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Attn: Document Control Desk

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Processed Water Storage and Recycle System
System Description, Rev. 3

Dear Sir:

Enclosed for your information is Revision 3 to the Processed Water Storage and Recycle System System Description. The revision reflects modification of the system piping to permit Borated Water Storage Tank water to feed the Processed Water Disposal System.

Sincerely,

R. L. Long
Director, Corporate Services/TMI-2

EDS/dlb
Enclosure

cc: T. T. Martin - Regional Administrator, Region I
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DIVISION

SYSTEM DESCRIPTION

FOR

Processed Water Storage and Recycle System

COG ENG 2/18/92 DATE 2/3/92

RTR 2.21.92 DATE 2/3/92

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GPU Nuclear

Title: Processed Water Storage and Recycle System	No. 3520-010 Rev 3
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Rev.	SUMMARY OF CHANGE	Approval	Date
1	Incorporated changes in the system description to reflect changes to P&ID 2-M74-PW-01. Changes include deletion of the connections to the demineralized service water system, containment decontamination water supply system, evaporator condensate test tanks, RC evaporator, and Unit 1 liquid waste disposal system; and connections from the demineralized service water system, resin trap, waste transfer pumps, and EPICOR II transfer pump. Incorporated ECA 3524-85-259. Added Tables 4 and 5, Instrument and Valve Lists.	/s/	10/86
2	Incorporated changes in the system description to reflect modifications for PWDS evaporator feed and return pathways.	DRB	11/92
3	Incorporated changes in the System Description to reflect modifications for Borated Water Storage Tank feed to the Processed Water Disposal System.	JJ	2/92

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SYSTEM DESIGN DESCRIPTION

1.0 DESIGN DESCRIPTION

1.1 SUMMARY

The primary function of the Processed Water (PW) Storage and Recycle System is to collect processed water from the Auxiliary Building Emergency Liquid Cleanup System (EPICOR II). The system also functions to collect processed water from the Submerged Demineralizer System (SDS) feed and monitor tank system. Secondary system functions are as follows:

a. Provide a source of processed water makeup for various tanks (e.g., Borated Water Storage Tank, WDL-T-9A/9B, Fuel Transfer Canal, Spent Fuel Pool "A")

b. Provide a source of processed water inside the RB via penetration R-565.

c. Provide staging tanks for the supply of processed water to and the collection of distillate from the Processed Water Disposal System (PWDS) evaporator.

Unless there is a component failure or inappropriate operator action, there is no direct liquid release pathway to the environment from the system.

Processed water system components include storage tanks, transfer pumps, and associated instrumentation, piping, and valves.

1.2 REFERENCES

1.2.1 Piping and Instrument Diagram (P&ID), Processed Water Storage and Recycle System, Drawing 2-M74-PW01.

1.2.2 General Arrangement/Area Piping, Processed Water Pump House, Drawing 2-POC-9021.

1.2.3 Piping Line Specifications, Standard 15737-2-P-001.

1.2.4 Piping Line Index, Standard 15737-2-P-002.

1.2.5 Recovery Facilities Plan, Drawing 2-COA-0001.

1.2.6 Technical Specification for Field-Erected Processed Water Storage Tanks, Document 13587-2-C-141.

1.2.7 Instruction Manual, Processed Water Transfer Pumps, Document 13587-2-M-080C-00021-01.

1.2.8 Technical Evaluation Report for the Processed Water Disposal System, Document 3232-019.

1.2.9 NUREG-0683, "Final Programmatic Environmental Impact Statement related to decontamination and disposal of radioactive wastes resulting from March 28, 1979, accident Three Mile Island Nuclear Station, Unit 2", March 1981.

1.3 DETAILED SYSTEM DESCRIPTION

1.3.1 Processed System Flowpaths (See Reference 1.2.1)

The PW storage tanks, PW-T-1 and PW-T-2, collect processed water from EPICOR II and the SDS feed and monitor tank system, and they can receive evaporator distillate from the PWDS. Processed water is transferred from EPICOR II via EPICOR II transfer pump ALC-P-5. The pump discharge line is routed from the chemical cleaning building to a common crossover inlet line to the storage tanks in the PW pump house (see Section 1.5). Isolation valves PW-V003 and PW-V004 on the crossover line permit selection of either tank for filling. The PW/EPICOR II system interface is in the chemical cleaning building.

The EPICOR II effluent line also functions as the flow path to recycle processed water to EPICOR II for further processing.

The SDS feed and monitor tank system transfer pumps, SDS-P-1A and SDS-P-1B, are used to deliver SDS processed water to the storage tanks. The PW system interfaces with the monitor tank transfer pump discharge header at valve PW-V039 in the Unit 1/Unit 2 corridor. From PW-V039, the effluent line is routed to a common crossover tank inlet line in the pump house, which contains isolation valves PW-V007 and PW-V008, to permit selection of either tank for filling.

The PWDS transfer pump, PW-P-3, delivers evaporator distillate to the processed water storage tanks. The pump, located in the Unit 1/Unit 2 corridor takes a suction on the PWDS interceptor tank (ALC-T-3). It discharges into the same effluent line as the SDS-P-1A and 1B at valve PW-V-107. This interfacing connection is located at the north end of the Unit 1/Unit 2 corridor.

Each of the storage tanks contains a drawoff sump to allow complete draining of each tank. Tank drain lines are double isolated and tee into the tank overflow lines. The common tank overflow line is routed to the chemical cleaning building sump.

Processed water transfer pumps PW-P-1 and PW-P-2 are used to transfer water from the PW storage tanks. Each transfer pump is provided with a separate suction line and startup strainer (PW-S-1 and PW-S-2). The suction lines are manifolded such that each tank may be used as a source of water for either transfer pump. Connected to the manifold is a 6-inch line routed from the pump house to the Unit 1/Unit 2 corridor where a valved/flanged connection is provided. A 3/4-inch line is tapped into this flanged connection downstream of valve PW-V047 and supplies processed water from either Processed Water Storage Tank (PWST) to the suction of PWDS feed pump, PW-P-4. Tied into the PW-P-4 suction line is a 3/4-inch line that permits feeding of water from the Borated Water Storage Tank (BWST) to the PWDS. The PWST recirculation line has a double isolated sample line connection which is directed to the sample sink in the pump house. The sample sink drain line discharge into the common overflow line from the storage tanks.

Transfer pump PW-P-2 is used primarily for tank recirculation. A restriction orifice, PW-U-2A, is provided in the tank recirculation to ensure the correct tank recirculation flow is obtained and to prevent pump runout. A portion of the line also functions as the minimum flow bypass line for pump PW-P-2. Valve PW-V076 is provided upstream of orifice PW-U-2A to direct flow through the minimum flow bypass line which contains orifices PW-U-2B and PW-U-2C in a series. Transfer pump PW-P-1 is provided with a minimum flow bypass line with series arranged orifices PW-U-1A and PW-U-1B. The minimum flow line of transfer pump PW-P-1 and the minimum flow/tank recirculation line of pump PW-P-2 tie in to a tank inlet manifold. The inlet lines extend into the tanks and contain two mixing eductors per tank.

The transfer pumps are provided with separate discharge lines and a common crossover line. The main processed water discharge header is routed from the pump house, through the yard, and into the Unit 1/Unit 2 corridor. The other pump discharge header ties in to the EPICOR II effluent line in the pump house between valves PW-V003 and PW-V004. The main

header ties into the 4-inch Once-Through-Steam-Generator (OTSG) chemical cleaning system line in the Unit 1/Unit 2 corridor. The OTSG line is modified with PW system piping added to allow PW to be transferred through the primary containment piping penetration R-565.

