			Eberline (PING-1A)	501-34368 / DS-527-J-44	NA
CN-FI-SA20	FI-527-202	Off Gas Sample Station Sample Flow Indicator	Off Gas Sample Station	527D A-5004			Dwyer	501-34368 / DS-527-J-44	0-100 CPM

Revision 1
10/3/80
(88)

CNSI--SDS

INSTRUMENT INDEX

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1-	CH	9/14/80	Additions and Corrections

JOB NO: 2300

BY: Charles Holzwarth

APPROVED: [signature]

DATE: 8/25/80

SHEET 12 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
GN-FI-DW21	FI-527-31	Dewatering Station Air Purge Flow Indicator	L-527-143	527D A-5011			"SK" Instruments (1812J)	501-34691 DS-527-J-48	5-25 SCFM
GN-FQIC-DW2	FQIC-527-3	Dewatering Station Demin Water Flow Totalizer/ Controller	L-527-146	527D A-5011			Jersey Products Niagra Flow-meter(01810)	501-34693 DS-527-J-51	5-15 gpm 0-60 gal. totalizer

CNSI--SDS

INSTRUMENT INDEX

2100-I-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY: [signature]

APPROVED: [signature]

DATE: 5/22/80

SHEET 13 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-TE-1X01	TE-527-07	Feed Pump Discharge Line Temp. Element	L-527-1A-1"	5270 A-5002	x		Thermo Elec (TSC-2-J-1[illegible] C-316-26"-[illegible] (L-1"-1")	501-11937 DS-527-J-01	NA
CN-TI-1X01	TI-527-07	Feed Pump Discharge Line Temp. Indicator	Feed Pump Manifold	527D A-5002	x		Analogic Type "J" (PI-2452)	501-11873 DS-527-J-29	0-199.9°F.
CN-TI-PU02	TI-1	Polishing Unit Influent Temp. Indicator	Polishing Unit Skid	346-101	x		(AD-2026) Analog Devices	NA NA	0-999°F.
CN-TT-PU02	TT-1	Polishing Unit Influent Temp. Transmitter	Polishing Unit Skid	346-101	x		Action PAC	NA NA	NA
CN-TE-PU02	TE-1	Polishing Unit Influent Temp. Element	Polishing Unit Skid	346-101	x		Conax	NA NA	NA
CN-TAH-PU02	TAH-1	Polishing Unit Influent Temp. Alarm	Polishing Unit Control Panel	346-300 346-101	x		Analog Devices (AD-2026)	NA NA	125°F
CN-TI-VA01	TI-527-8	Off Gas Heater Influent Temp. Indicator	Off Gas Header L-527-11-10"	527D A-5004			Moeller (4900)	501-11752 527-Y-5001	25° - 125°F
CN-TE-VA04	TE-527-1A	Off Gas Heater Effluent Temp. Element	L-527-11-10"	527D A-5004			Moeller 4900	501-11752 527-Y-5001	NA

Revision 1
10/3/80

(90)

CNSI--SDS

INSTRUMENT INDEX

2300-I-001

NO.	BY	DATE	REVISION
0	CN	5/21/80	Initial Issue
1	CN	8/14/80	Additions and Corrections
2	CN	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 5/22/80

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO / SPEC.	RANGE / SETPOINT
CN-TI-VA04	TI-527-18	Off Gas Heater Effluent Temp. Indicator	Off Gas Header	527D A-5004			MSA	501-33752 527-Y-5001	0-400°F
CN-TSH-VA04	TSH-527-18	Off Gas Heater Effluent Temp. High Switch	Off Gas Header	527D A-5004			MSA	501-33752 527-Y-5001	200°F
CN-TAH-VA04	TAH-527-18	Off Gas Heater Effluent Temp. High Alarm		527D A-5004			MSA	501-33752 527-Y-5001	200°F
CN-TE-VA05	TE-527-19	Off Gas Heater Effluent Temp. Control Element	Off Gas Header	527D A-5004			MSA	501-33752 527-Y-5001	NA
CN-TIC-VA05	TIC-527-19	Off Gas Heater Effluent Temp. Instrument Controller	Off Gas Header in Control Panel	527D A-5004			MSA 3803-AIB-0C1101	501-33752 527-Y-5001	0-400°F
CN-TI-VA06	TI-527-18C	Charcoal Filter Temp. Indicator	Charcoal Filter	527D A-5004			Moeller (4900)	501-33752 527-Y-5001	50° - 400°F
CN-TI-RC07	TI-527-41	RCS Clean-Up Manifold Influent Temp. Indicator	RCS Clean-Up Manifold	527D A-5013			Analogic (PI-2452)	DS-527-J-29	0-199.9°F.
CN-TE-RC07	TE-527-41	RCS Clean-Up Manifold Influent Temp. Element	I-527-170	527D A-5013			Thermo Electric TSC-2-J-316-26"-IL-1"-1"	501-33957 DS-527-J-01	NA

