

Facility: IPC INDIAN POINT ENERGY CENTE Unit: 1
Tsk Pri : 4A Task Dspln: DRYF
Planner : FUCITO D

W/O Title : MODIFICATIONS TO FHB WEST
POOL DEMINERALIZER SYST (EC-3008)
W/O Task Title: DRAIN DOWN OF UNIT 1 SPENT
FUEL POOL COMPLEX



00123484 10

W/O Type: WO
Job Type: OT
Pkg Type: C
Printed : 09/18/2008
11:57



Page: 1

Work Order Task Written To

Sys : BLDG Ops Review Req'd : N
Division : House Keeping :
Equipment : BLDG FSB Crew Size : 4
Equip. Tag: IP1-FSHB Duration : 160.00
Alt :
Component :
Equip Name: UNIT 1 FUEL HANDLING BUILDING

CR Com Rqd: 3 NOTIFY WORK CONTROL CENTER IN PERSON PRIOR TO START OF WORK

Location : FSB
BLDG FSB ELEV ROOM COL LINE AZ DEG

Acct No. : GL IP2 Activity: CRSS Project:
Cost Centr: NEV32 User Def: F3PC5MTCSB

Equipment Information

Maintenance Rel. : Q Group :
Safety Class : REQ EQ : N
Seismic :
Critical Equip :
Manufacturer :
Model Number :
Serial Number :

Rework/Approval

ReWork Job : N Comments:

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Page: 3

Completion Comments on Work Performed

Completion Comments Required : Y

Comments: _____

Comments: _____

Comments: _____

Continued on Additional Sheets? : _____

Work Completion Signatures

Name	Badge No	Date
_____	_____	_____
_____	_____	_____
_____	_____	_____

Comments: _____
(rework?) _____

Facility: IPC INDIAN POINT ENERGY CENTER
Unit : 1 Project :
W/O Type: WO Priority: 4A W/O Dspln: MECH
Planner : DFUCI90 FUCITO D
W/O Title : MODIFICATIONS TO FHB WEST POOL DEMIN
W/O Task Title: DRAIN DOWN OF UNIT 1 SPENT FUEL POOL
Written To : UNIT 1 FUEL HANDLING BUILDING
Task Dspln : DRYF Completed By:



Work Order Package

00123484 10

Rpt : TIPMC1A
Date: 09/18/2008



Page: 1

Work Order Task Written To

Facility : IPC	Unit : 1	Op Sys :
Division :	Area :	Sys/Cls: BLDG
Equipment : BLDG FSB	Component:	
Work Item :	Eqt. List:	Ops Review Reqd: N
Equip. Tag: IP1-FSHB	Alt:	
UTC :	Tbl/Brkdwn: (Past 12 mo)	
Catalog ID:	Job Type : OT	UCR:
Client/Act:		
Location : FSB 50010001	BLDG FSB ELEV	ROOM COL L
Cost Centr: NEV32	Activity : CRSS	User Def: F3PC5MTCSE
Percentage: 100.000	Acct No. : GL IP2	

References/Document Information

Type/Subtyp: NONQ	Number: FLOW DIAGRAM	Sheet:
Title/Desc : MODIFIED SYSTEM FLOW DIAGRAM		Image: N
Type/Subtyp: NONQ	Number: HARDWARE SKETCHES	Sheet:
Title/Desc : HARDWARE SKETCHES		Image: N

EN-WM-105		Indian point Unit 2	
Work Order-Task # / Package Type		00123484-10	Compliance Package
Work Item / Equipment		NUMBER	
Discipline		MECHANICAL	Revision 2/3/2007

1. PURPOSE AND SCOPE

- 1.1. The purpose of this work order task is to process and drain the water from the West Storage Pool and adjacent pools. The work is divided into two types:
- 1.1.1. Modifications to the 24/7 skid to enhance its clean-up and sampling capability, and to tie the discharge of the skid into the distillate tank discharge path.
 - 1.1.2. Processing and discharging the water in accordance with procedure 1-RP-RWM-913.
- Details of the modifications are illustrated in the attached sketches. Details related to processing are included in the attached revision to 1-RP-RWM-913, with additional requirements specified in Sections 4.2 through 4.5 below.