1.3.2 Major System Components

1.3.2.1 Processed Water Storage Tanks (see Appendix A, Table 1)

Two 500,000 gallon PWSTs (PW-T-1 and PW-T-2) are located in the yard (refer to Section 1.5). The tanks are atmospheric via open-ended 12-inch roof vents, and are non-Seismic Category I. Mixing of the liquid within the tanks is accomplished by pump recirculation and an eductor system. The mixing system provides representative sampling capability by recirculating the equivalent of three tank volumes in approximately 24 hours. Each tank contains two 3-inch Schutte and Koerting Co. type 268 eductors and associated internal piping and supports. The eductors are fully submerged at elevation 309'-5". Tank wetted nozzles, internal piping, and eductors are constructed of stainless steel.

The tanks are provided with freeze protection. The freeze protection consists of self-regulating heat tracing (Chemelex Auto Heat Trace System, 10 PTV-2 heater type) which encloses the bottom circumference of each tank, except the portions housed in the pump house. The heat tracing is covered by weatherproofed semirigid fiberglass insulation.

1.3.2.2 Processed Water Transfer Pumps (see Appendix A, Tables 2 and 3)

Two transfer pumps (PW-P-1 and PW-P-2) are provided for processed water pumping operations. The pumps are the single-stage, end suction/top discharge horizontal centrifugal type with stainless steel construction. Each pump is provided with a drip pan to collect any minor stuffing box leakage. Pump casing drains are valved and capped locally. Motors for the pumps are supplied with electrical service from motor

control center 2-31H.

1.3.2.3 Processed Water Disposal System Transfer Pumps (see Appendix A, Table 4)

Two additional transfer pumps are provided to service the PWDS evaporator. One pump (PW-P-3) supplies evaporator distillate back to the processed water storage tanks. The other (PW-P-4) supplies processed water feed from the processed water storage tanks or the borated water storage tank to the PWDS evaporator. The pumps are single stage close coupled design with mechanical seals. They are constructed of bronze and powered by 1-1/2 HP open drip proof motors. These pumps are both located in the Unit 1/Unit 2 corridor. They receive 120 volt power from the evaporator building switchgear via a 45 KVA transformer and power distribution panel PWD-MPD-P2.

1.3.3 Process System Design

Piping is designed, fabricated, and tested in accordance with ANSI B31.1, Power Piping Code. The portion of piping from the EPICOR II system tie-in up to and including isolation valve PW-V002 conforms to NRC Regulatory Guide 1.143, and is therefore classified as Important to Safety. System piping within the boundary of primary containment piping penetration R-565 is also Important to Safety. All other portions of the system are designated as Not Important to Safety.

System piping and valves are manufactured of austenitic stainless steel in accordance with Reference 1.2.3 for line specification HCD. Maximum operating and test pressures for the system piping and valves are provided in Reference 1.2.4.

The system design temperature range is 37 to 120°F based on the low set point of tank heat tracing and the maximum design temperature of the interfacing systems.

1.4 SYSTEM PERFORMANCE CHARACTERISTICS

System design flow rates are as follows:

Mode of Operation		Flow (gpm)
a.	Processed water delivery inside containment via a hose network from primary containment piping penetration R-565	200
b.	SDS feed and monitor tank system effluent delivery (transfer pumps SDS-P-1A and SDS-P-1B)	90
c.	EPICOR II (effluent - transfer pump ALC-P-5) (recycle - transfer pump PW-P-1)	 100 100
d.	Tank recirculation (transfer pump PW-P-2) (total PWST mixing flow, including eductor induced flow)	 275 1100
e.	Transfer pump PW-P-1 minimum flow bypass	30
f.	Transfer pump PW-P-2 minimum flow bypass	50
g.	Processed water delivery to the PWDS evaporator using PW-P-4	3 to 7
h.	Evaporator distillate return to PWSTs using PW-P-3	7 (cyclic)

Fluid temperatures in the tanks are maintained above 37° F using the tank freeze protection described in Section 1.3.2.1.

1.5 SYSTEM ARRANGEMENT

The storage tanks (PW-T-1 and PW-T-2) are located in the yard, outside the protected area and east of the Unit 2 power block, as shown in Reference 1.2.5. Located between the tanks is the PW pump house which houses the transfer pumps, sample sink, and tank isolation valves. The location of the components inside the pump house is shown in Reference 1.2.2.

1.6 INSTRUMENTATION AND CONTROL

1.6.1 Control Panels

Local control panel PW-LCP1, located in the PW pump house, is equipped with the following panel-mounted devices:

a. Indicators for liquid level and temperature in the storage tanks

b. Hand switches and indicator lights for the transfer pumps

c. Alarms for high tank level and pump thermal overload

In addition to the local control panel (PW-LCP1), system devices are also mounted on panel B in the main control room and on EPICOR II control panel ALC-PNL-1 in the TV monitor control building.

1.6.2 Level Transmitters

Level transmitters, PW-LT-2 and PW-LT-5, are provided to measure the liquid level in the tanks. Their output is transmitted to the level switches described in Sections 1.6.7 and 1.6.8, and the level indicators described in Section 1.6.4. Their output signal is 4 to 20 mA dc for a range of 0 to 500 inches H_2O.

1.6.3 Temperature Transmitters

Temperature transmitters, PW-TT-3 and PW-TT-6, are provided to sense the liquid temperature in the tanks. Their output is transmitted to the temperature indicators described in Section 1.6.5. Their output is 4 to 20 mA dc for a range of 0° to 150° F. The input to PW-TT-3 and PW-TT-6 is from resistance temperature detectors PW-TE-3 and PW-TE-6, respectively. The resistance for the range of 0 to 150 F is 93.03 to 125.37 ohms.

1.6.4 Level Indicators

Tank level indicators, PW-LI-2 and PW-LI-5, are provided on local control panel PW-LCP1. Their input signal and scale are 4 to 20 mA dc and 0 to 500 inches H_2O, respectively.

Varec series 2500, model B mechanical type level indicators, PW-LI-1 and PW-LI-4, are mounted on the side of the tanks, outside the pump house. Their range is 0 to 35 feet H_2O.

1.6.5 Temperature Indicators

Tank liquid temperature indicators, PW-TI-3 and PW-TI-5, are

provided on local control panel PW-LCP1. Their input signal and scale are 4 to 20 mA dc and 0° to 150° F, respectively.

1.6.6 Pressure Gauges

Pressure gauges, PW-PI-11 and PW-PI-12, are provided on the discharge lines of transfer pumps PW-P-1 and PW-P-2, respectively. Their range is 0 to 300 psig.

1.6.7 High Level Switches

Level switches, PW-LSH-2 and PW-LSH-5, are located in local control panel PW-LCP1 and actuate alarms on main control room panel 8, EPICOR II control panel ALC-PNL-1, and local panel PW-LCP1-1.

1.6.8 High-High Level Switches

Level switches, PW-LSHH-2 and PW-LSHH-5, are located in local panel PW-LCP1 and actuate alarms on main control panel 8 and EPICOR II panel ALC-PNL-1.