CNSI--SDS

INSTRUMENT INDEX

2300-I-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 9/22/80

SHEET 15 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-DPSL/DPI-VA01	PDSL/PDI 527-01	Filter Manifold Containment DP Indicator/Switch	Filter Manifold	527D P-5009	x		Dwyer (3001)	501-33817 DS-527-J-05	0-1" H_2O/
CN-DPAL-VA01	PDAL-527-01	Filter Manifold Containment DP Low Alarm	Filter Manifold	527D P-5009	x		Ronan (X15-10015)	501-33848 DS-527-J-30	.25"
CN-DPSL/DPI-VA02	PDSL/PDI 527-02	Hi Rad Filter Sample Box DP Indicator/Switch	Hi Rad Filter Sample Box	527D P-5009	x		Dwyer (3001)	501-33817 DS-527-J-05	0-1" H_2O/
CN-DPAL-VA02	PDAL-527-02	Hi Rad Filter Sample Box DP Lo Alarm	Hi Rad Filter Sample Box	527D P-5009	x		Ronan (X15-10015	501-33848 DS-527-J-30	.25"
CN-DPSL/DPI-VA03	PDSL/PDI 527-06	Feed Pump Manifold Containment DP Indicator/Switch	Feed Manifold	527D P-5009	x		Dwyer (3001)	501-33817 DS-527-J-05	0-1" H_2O/
CN-DPAL-VA03	PDAL-527-06	Feed Pump Manifold Containment DP Lo Alarm	Feed Manifold	527D P-5009	x		Ronan (X15-10015)	501-33848 DS-527-J-30	.25"
CN-DPSL/DPI-VA04	PDSL/PDI 527-12	IX Manifold Containment DP Indicator/Switch	IX Manifold Shell	527D A-5001	x		Dwyer (3001)	501-33817 DS-527-J-05	0-1" H_2O/
CN-DPAL-VA04	PDAL 527-12	IX Manifold Containment DP Lo Alarm	Alarm Panel EE-GPAP-2	527D P-5008	x		Ronan (X2-1003)	501-33848 DS-527-J-11	.25"

CNSI--SDS

INSTRUMENT INDEX

2300-I-001

NO.	BY	DATE	REVISION
0	CH	9/21/80	Initial Issue
1	CH	9/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 9/29/80

SHEET 16 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
GN-DPI-VA05	PDI-527-18A	Off Gas Roughing Filter DP Indicator	Off Gas Header	527D A-5004			Dwyer (2001)	501-33752 527-Y-5001	0-1" H_2O
GN-DPI-VA06	PDI-527-18B	#1 Off Gas HEPA Filter DP Indicator	Off Gas Header	527D A-5004			Dwyer (2004)	501-33752 527-Y-5001	0-4" H_2O
GN-DPI-VA07	PDI-527-18C	Off Gas Charcoal Filter DP Indicator	Off Gas Header	527D A-5004			Dwyer (2003)	501-33752 527-Y-5001	0-3" H_2O
GN-DPI-VA08	PDI-527-18D	#2 Off Gas HEPA Filter DP Indicator	Off Gas Header	527D A-5004			Dwyer (2004)	501-33752 527-Y-5001	0-4" H_2O
GN-DPSL1 DPI-VA09	PDSL/PDI 527-20	Intermediate Sample Box DP Indicator/ Switch	Intermediate Sample Box Shell	527D A-5006			Dwyer (1001)	501-33817 DS-527-J-05	0-1" H_2O/
GN-DPAL-VA09	PDAL 527-20	Intermediate Sample Box DP Lo Alarm	Alarm Panel EE-GPAP-2	527D P-5008			Ronan (X2-1001)	501-33848 DS-527-J-31	.25"
GN-DPSL/ DPI-VA10	PDSL/PDI 527-14	Beta Monitor Containment DP Indicator/Switch	Beta Monitor Manifold	527D P-5009			Dwyer (1001)	501-33817 DS-527-J-05	0-1" H_2O/
GN-DPAL-VA10	PDAL 527-14	Beta Monitor Containment DP Lo Alarm	Alarm Panel EE-GPAP-2	527D P-5008			Ronan (X2-1001)	501-33848 DS-527-J-31	.25"