2. PRECAUTIONS AND LIMITATIONS

2.1. NOTES:

- 2.1.1. Modifications to the 24/7 skid will be pre-fabricated to the extent possible. Work order steps associated with pre-fabrication are explicitly identified in Section 4.1 below.
- 2.1.2. Approximately 500,000 gallons of water will be processed under this work order task.
- 2.1.3. The North Curtain Drain (NCD) and Sphere Foundation Drain (SFD) pumps use the same discharge path that will be used for this evolution and will remain active during the discharge.

2.2. PRECAUTIONS:

- 2.2.1. Notify RP prior to breaching any radioactive systems.
- 2.2.2. Refer to procedure 1-RP-RWM-913 for additional precautions related to the operation of the 24/7 skid.

2.3. LIMITATIONS:

- 2.3.1. Discharge shall not be performed until after all fuel has been removed from the West Pool.
- 2.3.2. The submersible pump installed in the West Pool must be suspended approximately 3'-0" above the floor to prevent any accumulated sediment from entering the flow stream.
- 2.3.3. Maximum permissible flow rate for discharge is 45 gpm. **THIS FLOW RATE SHALL NOT BE EXCEEDED DURING THE DISCHARGE.**
- 2.3.4. Refer to procedure 1-RP-RWM-913 for additional limitations related to operation of the 24/7 skid.

EN-WM-105	Indian point Unit 2	
Work Order-Task # / Package Type	00123484-10	Compliance Package
Work Item / Equipment	NUMBER	
Discipline	MECHANICAL	Revision 2/3/2007

Note: The Following Work Instructions can be worked out-of-sequence OR omitted at the discretion of the Cognizant Supervisor, as long as the work scope is fully met.

4. WORK PLAN DETAILS

4.1. PRE-FABRICATION

- 4.1.1. Suspend submersible pump and hose in West Pool as illustrated in Sketch 'A'. Ensure that pump is approximately 3'-0" above the bottom of the pool. DO NOT ATTACH PUMP DISCHARGE TO 24/7 SKID, AND DO NOT ENERGIZE PUMP.

Engineering Representative/Date

- 4.1.2. Stage shielded filter and associated hoses inside the 24/7 berm as illustrated in Sketch 'B'. DO NOT ATTACH HOSES TO 24/7 SKID.
- 4.1.3. Fabricate and stage Composite Sampler No.s 1 and 2 as illustrated in Sketch 'C'.
- 4.1.4. Construct and stage post-filter system in the vicinity of the 24/7 skid, as illustrated in ABS Drawing 1792949-D-001 Sheets 2 and 3.

4.2. TIE-IN

- 4.2.1. Notify qualified personnel to shut down the 24/7 skid and close valve VLV-010 in accordance with procedure 1-RP-RWM-913.
- 4.2.2. Notify qualified personnel to electrically isolate pump and control power to the demineralizer skid. The skid is isolated by unplugging the 440 V and 120 V power cords from the nearby Duraline. Ensure cords are appropriately marked to prevent them from being inadvertently plugged in.
- 4.2.3. Notify RP that 24/7 skid piping will be breached.
- 4.2.4. Remove 6" guard pipe and interior braided hose as directed by the field supervisor.
- 4.2.5. Tie in downstream portion of system to VLV-010 as illustrated on ABS Drawing 1792949-D-001 Sheet 2.
- 4.2.6. Attach submersible pump discharge hose to 24/7 skid piping as shown in Sketch 'A'. DO NOT ENERGIZE PUMP.
- 4.2.7. Attach shielded filter hoses to 24/7 skid piping as shown in Sketch 'B'.
- 4.2.8. Tie in post-filter train to VLV-031 and VLV-032 as illustrated on ABS Drawing 1792949-D-001 Sheet 3.