1.6.9 Low Temperature Switches

Temperature switches, PW-TSL-7 and PW-TSL-8, are provided to activate the tank heat tracing when the low set point is reached (setpoint given in Section 2.0). These switches are directly mounted on the tanks.

1.6.10 High Temperature Switches

Temperature switches, PW-TSH-7 and PW-TSH-8, are provided to deactivate the tank heat tracing when the high set point is reached (set point given in Section 2.0). These switches are directly mounted on the tanks.

1.6.11 Hand Indicating Switches

Hand indicating switches, PW-HIS-9, PW-HIS-10, PW-HIS-9A, PW-HIS-10A, PW-HIS-9B, and PW-HIS-10B, are provided for the transfer pumps. Switches PW-HIS-9 and PW-HIS-10 provide local start/stop control and are mounted on local control panel PW-LCP1. Switches PW-HIS-9B and PW-HIS-10B provide remote start/stop control and are mounted on panel B in the main control room. Switches PW-HIS-9A and PW-HIS-10A are also mounted on control room panel 8 and function to block pump control from the pump house.

1.6.12 Level Test Connections

Each tank is equipped with a level test connection.

1.6.13 Pressure Test Connections

The suction line of each transfer pump is equipped with a pressure test connection to verify pump performance.

1.6.14 Flow Test Connections

Minimum flow bypass lines of the transfer pumps and the tank recirculation line are equipped with orifice flanges/plates with pressure tap openings. In the minimum flow bypass mode, the flow test connections provide a means of verifying that the minimum safe pump bypass flow is obtained. In the tank recirculation mode, the flow test connection provides a means of determining tank recirculation flow rate.

1.6.15 Annunciators

High tank level alarms are provided and are mounted on their respective control panels as follows:

Alarms	Control Panels
PW-LAH-2 and PW-LAH-5	PW-LCP1
PW-LAH-2A and PW-LAH-5A	Main Control Room Panel 8
PW-LAH-2B and PW-LAH-5B	ALC-PNL-1

Alarms PW-LAH-2A, PW-LAH-2B, PW-LAH-5A and PW-LAH-5B also annunciate for high-high tank level on their respective panels. The PW transfer pump motors are provided with thermal overload protection with alarms PW-TAH-9 and PW-TAH-10 located on panel PW-LCP1.

1.7 SYSTEM INTERFACES

The PW storage and recycle system interfaces with the following systems:

a. EPICOR II

b. SOS Feed and Monitor Tank System

c. OTSG Chemical Cleaning System

d. Processed Water Disposal System Evaporator

1.7.1 The system is designed primarily to provide storage capacity for processed water transferred from EPICOR II, and to a lesser extent the SDS feed and monitor tank system. The system is also capable of recycling water to EPICOR II for further processing.

1.7.2 The system provides a source of feed water to the PWDS evaporator and can also receive evaporator distillate when the PWDS is operating in a decoupled mode.

1.7.3 The tie-in to the OTSG chemical cleaning system is provided to use a portion of the system as a processed water supply header in the Unit 1/Unit 2 corridor and in the auxiliary building.

2.0 SYSTEM LIMITATIONS, SET POINTS, AND PRECAUTIONS

2.1 The tanks are provided with high and high-high level alarms as described in Section 1.6.15. The high and high-high tank level set points are 405 and 411 inches, respectively, from the bottom of the tank. The liquid level in the tanks is monitored prior to and during pumping operations. Tank level indications are based on a zero reference at the bottom of the tanks. Level connections are located 24 inches above the bottom of the tanks.

2.2 The tanks are provided with low and high temperature switches (described in Sections 1.6.9 and 1.6.10, respectively) to limit operation of the tank heat tracing. The low and high temperature setpoints are 37° and 42° F, respectively.

2.3 The contents of radioactivity stored in each tank are limited such that a tank failure would not result in greater than 10 CFR Part 20, Appendix B, Table II, Column 2 concentrations at the nearest drinking water intake for combined radionuclides as a function of actual volume. This limit is quantified using the following formula, which is given in the Programmatic Environmental Impact Statement (Reference 1.2.9), Section 7.2.4.2:

$$\Sigma \frac{Ai}{MPC_i} \leq 6.4 \times 10^6 \ (Ci/\mu Ci/ml)$$

Where:

A_i = tank activity prior to rupture (curies)

MPC_i = maximum permissible concentration (10 CFR Part 20, Appendix B, Table II, Column 2 - μCi/ml)

2.4 To ensure that only water of proper chemistry and isotopic concentration is delivered from the system, sampling is required prior to transferring processed water to an interfacing system and/or into the reactor building. However, sampling is not required after the initial sample if no additional water is transferred to the tanks.

2.5 System operators should be aware of the following:

a. Storage tank water chemistry

b. Valve alignments

c. Transfer pump discharge pressure

d. Radiation levels in the vicinity of the tanks following each transfer of water to the tanks

e. Radionuclide concentrations of processed water to be transferred from the tanks.

3.0 OPERATIONS

3.1 INITIAL FILL

Prior to filling the preselected tank, the proper valve lineup is selected on the influent lines and the tank level noted. The water chemistry and isotopic concentration of any effluent transferred to the storage tanks are determined prior to delivery.

The high point vent on the EPICOR II effluent line is opened prior to pumping operations via EPICOR 1I transfer pump ALC-P-5 to enable air trapped in the system piping to escape.

3.2 STARTUP

Radiation levels in the vicinity of the tanks are monitored following each transfer of water to the tanks.

Prior to recirculating the contents of a preselected tank, the proper valve lineup is selected on the pump suction lines and on the tank recirculation/minimum flow bypass line of transfer pump PW-P-2. After the tank contents have been recirculated, the proper valve lineup is selected on the suction, minimum flow, and discharge lines of the preselected transfer pump. Process line high point vents are opened prior to pump operations to enable air trapped in the system piping to escape.

After initial system flushing, startup strainers PW-S-1 and PW-S-2 should be removed and spacer rings installed.

3.3 NORMAL OPERATIONS

Normal operations of the system is on a batch mode basis. After one storage tank has received a batch, it is isolated and the contents recirculated, the associated sample line purged, and the fluid sampled (refer to Section 2.4). Based on the chemistry and radiological results of the sample, the tank contents are either transferred for use or routed to EPICOR II for further processing. While the preselected tank is being recirculated, sampled, and transferred, the second tank is available to receive an effluent stream.

If the contents of a tank are within the limits described in Reference 1.2.8, they can be transferred to the Processed Water Disposal System for evaporation. In addition, the PWDS can discharge effluent to a processed water storage tank as described in Reference 1.2.8.

Automatic control of the system is used where necessary for safe system operation, such as preventing tank contents from freezing. Other operations are accomplished by manual and remote manual control, since operations of these types mainly involve intermittent batch type operations.

Under normal operation, the transfer pumps use the suction lines containing tank isolation valves PW-V011 and PW-V012 when the water level is above 47 inches from the bottom of the tanks. Below the 47-inch elevation, the tank drawoff sump drain lines are used. Operation of the transfer pumps is in accordance with Reference 1.2.7. During normal modes of operation, each of the following system requirements is satisfied by the noted transfer pump:

Modes of Operation		Transfer Pump
a.	Tank recirculation	PW-P-2*
b.	EPICOR II recycle	PW-P-1
c.	Processed water delivery inside containment via hose network from primary containment piping penetration R-565	PW-P-1 or PW-P-2
d.	Processed water feed to the PWDS	PW-P-4

e. Evaporator distillate return to PWSTs PW-P-3

* Restriction orifices are sized based on operation of this transfer pump

3.4 SHUTDOWN

Flow to a storage tank may be discontinued by shutting off the feed pump in operation (EPICOR II transfer pump ALC-P-5, SDS monitor tank transfer pumps SDS-P-1A or SDS-P-1B, Evaporator return pump PW-P-3) and isolating the open flow path.