Revision 1
10/3/80

(93)

CNSI--SDS

INSTRUMENT INDEX

2300-J-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 5/22/80

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-DPSL/ DPI-VA11	PDSL/PDI 527-19	Hi Rad Feed Sample Box DP Indicator/Switch	Hi Rad Feed Sample Box	527D A-5001			Dwyer (3001)	501-33817 DS-527-J-05	0-1" H_2O/
CN-DPAL-VA11	PDAL 527-19	Hi Rad Feed Sample Box DP Lo Alarm	Alarm Panel EE-GPAP-2	527D P-5098			Ronan (X2-1001)	501-33848 DS-527-J-31	.25"
CN-DPSL/ DPI-VA12	PDSL/PDI 527-40	RCS Manifold Containment DP Indicator/Switch	RCS Manifold Containment	527D A-5013			Dwyer (3001)	501-33817 DS-527-J-05	0-1" H_2O/
CN-DPAL-VA12	PDAL 527-40	RCS Manifold Containment DP Lo alarm		527D A-5013			Ronan (X1S-1001 B)	501-33848 DS-527-J-30	.25"
CN-CE-PU01	CE-1	Polishing Unit Demin Effluent Conductivity Element	Polishing Unit Skid	346-101	x		UNILOC	NA NA	NA
CN-CT-PU01	CT-1	Polishing Unit Demin Effluent Conductivity Transmitter	Polishing Unit Skid	346-101	x		UNILOC	NA NA	NA
CN-CI-PU01	CI-1	Polishing Unit Demin Effluent Conductivity Indicator	Polishing Unit Control Panel	346-100 346-101	x		Analog Devices	NA NA	0-99.9 umhos/cm.

Revision 1
10/3/80

(94)

CNSI--SDS

INSTRUMENT INDEX

2300-J-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 5/22/80

SHEET 18 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-LS-PU01	LS-1	Polishing Unit Demin Level Switch	Polishing Unit Fillhead	346-101	x		De Laval Turbine Inc (LS-800-A) Type 3	NA / NA	NA
CN-LAHH-PU01	LAHH-1	Polishing Unit Demin Level Hi-Hi Alarm	Polishing Unit Control Panel	346-100 346-101	x		Sylvania (30152)	NA / NA	10"
CN-LT-PU02	LT-2	Polishing Unit Demin Level Transmitter	Polishing Unit Fillhead	346-101	x		De Laval Turbine Inc (XM-800-AA-SS-CN-18) Type 3	NA / NA	NA
CN-LI-PU02	LI-2	Polishing Unit Demin Level Indicator	Polishing Unit Control Panel	346-100 346-101	x		Analog Devices	NA / NA	0-18" From FIB
CN-LAH-PU02	LAH-02	Polishing Unit Demin Level Alarm High	Polishing Unit Control Panel	346-100 346-101	x		Sylvania (30152)	NA / NA	14"
CN-LAL-PU02	LAL-02	Polishing Unit Demin Level Alarm Lo	Polishing Unit Control Panel	346-100 346-101	x		Sylvania (30152)	NA / NA	24"
CN-LT-VA03	LT-527-01	Off Gas Separator Tank Level Transmitter	"B" Fuel Pool Surge Tank Skid	527D A-5004	x		Goulds	501-33179 / DS-527-J-34	NA
CN-LC-VA03	LCH/LCL -527-01	Off Gas Separator Tank Level Controller	"B" Fuel Pool Surge Tank Skid	527D A-5004	x		Moore Ind. (DCA/A-2CMA /D-XLR)/T 1 /117 VAC/	501-31876 / DS-527-J-32	NA