<i>EN-WM-105</i>		<i>Indian point Unit 2</i>
<i>Work Order-Task # / Package Type</i>	<i>00123484-10</i>	<i>Compliance Package</i>
<i>Work Item / Equipment</i>	<i>NUMBER</i>	
<i>Discipline</i>	<i>MECHANICAL</i>	<i>Revision 2/3/2007</i>

5. RESTORATION

- 5.1.** Notify OPS to perform the following steps:
 - 5.1.1. Close and tag LW-700.
 - 5.1.2. Close and tag LW-703.
 - 5.1.3. Close and tag LW-708.
 - 5.1.4. Close and tag VLV-049.
- 5.2.** Notify qualified personnel to shut down the 24/7 skid and close valve VLV-010 in accordance with procedure 1-RP-RWM-913.
- 5.3.** Notify qualified personnel to electrically isolate pump and control power to the demineralizer skid. The skid is isolated by unplugging the 440 V and 120 V power cords from the nearby Duraline. Ensure cords are marked to prevent them from being inadvertently plugged in.
- 5.4.** Notify RP that 24/7 skid piping and LW-702 will be breached.
- 5.5.** Carefully remove LW-702 adapter and re-install valve internals and valve bonnet.
- 5.6.** Notify OPS to perform the following steps:
 - 5.6.1. Clear tag on LW-700.
 - 5.6.2. Clear tag on LW-703.
 - 5.6.3. Clear tag on LW-441
 - 5.6.4. Clear tag on LW-442.
 - 5.6.5. Clear tag on LW-523.
 - 5.6.6. Clear tag on LW-959.
 - 5.6.7. Clear tag on LW-431.
 - 5.6.8. Clear tag on LW-858.
 - 5.6.9. Clear tag on LW-708.
- 5.7.** Monitor valve LW-702 for leakage during the next scheduled discharge from the distillate tanks.

New Procedure/Revision/Cancellation Summary

1.0 REASON FOR REVISION

1.1 Reconfigure system for post-fuel drain-down (EC 7981).

2.0 SUMMARY OF CHANGES

2.1 Complete rewrite of procedure.

1.0 PURPOSE

- 1.1 This procedure provides instructions for the setup, operation, media sluicing, filter changes and minor maintenance of the demineralizer system used for clean-up of the IPEC Unit 1 West Spent Fuel Pool water (referred to as the 24/7 Skid). After processing, water may be recirculated back to the pool or may be directed to the discharge system.
- 1.2 This procedure also provides response guidance to the 24/7 skid alarms.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 PRECAUTIONS

- 2.1.1 Notify the Unit 2 Control Room and Radiation Protection prior to system start-up, media sluicing **AND** shutdown.
- 2.1.2 Update the Unit 2 Control Room of status changes to the 24/7 skid.
- 2.1.3 Processing of Spent Fuel Pit (SFP) water may result in elevated dose rates at vessel shield OSSC (On-Site Storage Container) and the 24/7 skid.
- 2.1.4 Only Nuclear Service Grade (NSG) water **OR** other deionized (DI) water may be used for servicing the system.
- 2.1.5 NSG and station air **SHALL** be protected by check valves to prevent backflow of radioactive contaminants into clean systems.
- 2.1.6 All Camlock®-type connections **SHALL** be pinned, tie-wrapped **OR** taped to prevent inadvertent opening.
- 2.1.7 Dams or a "berm" **SHALL** be installed around the 24/7 skid, pumps **AND** filters to prevent contaminated water from exiting the radioactive controlled area (RCA).
- 2.1.8 **WHEN** hoses are connected to skid, pressurized **AND** NOT contained, **THEN** the system **SHALL** be continually monitored by qualified personnel.
 - Camera and remote monitor can be used for this.
 - Personnel **SHALL** be available to respond to hose failure.
- 2.1.9 Depressurize hoses prior to disconnecting:
 - Face shield required.
 - Hoses and 24/7 skid lines are internally contaminated.
- 2.1.10 Leak test hoses after reconnection to 24/7 skid or vessel.
- 2.1.11 Leak test 24/7 skid whenever a connection **OR** pressure point is broken.
- 2.1.12 All status changes and maintenance to include leak tests are to be recorded in Liquid Waste Process Systems (LWPS) Technician Log.

2.2.7 Notify RP whenever large rate dose display indicates:

- ≥ 1 Rem/hour
- ≥ 10 Rem/hour
- ≥ 20 Rem/hour (media should be changed out)

2.2.8 Pressure vessel media maximum specific activity limits are as follows:

- 350 uCi/cc NON-gaseous fission products
- 206 uCi/cc gaseous fission products

2.2.9 **IF** pre-filter is used, **THEN** consider using shielding.

2.2.9.1 Limit external dose to ≤ 75 mR/hr.

2.2.10 **IF** post-filter is used, **THEN** change out filters when dose rate on housing ≤ 75 mR/hr.