Operation of the PW transfer pumps (PW-P-1 and PW-P-2) may be discontinued by use of hand switches PW-HIS-9B or PW-HIS-10B, which are located in the main control room. Operation of the pumps may also be discontinued by use of hand switches PW-HIS-9 and PW-HIS-10, which are located in the PW pump house. Switches PW-HIS-9 and PW-HIS-10 may only be used if the related block switches in the main control room, PW-HIS-9A and PW-HIS-10A, are properly aligned.

Operation of the PWDS transfer pumps PW-P-3 and PW-P-4 is from local hand switches in the Unit 1/2 corridor.

3.5 DRAINING

Where required, process system lines are equipped with 1-inch low point drains to drain system piping.

Each storage tank is equipped with a drawoff sump and an associated drain line (tank pump down line) to permit complete draining of each tank. Part of the tank contents may be gravity drained to the 4,000-gallon capacity chemical cleaning building sump via the common overflow/drain line. When pumping down the tanks, caution shall be used to prevent cavitation of the transfer pump in operation.

Transfer pumps, PW-P-1 and PW-P-2, are equipped with casing drains that are piped and capped locally in the pump house. Pump casings should be drained when required, with the containers disposed of in a suitable location.

3.6 REFILLING

Prior to refilling a fully drained storage tank, the operations (described in Section 3.1) used for initial tank filling are executed.

3.7 INFREQUENT OPERATIONS

Redundant transfer pumps are not provided. With one pump out of service, the other pump is not used unless an evaluation concludes that the operational pump may be used to satisfy the specific application. This is necessary due to the differential in design capacity and total head (refer to Appendix A, Tables 2 and 3).

3.8 TRANSIENT OPERATIONS

If a loss of power transient in the PW pump house were to occur, operation of the transfer pumps would be discontinued and the high/high-high tank level alarms in the main control room and in the TV monitor control building would annunciate.

4.0 CASUALTY EVENTS AND RECOVERY PROCEDURES

4.1 CASUALTY EVENTS

The system does not impact on plant fire safety.

Possible system casualty events include the following:

a. System leakage

b. High radiation level

c. Transfer out-of-specification water

d. PW storage tank overfill

4.2 DESIGN FEATURES TO MITIGATE EFFECTS OF CASUALTY EVENTS

4.2.1 The pump house is designed to contain any minor leakage of processed water in the structure to prevent leakage to the environment.

4.2.2 The system is designed with the capability to recycle batches to EPICOR II if further processing is required. Radiation levels in the vicinity of the tanks are monitored following each transfer of water to the tanks. These levels are controlled such that the dose rate will not exceed 0.6 mrem/hr at the east edge of the access road to the west of the tanks. The contents of radioactivity stored in each

tank are limited per Section 2.3.

4.2.3 Sampling capability exists in the system to prevent out-of-specification water from being discharged from the tanks.

4.2.4 Each PW tank is provided with an overflow line and a high/high-high level alarm.

4.3 RECOVERY PROCEDURES

4.3.1 Recovery from a system leakage casualty event involves isolation of the leak and collection of the spill.

4.3.2 Recovery from a high radiation casualty event entails roping off an area around the tanks to alert personnel that radiation dosimetry is required to be worn to enter that area, and furthermore, transferring the effluent to EPICOR II for further processing.

4.3.3 Recovery from a casualty event in which out-of-specification water is discharged involves stopping the pump in operation, isolating the flow path and source tank, and isolating the affected area or component.

4.3.4 Recovery from a PW storage tank overfill condition entails stopping the feed pump in operation, isolating the flow path, and using a PW transfer pump to partially drain the overfilled tank.

5.0 MAINTENANCE

5.1 MAINTENANCE APPROACH

Minimal maintenance is expected on the system. Maintenance requirements can be categorized into the following general areas:

a. Tank maintenance

b. Transfer pump maintenance

c. Valve maintenance

d. Instrument maintenance

Existing plant maintenance procedures are used where possible along with vendor maintenance instructions.

5.2 CORRECTIVE MAINTENANCE

If repair welding is done to any pressure retaining part of component of the system, it is to be done in accordance with the procedures used for initial construction. Upon completion, the specific part of component is leak tested per ANSI B31.1.

Transfer pump corrective maintenance is in accordance with Reference 1.2.7 for pumps PW-P-1 and PW-P-2. Other system components are maintained in accordance with applicable manufacturers instruction manuals.

5.3 PREVENTIVE MAINTENANCE

Transfer pump preventive maintenance is in accordance with Reference 1.2.7 for pumps PW-P-1 and PW-P-2. Other components are maintained in accordance with applicable manufacturers instruction manuals.

Active components, including pumps, valves, and motors, are routinely inspected to spot potential problem areas.

6.0 ACCEPTANCE TESTING

The storage tanks are field hydrostatically tested in accordance with Reference 1.2.6.

The transfer pumps are shop hydrostatically tested in accordance with manufacturers' standard procedures.

System piping and valves are field hydrostatically tested to the test pressures noted in Reference 1.2.4.

Acceptance testing shall be in accordance with existing plant procedures.

APPENDIX A

TABLE 1

PROCESSED WATER STORAGE TANKS

Tank Detail	
Identification	PW-T-1 and PW-T-2
Manufacturer	Pittsburgh - Des Moines Steel Co.
Capacity (per tank), gallons	500,000
Installation	Vertical
Outside diameter, feet	50
Straight shell height, feet	36
Shell material	ASME SA285, Grade C carbon steel
Interior lining	Epoxy-phenolic type
Shell thickness, inches	3/8
Design temperature, °F	40 - 120
Design pressure	Atmospheric
Corrosion allowance, inches	1/16 (shell) and 1/8 (floor)
Design code	API-650

APPENDIX A

TABLE 2

PROCESSED WATER TRANSFER PUMP PW-P-1

Pump Details (see Figure 1 for Pump Performance Curve)

Identification	PW-P-1
Manufacturer	Goulds
Model Number	3196 ST
Type	Single state horizontal centrifugal
Rated speed, rpm	3500
Rated capacity, gpm	160
Rated total dynamic head, feet	255
Shutoff head, feet	280
Shaft seal	Mechanical - single inside type (John Crane Type 1 with tungsten carbide seal faces)
Lubricant	Oil

Motor Details

Manufacturer	Reliance
Type	Induction
Enclosure	ODP
Rated horsepower, hp	25
Speed, rpm	3600
Insulation class	B
Service	Continuous duty
Service factor	1.15
Lubricant/coolant	Grease/air
Power requirements	460 volts, 3 phase, 60 Hz

APPENDIX A

TABLE 3

PROCESSED WATER TRANSFER PUMP PW-P-2

Pump Details (see Figure 2 for Pump Performance Curve)

Identification	PW-P-2
Manufacturer	Goulds
Model Number	3196 ST
Type	Single stage horizontal centrifugal
Rated speed, rpm	3550
Rated capacity, gpm	250
Rated total dynamic head, feet	270
Shutoff head, feet	305
Shaft seal	Mechanical - single inside type (John Crane Type 1 with tungsten carbide seal faces)
Lubricant	Oil