CNSI--SDS

INSTRUMENT INDEX

2300-J-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	9/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 5/22/80

SHEET 19 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-LSH-VA01	LSH-527-01	Off Gas Separator Tank Level Hi Switch	"B" Fuel Pool Surge Tank Skid	527D A-5004		x	Moore Ind. (DCA/4-20 MA/S-X1/1/ 117 VAC/Std	501-33876 DS-527-J-12	90%
CN-LAH-VA01	LAH-527-01	Off Gas Separator Tank Level Hi Alarm	Process Alarm Panel EE-C-PAP-2	527D A-500		x	Ronan (Relax Typ) (X2-1003)	501-33868 DS-527-J-31	90%
CN-LI-VA03	LI-527-01	Off Gas Separator Tank Level Indicator	"B" Fuel Pool Surge Tank Skid	527D A-5004	x		Moore Ind. (MM)	501-33876 DS-527-J-33	0-100%
CN-LE-FL06	LE-527-03	Filter Manifold Containment Sump Level Element	Filter Manifold	527D A-5002	x		Warrick (3R1C2)	501-33856 DS-527-J-15	NA
CN-LS-FL06	LC/LSH -527-03	Filter Manifold Containment Sump Level Switch	Filter Manifold	527D A-5002	x		Warrick (2C1G12)	501-33856 DS-527-J-15	2"
CN-LAH-FL06	LAH-527-03	Filter Manifold Containment Sump Level Hi Alarm	Filter Manifold	527D P-5009 527D P-5008			Ronan (X15-1001S)	501-33848 DS-527-J-30	2"
CN-LE-SA07	LE-527-04	Hi Rad Filter Sample Glove Box Sump Level Element	Inside Glove Box	527D P-5008			Warrick (3R1C2)	501-33856 DS-527-J-15	NA

CNSI--SDS

INSTRUMENT INDEX

2300-I-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	9/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 5/22/80

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-LS-SA07	LC/LSH 527-04	HI Rad Filter Sample Glove Box Sump Level Switch	Inside Glove Box	527D P-5008			Warrick (2111G12)	501-33856 DS-527-J-15	2"
CN-LSH-SA07	LSH-527-04	HI Rad Filter Sample Glove Box Sump Level Switch	On Glove Box	527DP-5008			Warrick (2C1G12)	501-33856 DS-527-J-15	2"
CN-LAH-SA07	LAH-527-04	HI Rad Filter Sample Glove Box Sump Level Alarm	On Glove Box	527D P-5008			Ronan (X-15-1001S)		2"
CN-LE-RC09	LE-527-43	RCS Manifold Containment Sump Level Element	In RCS Manifold Containment				Warrick (Conductance Type)	DS-527-J-15	NA
CN-LSH-RC09	LSH-527-43	RCS Manifold Containment Sump Level Switch	In RCS Manifold Containment				Warrick (Conductance Type)	DS-527-J-15	2"
CN-LAH-RC09	LAH-527-43	RCS Manifold Containment Sump Level HI Alarm	on RCS Manifold Containment				Ronan (X15-1001S)	DS-527-J-10	2"
CN-LCL-1X10	LCL-527-07	Feed Pump Shutdown Level Control Low Pressure Switch		527D A-5002		x	United Electric (JC-142)	501-33847 DS-527J-18(28)	0-18 PSIG