Model Details

Manufacturer	Reliance
Type	Induction
Enclosure	ODP
Rated horsepower, hp	30
Speed, rpm	3600
Insulation class	B
Service	Continuous duty
Service factor	1.15
Lubricant/coolant	Grease/air
Power requirements	460 volts, 3 phase, 60 Hz

APPENDIX A

TABLE 4

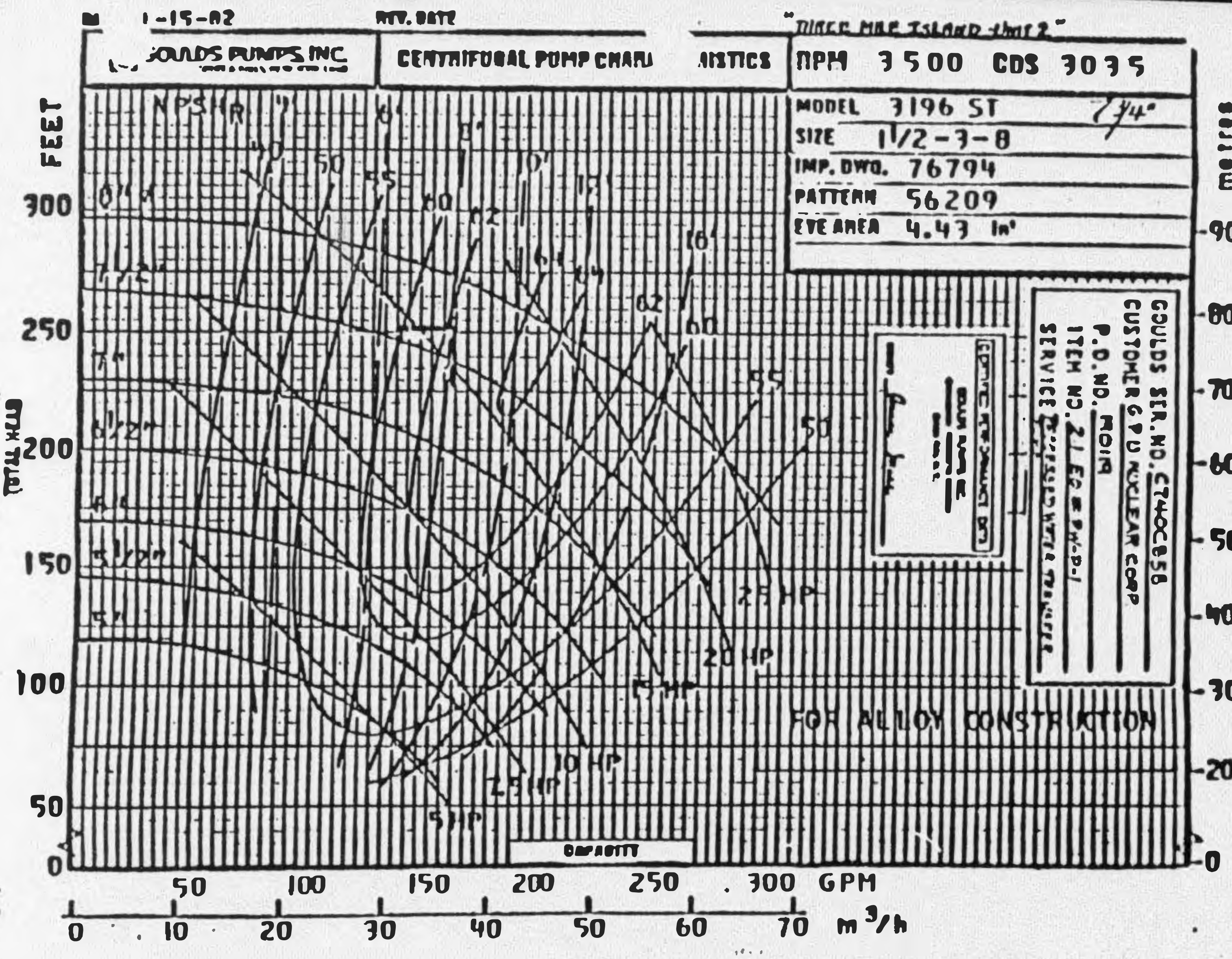
PROCESSED WATER TRANSFER PUMPS PW-P-3 AND PW-P-4

Pump Details (see Figure 3 for Pump Performance Curve)

Identification	PW-P-3/PW-P-4
Manufacturer	Price Pump Company
Model Number	HP-75-150
Type	Single Stage Close Coupled Centrifugal
Rated Speed, rpm	3600 (nominal)
Rated Capacity, gpm	7
Rated TDH, feet	148
Shutoff Head, feet	165

Motor Details

Manufacturer	Baldor
Type	Induction
Enclosure	ODP
Rated Horsepower	1 1/2
Speed, HP	3450
Insulation Class	B
Service	Continuous
Service Factor	1.3
Lubricant/Coolant	Grease/Air
Power Requirements	120 volt, single phase, 60 Hz



APPENDIX A
FIGURE 1
PROCESSED WATER TRANSFER PUMP PW-P-1

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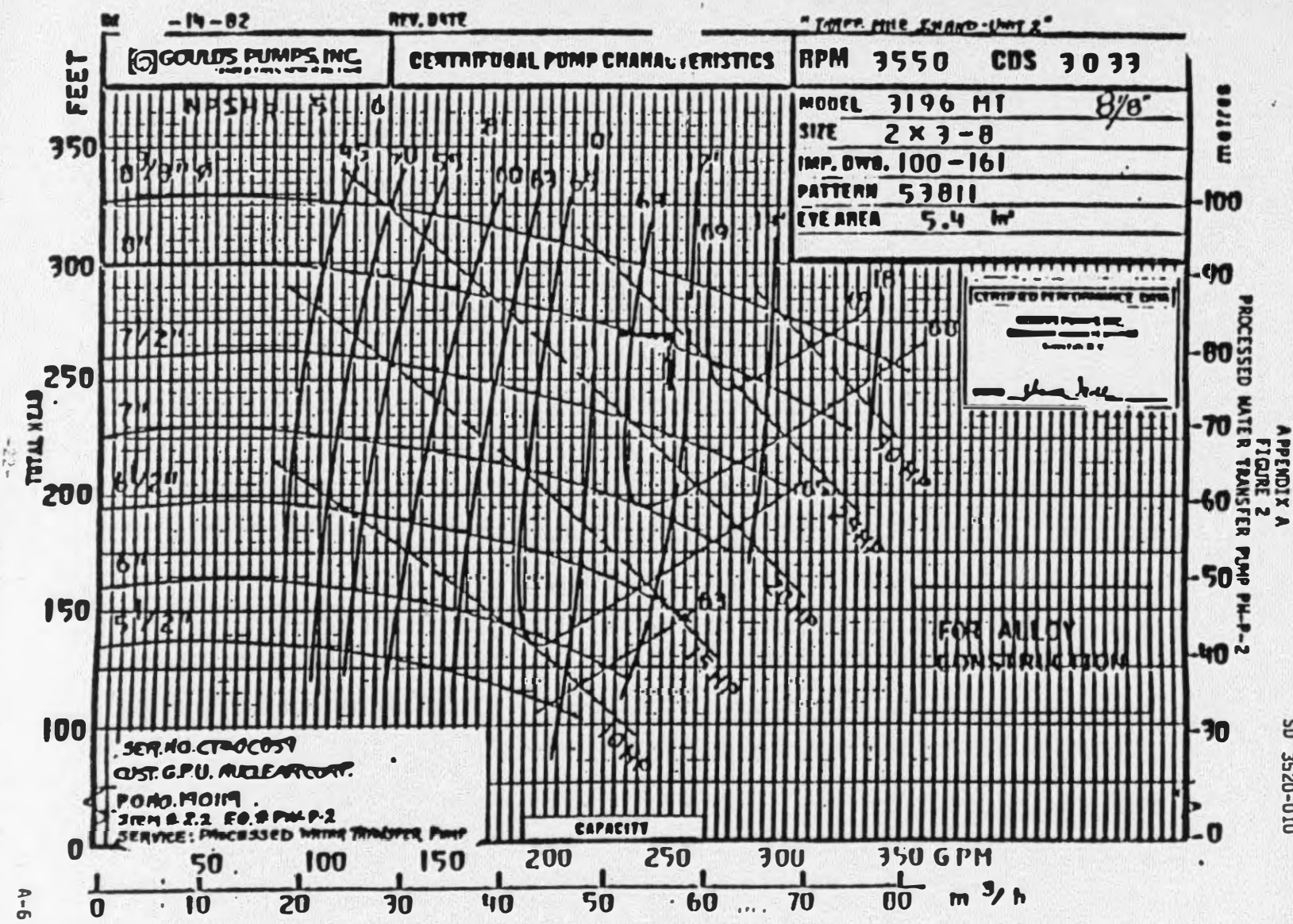

APPENDIX A
FIGURE 2

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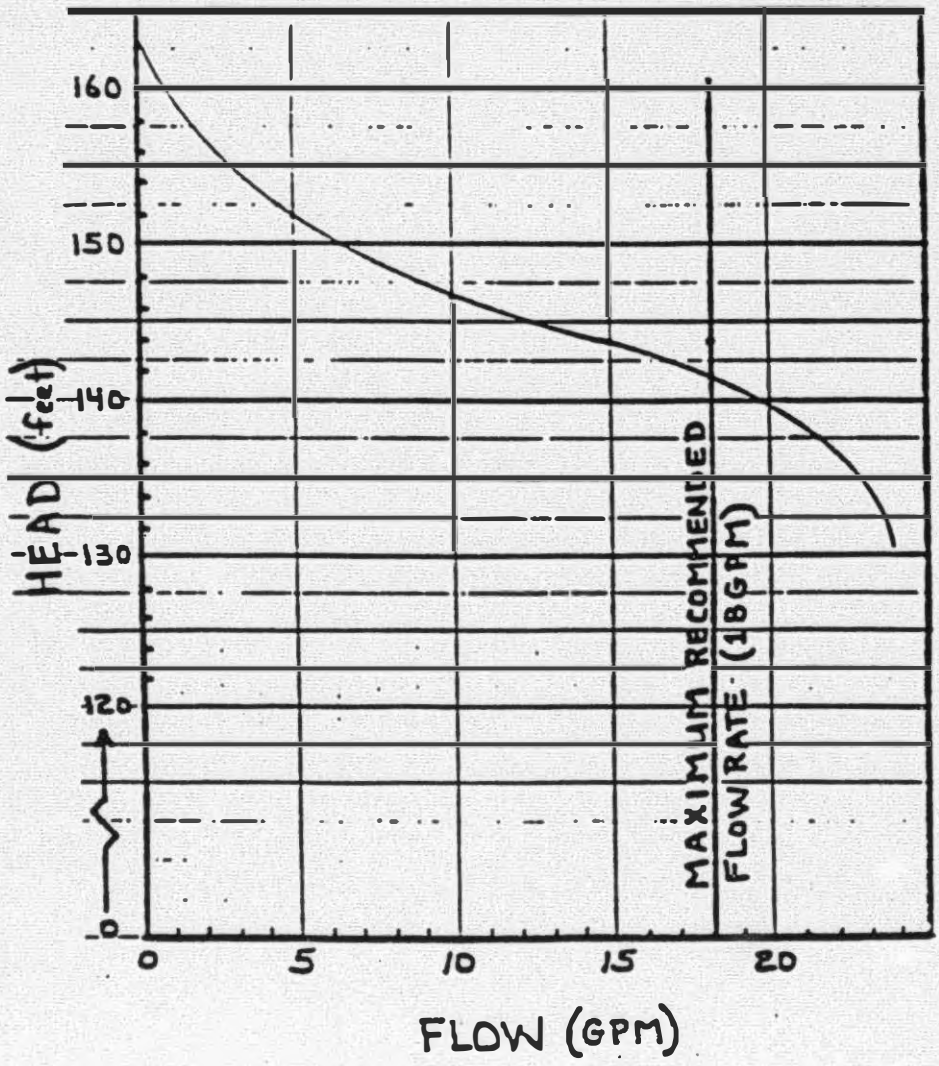
APPENDIX A

FIGURE 3

PROCESSED WATER TRANSFER PUMPS PW-P-3 AND PW-P-4



APPENDIX A - TABLE 5
PROCESSED WATER

INSTRUMENT INDEX

Tag No.	Service	Location	Supplier	Model No.	Input/Span Output/Scale	Set Point	Remarks
PW-LI-1	PW-T-1 Level	Yard	VAREC	2500 Mod B	0-35' WC 0-35' WC	N/A	Mechanical
PW-LAH-2	PW-T-1 Level Hi	PW-LCP1	RIS	AN3100	N/A	N/A	
PW-LAH-2A	PW-T-1 Level Hi/Hi-Hi	CR-PNL8	RIS		N/A	N/A	
PW-LAH-2B	PW-T-1 Level Hi/Hi-Hi	ALC-PNL-1			N/A	N/A	
PW-LI-2	PW-T-1 Level	PW-LCP1	Sigma	1151VB420	4-20 MADC 0-500" WC	N/A	
PW-LSH-2	PW-T-1 Level Hi	PW-LCP1	Foxboro	63U-BT-OJDR	4-20 MADC N/A	405" WC (I)	
PW-LSHH-2	PW-T-1 Level Hi-Hi	PW-LCP1	Foxboro	63U-BT-OJDR	4-20 MADC N/A	411" WC (I)	
PW-LT-2	PW-T-1 Level	Local (PWPH)	Foxboro	E13DM3DISAH1	0-500" WC 0-20 MADC	N/A	
PW-TE-1	PW-T-1 Temperature	Local (PWPH)	Rosemount	78N21N01N135	0-150 F 93.03-125.37Ω	N/A	
PW-TI-3	PW-T-1 Temperature	PW-LCP1	Sigma	1151VB420	4-20 MADC 0-150 F	N/A	
PW-TT-1	PW-T-1 Temperature	Local (PWPH)	Rosemount	444RL2U1A1NA	93.03-125.37Ω 4-20 MADC	N/A	
PW-TW-1	PW-T-1 Temperature	Local (PWPH)	Pyco	16-5019-12"	N/A	N/A	
PW-LI-4	PW-T-2 Level	Yard	VAREC	2500 Mod B	0-35' WC 0-35' WC	N/A	Mechanical
PW-LAH-5	PW-T-2 Level Hi	PW-LCP1	RIS	AN3100	N/A	N/A	
PW-LAH-5A	PW-T-2 Level Hi/Hi-Hi	CR-PNL8	RIS		N/A	N/A	
PW-LAH-5B	PW-T-2 Level Hi/Hi-Hi	ALC-PNL-1			N/A	N/A	