CNSI--SDS

INSTRUMENT INDEX

2300-J-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 5/22/80

SHEET 21 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-REL-FL01	RE-527-01A	Prefilter Containment Lo Range Radiation Element	Prefilter Containment Rack (submerged)	5270 A-5002		x	Tech. Assoc. (DMU-1000)	501-34556 DS-527-J-46	N/A
CN-REH-FL01	RE-527-01B	Prefilter Containment Hi Range Radiation Element	Prefilter Containment Rack (submerged)	5270 A-5002		x	Tech. Assoc. (DMU-1)	501-34556 DS-527-J-46	N/A
CN-RIT/RSH-FL01	RIT/RSH-527-01	Prefilter Containment Radiation Indicator/ Switch	Cask Support Platform Adjacent To Filter Manifold	5270 P-5009	x		Tech. Assoc. (CP-MU)	501-34556 DS-527-J-47	0-1 0-10 $0-10^2$ $0-10^3$ R/hr.
CN-RAH-FL01	RAH-527-01	Filter Containment Radiation Alarm (common)	Cask Support Platform	5270 P-5009	x		Ronan (X15-1001S1)	501-34263 DS-527-J-43	7×10^3 R
CN-REL-FL02	RE-527-02A	Final Filter Containment Lo Range Radiation Element	Final Filter Containment Rack (submerged)	5270 A-5002		x	Tech. Assoc. (DMU-1000)	501-34556 DS-527-J-46	N/A
CN-REH-FL02	RE-527-02B	Final Filter Containment Hi Range Radiation Element	Final Filter Containment Rack (submerged)	5270 A-5002		x	Tech. Assoc. (DMU-1)	501-34556 DS-527-J-46	N/A
CN-RIT/RSH-FL02	RIT/RSH 527-02	Final Filter Containment Radiation Indicator/ Switch	Cask Support Platform Adjacent to Filter Manifold	5270 P-5009	x		Tech. Assoc. (CP-MU)	501-34556 DS-527-J-47	0-1 0-10 $0-10^2$ $0-10^3$ R/hr.

Revision 1
10/3/80

(98)

CNSI--SDS

INSTRUMENT INDEX

2300-I-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 5/20/80

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VEN OR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-RE-1X01	RE-527-12	IX Manifold General Area Radiation Element	Top of RMP-1	527D A-5001	x		Eberline (DAI-4)	501-34368 DS-527-J-42	N/A
CN-RIC/RSH /RSHH-1X03	RIT/RSH/ RSHH/527-12	IX Manifold General Area Radiation Indicator/ Switch	RMP-1 Panel EE-CRMP-1	527D A-5001	x		Eberline (ECI-3)	501-34368 DS-527-J-42	1-10,000 mr/hr
CN-RAH/ RAHH-1X03	RAH/RAHH 527-12	IX Manifold General Area HI and HI-HI Alarm (Local Light)	RMP-1 Panel EE-CRMP-1	527D A-5001	x		Eberline RMS II-RU	501-34368 DS-527-J-42	Audible Alarm at CN-RA-AS15 5 mr/hr
CN-RE-1X04	RE-527-11	IX Manifold Effluent In Line Radiation Element	Inside IX Manifold on L-527-35-1"	527D P-5014		x	TGM (N-210-BNC)	501-34374 DS-527-J-38	N/A
CN-RT-1X04	RT-527-11	IX Manifold Effluent In Line Radiation Discriminator	RMP-1 Panel EE-CRMP-1	527D P-5014	x		Aston (205)	501-34374 DS-527-J-38	N/A
CN-RIT-1X04	RIT-527-11	IX Manifold Effluent In Line Radiation Indicator/Transmitter	RMP-1 Panel EE-CRMP-1	527D P-5014	x		Mech. Tronics (1254)	501-34374 DS-527-J-39	10-1M cps.
CNRSH-1X04	RSH-527-11	IX Manifold Effluent In Line Radiation HI Switch	RMP-1 Panel EE-CRMP-1	527D P-5014	x		Mech. Tronics (1254)	501-34374 DS-527-J-39	6000 cps
CNRAH-1X04	RAH-527-11	IX Manifold Effluent In Line Radiation HI Alarm	CN-RA-AS15	527D P-5014	x		NA	NA NA	Audible Alarm at CN-RA-AS15

CNSI--SDS

INSTRUMENT INDEX

2300-I-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 5/20/80

SHEET 23 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. / SPEC.	RANGE/SETPOINT
CN-RE-LC05	RE-527-13	Leakage Containment System Influent Radiation Element	L-527-65-3"	527D A-5001			TCH (N-21D-BNC)	501-14374 DS-527-J-38	N/A
CN-RY-LC05	RT-527-13	Leakage Containment System Influent Radiation Discriminator	RMP-1 Panel EE-CRMP-1	527D P-5014			Aaton (205)	501-14374 DS-527-J-38	N/A
CN-RIT-LC05	RIT-527-13	Leakage Containment System Influent Radiation Indicator/Transmitter	RMP-1 Panel EE-CRMP-1	527D P-5014			Mech. Tronics (1254)	501-14374 DS-527-J-39	10-1M cpm.
CN-RSH-LC05	RSH-527-13	Leakage Containment System Influent Radiation Hi Switch	RMP-1 Panel EE-CRMP-1	527D P-5014			Mech. Tronics (1254)	501-14374 DS-527-J-39	6000 cpm
CN-RAH-LC05	RAH-527-13	Leakage Containment System Influent Radiation Alarm HI	CN-RA-AS15	527D P-5014			NA	NA NA	Audible Alarm at CN-RA-AS15 6000 cpm
CN-RE-VA06	RE-527-18	Off Gas Header Influent Radiation Element	L-527-11-10"	527D A-5004			Eberline (DAI-1)	501-14368 DS-527-J-42	NA
CN-RIT-VA06	RIT-527-18	Off Gas Header Influent Radiation Indicator/ Transmitter	RMP-1 Panel EE-CRMP-1	527D J-5003			Eberline (ECI-1)	501-14368 DS-527-J-42	.01-100 mr/hr
CN-RSH-VA06	RSH-527-18	Off Gas Header Influent Radiation HI Switch	RMP-1 Panel EE-CRMP-1	527D J-5003			Eberline (ECI-1)	501-14368 DS-527-J-42	1.5 mr/hr

Revision 1
10/3/80
(100)

CNSI--SDS

INSTRUMENT INDEX

2300-J-001

NO.	BY	DATE	REVISION
0	CH	6/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 5/22/80

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. / SPEC.	RANGE/SETPOINT
CN-RAH-VA06	RAH-527-18	Off Gas Header Influent Radiation Hi Alarm	CN-RA-AS15	527D P-5008			NA	NA / NA	Audible Alarm at CN-RA-AS15
CN-RE-PH07	RE-527-109A	"A" Zeolite Beds Effluent Radiation Element	L-527-95-4"	527D P-5009			TGM (N-210-BMC)	501-14374 / DS-527-J-38	NA
CN-RY-PH07	RY-527-109A	"A" Zeolite Beds Effluent Radiation Discriminator	RMP-1 Panel EE-CRMP-1	527D P-5014			Aeton (205)	501-14374 / DS-527-J-38	NA
CN-RIT/RSH-PH07	RIT/RSH 109A	"A" Zeolite Beds Effluent Radiation Indicator/ Transmitter/Switch	RMP-1 Panel EE-CRMP-1	527D P-5014			Mech. Tronics (1254)	501-14374 / DS-527-J-39	16 Full Scale Ranges 10-1M cps.
CN-RAH-PH07	RAH-527-109A	"A" Zeolite Beds Effluent Radiation Alarm Hi	CN-RA-AS15	527D P-5014			NA	NA / NA	Audible Alarm at CN-RA-AS15 9×10^5 cps
CN-RE-PH08	RE-527-109B	"B" Zeolite Beds Effluent Radiation Element	L-527-97-4"	527D P-5009			TGM (N-210-BMC)	501-14374 / DS-527-J-38	NA
CN-RY-PH08	RY-527-109B	"B" Zeolite Beds Effluent Radiation Discriminator	RMP-1 Panel EE-CRMP-1	527D P-5014			Aeton (205)	501-14374 / DS-527-J-38	NA
CN-RIT/RSH-PH08	RIT/RSH 527-109B	"B" Zeolite Beds Effluent Radiation Indicator/ Transmitter/Switch	RMP-1 Panel EE-CRMP-1	527D P-5014			Mech. Tronics (1254)	501-14374 / DS-527-J-39	9×10^4 cps 16 Full Scale Ranges 10-1M cps.