APPENDIX A - TABLE 5
PROCESSED WATER

INSTRUMENT INDEX

Tag No.	Service	Location	Supplier	Model No.	Input/Span Output/Scale	Set Point	Remarks
PW-LI-5	PW-T-2 Level	PW-LCP1	Sigma	1151VB420	4-20 MADC 0-500" WC	N/A	
PW-LSH-5	PW-T-2 Level Hi	PW-LCP1	Foxboro	6JU-BT-GJDR	4-20 MADC N/A	405" WC (I)	
PW-LSHH-5	PW-T-2 Level Hi-Hi	PW-LCP1	Foxboro	6JU-BT-GJDR	4-20 MADC N/A	411" WC (I)	
PW-LT-5	PW-T-2 Level	Local (PWPB)	Foxboro	E13DM-ISAH1	0-500" WC 4-20 MADC	N/A	
PW-TE-6	PW-T-2 Temperature	Local (PWPB)	Rosemount	78N2INO1J5	0-150 F 93.03-125.37Ω	N/A	
PW-TI-6	PW-T-2 Temperature	PW-LCP1	Sigma	1151VB340	4-20 MADC 1-150 F	N/A	
PW-TT-6	PW-T-2 Temperature	Local (PWPB)	Rosemount	442RL2U1A1NA 4-20 MADC	93.03-125.37Ω	N/A	
PW-TW-6	PW-T-2 Temperature	Local (PWPB)	Pyco	16-5018-12"	N/A	N/A	
PW-TSH-7	PW-T-1 Heat Trace Control	Yard (Local)	Chemelex	AMC-1B	40-120 F N/A	42F (I)	
PW-TSL-7	PW-T-1 Heat Trace Control	Yard (Local)	Chemelex	E334-US-277C	40-120 F N/A	37F (D)	
PW-TSH-8	PW-T-2 Heat Trace Control	Yard (Local)	Chemelex	AMC-13	40-120 F N/A	42F (I)	
PW-TSL-8	PW-T-2 Heat Trace Control	Yard (Local)	Chemelex	E334-US-277C	40-120 F N/A	37F (D)	
PW-HIS-9	PW-P-1	PW-LCP1	C-H	E30JF	N/A	N/A	
PW-TAS-9	PW-P-1 Motor Overload	PW-LCP1	RIS	AN3100	N/A	N/A	
PW-HIS-9A	PW-T-2 Local Block	CR-PWL8	C-H	E30DM	N/A	N/A	

APPENDIX A - TABLE 5
PROCESSED WATER

INSTRUMENT INDEX

Tag No.	Service	Location	Supplier	Model No.	Input/Span Output/Scale	Set Point	Remarks
PW-HIS-9B	PW-T-2	CR-PNL8	C-H	E30JF	N/A	N/A	
PW-HIS-10	PW-P-2	PW-LCP1	C-H	E30JF	N/A	N/A	
PW-TAH-10	PW-P-2 Motor Overload	PW-LCP1	RIS	AN3100	N/A	N/A	
PW-HIS-10A	PW-P-2 Local Block	CR-PNL8	C-H	E30DM	N/A	N/A	
PW-HIS-10B	PW-P-2	CR-PNL8	C-H	E30DM	N/A	N/A	
PW-PI-11	PW-P-1 Disch. Press.	Local (PWPH)	Ashcroft	1010A	0-300 psig 0-300 psig	N/A	
PW-PI-12	PW-P-2 Disch. Press.	Local (PWPH)	Ashcroft	1010A	0-300 psig 0-300 psig	N/A	
PW-PI-13	PW-P-3 Disch. Press.	Local (Corridor)	Ashcroft	Field	0-100 psig	N/A	
PW-PI-14	PW-P-4 Disch. Press.	Local (Corridor)	Ashcroft	Field	0-100 psig	N/A	
PW-FI-15	Evaporator Feed Rate	Corridor	Signet	MK-586	0-300 Hz 0-79.5 gpm	N/A	
PW-FQI-15	Evaporator Feed Flow Totalizer	Corridor	Signet	MK-586	0-300 Hz $0\text{-}10^{8}$ gal	N/A	

APPENDIX A - TABLE 6
PROCESSED WATER VALVE LIST

VALVE NO.	SIZE (IN)	DESCRIPTION	TYPE, MANUFACTURER & MODEL NUMBER	MATERIAL SPECIFICATION
PW-V002	2	EPICOR II Effluent	Globe - SW	
PW-V003	3	Tank Cross Connect Inlet Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V004	4	Tank Cross Connect Inlet Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V005	4	Tank T-1 Nozzle Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V006	4	Tank T-2 Nozzle Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V007	2 1/2	Tank Cross Connect Inlet Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V008	2 1/2	Tank Cross Connect Inlet Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V009	3	Tank T-1 Nozzle Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V010	3	Tank T-2 Nozzle Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V011	10	Tank T-1 Nozzle Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V012	10	Tank T-2 Nozzle Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V013	4	Tank T-1 Nozzle Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V014	4	Tank T-2 Nozzle Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V015	6	Tank T-1 Nozzle Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V016	6	Tank T-2 Nozzle Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V017	1	Tank T-1 Level Test Conn. Isol.	Globe-SW-800# DSI #4211	P-426A

APPENDIX A - TABLE 6
PROCESSED WATER VALVE LIST

VALVE NO.	SIZE (IN)	DESCRIPTION	TYPE, MANUFACTURER & MODEL NUMBER	MATERIAL SPECIFICATION
PW-V018	1	Tank T-2 Level Test Conn. Isol.	Globe-SW-800# DSI #4211	P-426A
PW-V019	1	Tank T-1 Level Test Conn. Isol.	Globe-SW-800# DSI #4211	P-426A
PW-V020	1	Tank T-2 Level Test Conn. Isol.	Globe-SW-800# DSI #4211	P-426A
PW-V021	1	Tank T-1 Level Xmit Isol.	Globe-SW-800# DSI #4211	P-426A
PW-V022	1	Tank T-2 Level Xmit Isol.	Globe-SW-800# DSI #4211	P-426A
PW-V035	6	Tank T-2 Nozzle Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V036	6	Tank T-1 Nozzle Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V037	10	Tank T-2 Nozzle Isol.	Gate-BW-300 # Kitz. 300UMAM	P-426A
PW-V038	10	Tank T-1 Nozzle Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V039	2 1/2	SDS Effluent Line Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V040	3/4	EPICOR II Effluent Line Vent	Globe - SW	
PW-V041	6	Tank T-1 Sump Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V042	6	Tank T-2 Sump Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V043	4	Tank T-1 Sump/Suction Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V044	4	Tank T-2 Sump/Suction Isol.	Gate-BW-300 # Kitz 300UMAM	P-426A
PW-V045	1	Pump Suction Process Line Drain	Y-Globe-SW-1500# VSC/Conval #12G2-31655	P-426C