Revision 1
10/3/80

(101)

CNSI--SDS

INSTRUMENT INDEX

2300-I-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 5/22/80

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-RAH-PM08	RAH-527-109B	"B" Zeolite Beds Effluent Radiation Alarm HI	CN-RA-AS15	527D P-5014			NA	NA NA	Audible Alarm at CN-RA-AS15 9×10^4 cps
CN-RE-PM09	RE-527-109C	"C" Zeolite Beds Effluent Radiation Element	L-527-99-½"	527D P-5009			TGM (N-210-BNC)	501-34374 DS-527-J-38	NA
CN-RY-PM09	RY-527-109C	"C" Zeolite Beds Effluent Radiation Discriminator	RMP-1 Panel EE-CRMP-1	527D P-5014			Aston (205)	501-34374 DS-527-J-38	NA
CN-RIT/RSH-PM09	RIT/RSH-527-109C	"C" Zeolite Beds Effluent Radiation Indicator/ Transmitter/Switch	RMP-1 EE-CRMP-1	527D P-5014			Mech. Tronics (1254)	501-34374 DS-527-J-39	16 Full Scale Ranges 10-1M cps.
CN-RAH-PM09	RAH-527-109C	"C" Zeolite Beds Effluent Radiation Alarm HI	CN-RA-AS15	527D P-5014			NA	NA NA	9×10^3 cps Audible Alarm at CN-RA-AS15
CN-RE-PM10	RE-527-111A	Cation Beds Influent Radiation Element	L-527-101-½"	527D P-5009			TGM (N-210-BNC)	501-34374 DS-527-J-38	NA
CN-RY-PM10	RY-527-111A	Cation Beds Influent Radiation Discriminator	RMP-1 Panel EE-CRMP-1	527D P-5014			Aston (205)	501-34374 DS-527-J-38	NA
CN-RIT/RSH-PM10	RIT/RSH 527-111A	Cation Beds Influent Radiation Indicator/ Transmitter/Switch	RMP-1 Panel EE-CRMP-1	527D P-5014			Mech. Tronics (1254)	501-34374 DS-527-J-39	16 Full Scale Ranges 10-1M cps.

Revision 1
10/3/80

(102)

CNSI--SDS

INSTRUMENT INDEX

2100-J-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 5/22/80

SHEET 26 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-RAH-PM10	RAH-527-111A	Cation Beds Effluent Radiation Alarm HI	CN-RA-AS15	5270 P-5014			NA	NA NA	Audible Alarm at CN-RA-AS15 9×10^2 cps
CN-RE-PM11	RE-527-111B	Cation Beds Effluent Radiation Element	1-527-102-½"	5270 P-5009			TQM (N-210-BNC)	SOI-36376 DS-527-J-[illegible]	NA
CN-RY-PM11	RY-527-111B	Cation Beds Effluent Radiation Discriminator	RMP-1 Panel EE-GRMP-1	5270 P-5014			Aston (205)	SOI-36376 DS-527-J-38	NA
CN-RIT/RSH-PM11	RIT/RSH 527-111B	Cation Beds Effluent Radiation Indicator/ Transmitter/Switch	RMP-1 Panel EE-GRMP-1	5270 P-5014			Mech. Tronics (1256)	SOI-36376 DS-527-J-39	16 Full Scale Ranges 10-1M cps
CN-RAH-PM11	RAH-527-111B	Cation Beds Effluent Radiation Alarm HI	CN-RA-AS15	5270 P-5014			NA	NA NA	Audible Alarm at CN-RA-AS15 9×10^2 cps

Revision 1
10/3/80

(103)

CNSI--SDS

INSTRUMENT INDEX

2300-J-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY: [illegible]

APPROVED: [illegible]

DATE: 5/22/80

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
	527-A-01	Packaged Off Gas Sampler System For Particulate Iodine and Noble Gas Air Monitoring.		527D A-5001			Eberline PING-1A	501-34368 DS-527-J-44	Includes 0.26 - 08 item #1
CN-RE-VA12	RE-527-201	Off Gas Particulate Sampler Radiation Element		527D A-5001			Beta Scintillation	501-34368 DS-527-J-44	NA
CN-RIT-VA12	RIT-527-201	Off Gas Particulate Sampler Radiation Indicator/Transmitter		527D A-5001				501-34368 DS-527-J-44	$1-10^6$ CPM
CN-RSH-VA12	RSH-527-201	Off Gas Particulate Sample Radiation Switch		527D A-5001				501-34368 DS-527-J-44	150 cpm
CN-RAH-VA12	RAH-527-201	Off Gas Particulate Sampler Radiation Alarm HI		527D A-5001				501-34368 DS-527-J-44	150 cpm
CN-RR-VA12	RR-527-201	Off Gas Particulate Sampler Radiation Recorder		527D A-5001				501-34368 DS-527-J-44	10 - 10^6 cpm
CN-RE-VA13	RE-527-202	Off Gas Charcoal Sampler Radiation Element		527D A-5001			NAL(TI)	501-34368 DS-527-J044	NA

Revision 1
10/3/80
(104)

CNSI--SDS

INSTRUMENT INDEX

2300-I-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	9/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE:

SHEET 28 OF 29

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-RIT-VA13	RIT-527-202	Off Gas Charcoal Sampler Radiation Indicator/ Transmitter	See page 26	5270 A-5001				501-34368 DS-527-J-44	1-10^6 CPH
CN-RSH-VA13	RSH-527-202	Off Gas Charcoal Sampler Radiation Switch HI							150 cpm
CN-RAH-VA13	RAH-527-202	Off Gas Charcoal Sampler Radiation Alarm HI							150 cpm
CN-RR-VA13	RR-527-202	Off Gas Charcoal Sampler Radiation Recorder							10 - 10^6 cpm
CN-RE-VA14	RE-527-203	Off G s Ion Chamber Sampler Radiation Element					Beta Scintilla-		NA
CN-RIT-VA14	RIT-527-203	Off Gas Ion Chamber Sampler Radiation Indicator/Transmitter							1-10^6 CPH
CN-RSH-VA14	RSH-527-203	Off Gas Ion Chamber Sampler Radiation Switch HI							150 cpm
CN-RAH-VA14	RAH-527-203	Off Gas Ion Chamber Sampler Radiation Alarm HI							150 cpm

Revision 1
10/3/80

(105)

CNSI--SDS

INSTRUMENT INDEX

2300-J-001

NO.	BY	DATE	REVISION
0	CH	5/21/80	Initial Issue
1	CH	8/14/80	Additions and Corrections
2	CH	9/26/80	Setpoint Additions

JOB NO: 2300

BY:

APPROVED:

DATE: 5/22/80

GPU NUMBER	CNSI NUMBER	DESCRIPTION	LOCATION	DRAWING REF.	INST'D CNSI	INST'D FIELD	VENDOR (MODEL)	P.O. NO. SPEC.	RANGE/SETPOINT
CN-RR-VA14	RR-527-203	Off Gas Ion Chamber Sampler Radiation Recorder					See page 26 Leeds & Northrupp		10 - 10^6 cpm
CN-RA-AS15	RAH-527-11	Common Alarm For RMP-1 EE-CRMP-1 (bell)	Surge Tank Skid Adjacent to Annunciator Panel	527D P-5009		x	Ronan (S86W)	501-34263 DS-527-J-43	N/A
CN-RR-RR16	RIR-527-01	Radiation Recorder	RMP-1 Panel EE-CRMP-1	527D 5012 527D-P-5013			Westronics (M II E)	501-34253 DS-527-J-40	N/A
CN-RE-IX17	RE-527-09	Train #1 "A" Bed Radiation Element	Train #1 "A" Bed Containment	527D-A-5001		x	Technical Associates (INV-1)	501-34556 DS-527J-46	N/A
CN-RE-IX18	RE-527-10	Train #2 "A" Bed Radiation Element	Train #2 "A" Bed Containment	527D-A-5001		x	Technical Associates (INV-1)	501-34556 DS-527J-46	N/A