APPENDIX A - TABLE 6
PROCESSED WATER VALVE LIST

VALVE NO.	SIZE (IN)	DESCRIPTION	TYPE, MANUFACTURER & MODEL NUMBER	MATERIAL SPECIFICATION
PW-V046	6	Pump Suction Cross Conn. Isol.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V047	6	Common Flanged Suction	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V048	3/4	Pump Suction Line Vent	Globe-SW-800# McJunkin Vogt #SW-12501	P-426C
PW-V049	6	Pump Suction Cross Conn. Isol.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V050	4	PW-P-1 Suction Isol.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V051	6	PW-P-2 Suction Isol.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V052	3/4	PW-P-1 Px Isol.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V053	3/4	PW-P-2 Px Isol.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V054	3/4	PW-PI-11 Px Isol.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V055	3/4	PW-PI-12 Px Isol.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V056	3	PW-P-1 Discharge	Check-BW-150# McJunkin/Aloyco #377	P-426C
PW-V057	4	PW-P-2 Discharge	Check-BW-150# McJunkin/Aloyco #377	P-426C
PW-V058	3	PW-P-1 Discharge	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V059	4	PW-P-2 Discharge	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V060	3	PW-P-1 Discharge Isol.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V061	4	PW-P-2 Discharge Isol.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C

APPENDIX A – TABLE 6
PROCESSED WATER VALVE LIST

VALVE NO.	SIZE (IN)	DESCRIPTION	TYPE, MANUFACTURER & MODEL NUMBER	MATERIAL SPECIFICATION
PW-V062	3	Pump Discharge Crossover Isol.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V063	3/4	Pump Suction Line Vent	Globe-SW-800# McJunkin/Vogt #SW-12501	P-426C
PW-V065	3/4	Sample Isol.	Diaphram-SW-150# MON/ITT #2470-3-M	P-426C
PW-V066	1 1/2	PW-P-1 Min. Flow Bypass Isol.	Diaphram-SW-150# MON/ITT #2470-3-M	P-426C
PW-V067	4	PW-P-2 Min. Flow Bypass Isol.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V068	3	Pump Discharge Spare	Diaphram-SW-150# MON/ITT #2465-3-M	P-426C
PW-V069	3	Pene. R-565 Outboard Isol.	Globe-BW-150# Aloyco N316 Special	44230
PW-V076	4	PW-P-2 Recirc. Isol.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V077	4	Min. Flow Recirc. Crossover Isol.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V078	3/4	EPICOR II Effluent Line Vent	Globe-SW-800# DSI #4211	P-426A
PW-V079	3	PW-T-1 Inlet	Check-BW-150# McJunkin/Aloyco #377	P-426C
PW-V080	3	PW-T-2 Inlet	Check-BW-150# MON/ITT #2470-3-M	P-426C
PW-V081	1 1/2	Sample Sink Drain Isol.	Diaphram-SW-150# MON/ITT #2465-3-M	P-426C
PW-V082	3	Pump Suction Flanged Conn.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V083	4	PW-P-2 Min. Flow Recirc.	Check-BW-150# McJunkin/Aloyco #378	P-426C
PW-V084	1 1/2	PW-P-1 Min. Flow Recirc.	Check-BW-SW-150# McJunkin/Aloyco #374	P-426C
PW-V086	3/4	Sample Line Isol.	Diaphram-SW-150# MON/ITT #2470-3-M	P-426C

APPENDIX A - TABLE 6
PROCESSED WATER VALVE LIST

VALVE NO.	SIZE (IN)	DESCRIPTION	TYPE, MANUFACTURER & MODEL NUMBER	MATERIAL SPECIFICATION
PW-V087	3/4	Common Pump Discharge Vent	Globe-SW-800# McJunkin/Vogt #SW-12501	P-426C
PW-V088	1	Common Pump Discharge Drain	Y-Globe-SW-1500# VSC/Conval #12G2-31655	P-426C
PW-V090	1	PW-P-1 Casing Drain	Globe-SW-1000# Dresser/Mancock #5500W1XMY9	
PW-V091	1	PW-P-2 Casing Drain	Globe-SW-1000# Dresser/Mancock #5500W1XMY9	
PW-V093	1	Pump Min. Flow Recirc Cross Drain	Y-Globe-SW-1500# VSC/Conval #12G2-31655	P-426C
PW-V098	2 1/2	Penc. R-565 Outboard Isol.	Globe-BW-150# Aloyco N316 Special	44230
PW-V099	1	Penc. R-565 Test Conn. Isol.	Globe-SW-600# Dresser/Mancock 5500W	94711
PW-V100	4	Supply to R-565 Isol.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V101	1	Supply to R-565 Line Drain	Y-Globe-SW-1500# VSC/Conval #12G2-31655	P-426C
PW-V102	1	OTSG Line Drain	Y-Globe-SW-1500# VSC/Conval #12G2-31655	P-426C
PW-V103	1	Penc. R-565 Test Conn. Isol.	Globe-SW-600# Dresser/Mancock #5500W	94711
PW-V104	3	Common Pump Discharge Flanged Conn.	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V105	3	Supply to R-565 Spare	Diaphram-BW-150# MON/ITT #2465-3-M	P-426C
PW-V106	3/4	OTSG Line Vent	Globe-SW-800# McJunkin/Vogt #SW-12501	P-426C
PW-V107	2 1/2	SDS to PW-T's	Gate-BW- Ladish #8276-0107-25A	Field
PW-V108	2 1/2	Supply to PW-T's	Gate-BW- Ladish #8276-0107-25A	Field

APPENDIX A – TABLE 6
PROCESSED WATER VALVE LIST

VALVE NO.	SIZE (IN)	DESCRIPTION	TYPE, MANUFACTURER & MODEL NUMBER	MATERIAL SPECIFICATION
PW-V109	3/8	Sample Throttle	Needle-tube- Parker CFI #6Z-V4LN-55	Field
PW-V110	3/4	PW-P-3 Discharge Check	Piston Check, Rockwell-Edward, Fig. 36174	A-182
PW-V111	1/4	PW-PI-13 Gauge Isolation	Globe, Parker, #4Z-V4LR-SS	A-182
PW-V112	3/4	PW-P-3 Suction Isolation	Ball, Velan, #W-G0613-SSX	A-351
PW-V113	3/4	PW-P-4 Suction Isolation	Ball, Watts, #S8501	A-351
PW-V114	3/4	PW-P-4 Bypass	Ball, Jamesbury, #4C-3600TT-1	A-351
PW-V115	3/4	PW-P-4 Discharge Check	Piston Check, Rockwell-Edward, Fig. 36174	A-182
PW-V116	1/4	PW-PI-14 Gauge Isolation	Globe, Parker, #4Z-V4LR-SS	A-182
PW-V117	3/4	PW-P-4 Discharge Throttle	Globe, Vogt, #E-44244R18	A-182
PW-V118	3/4	PW-P-4 Discharge to Evaporator	Ball, Watts, #S8501	A-351
PW-V119	3/4	PW-P-3 Discharge Throttle	Globe, Vogt, #E-44244R18	A-182
PW-V120	3/4	PW-P-4 Discharge Vent	Ball, Jamesbury, #4C-3600TT-1	A-351
PW-V121	3/4	PW-P-3 Discharge Vent	Ball, Watts, #S8501	A-351
PW-V122A	3/4	DH-P2A Discharge to PWDS		Field
PW-V122B	3/4	DH-P2B Discharge to PWDS		Field
PW-V123	1/2	PW-P-4 Suction Vent		Field
PW-V124	3/4	BWST Supply to PW-P4 Suction		Field
PW-V125	3/4	BWST Supply to PW-P4 High Point Vent		Field