2.2.11 Pre- and post-filter delta-P limit is 30 psid.

2.2.12 Pressure vessel delta-P limit is 40 psid.

2.2.13 Water processing **AND** pressure vessel sluicing in/out SHALL NOT be done simultaneously.

2.2.14 General area dose rates around the OSSC **AND** 24/7 skid should be limited to < 100 mR/hr contact.

2.2.15 **IF** any spent fuel remains in the pool, **THEN** utilize Foreign Material Exclusion (FME) barriers and tools when working within the SFP boundary.

2.2.16 Chemistry to monitor Unit 1 West Pool to ensure activity does not exceed $5.00E^{-2}$ uCi/ml.

2.2.17 Pressure vessel media should be changed out (sluiced) whenever the media decontamination factor (DF) is less than 10.

2.2.18 Water level must be high enough above irradiated fuel to maintain (fuel related) dose rates on the operating deck ≤ 15 mR/h.

2.2.19 In any pool which contains irradiated fuel, **IF** water level be below elevation 48 foot **THEN** Radiation Protection is required to verify Operating Deck radiation levels daily.

4.2.6 Fill and vent the post-filter train by performing the following steps:

- 4.2.6.1 OPEN VLV-040
- 4.2.6.2 OPEN VLV-032
- 4.2.6.3 Cycle OPEN/CLOSE VLV-042 to vent PV-1
- 4.2.6.4 Cycle OPEN/CLOSE VLV-043 to vent PV-2
- 4.2.6.5 Cycle OPEN/CLOSE VLV-044 to vent PV-3
- 4.2.6.6 Cycle OPEN/CLOSE VLV-045 to cycle PV-4
- 4.2.6.7 OPEN VLV-046 **AND** vent Composite Sampler No. 1
- 4.2.6.8 OPEN VLV-041
- 4.2.6.9 OPEN VLV-047 **AND** vent Composite Sampler No. 2.

4.2.7 Fill and vent the skid outlet header by performing the following steps:

- 4.2.7.1 OPEN VLV-008
- 4.2.7.2 OPEN VLV-009
- 4.2.7.3 OPEN VLV-049
- 4.2.7.4 Cycle OPEN/CLOSE VLV-052 to vent to West Pool
- 4.2.7.5 OPEN VLV-051
- 4.2.7.6 Cycle OPEN/CLOSE VLV-054 to vent to floor drain.

4.3 **LEAK TESTS**

4.3.1 CONNECT NSG to priming water connections at VLV-021.

4.3.2 OPEN VLV-023.

CAUTION

Exceeding 30 psig on 30/30 pressure gauges will damage the gauge and may cause leakage.

4.3.3 Use NSG supply water valve **OR** 24/7 skid priming water valve VLV-020 to control pressurizing skid.

4.3.4 **WHEN** pressure on 30/30 gauges read 25 psig, **THEN** CLOSE gauge isolation valves VLV-036, VLV-037 **AND** VLV-038.

4.3.5 Raise pressure to minimum 75 psig to maximum 90 psig as indicated on P03 **OR** P07 **AND** hold for a minimum of 5 minutes.

4.3.5.1 **IF** leaks are noted, **THEN** depressurize by opening VLV-052.

NOTE

Normal flow is through Vortex flow meter FM-AV **AND** ultrasonic flow meter FM-B. **IF** FM-A is out of service, **THEN** it can be by-passed and flow monitored on FM-B. Throttling FM-A isolation valves VLV-007 OR VLV-008 will cause an erroneous reading on FM-A.

4.4.4 **IF** desired to by-pass Vortex flow meter FM-A, **THEN** CLOSE VLV-007 **AND** OPEN VLV-009.

4.4.5 **IF** desired to send flow through Vortex flow meter FM-A, **THEN** OPEN VLV-008.

NOTE

Operator will control AOD submersible pump **AND/OR** NSG water to provide desired priming of system by monitoring pressure on P01, P02 **OR** P03 **AND** flow on ultrasonic flow meter FM-B.

CAUTION

DO NOT exceed + 30 psig on PO1 or PO2 pressure indicators.

4.4.6 OPEN VLV-052 to align system in recirculation mode.

4.4.7 **IF** priming is needed, **THEN** perform the following:

4.4.7.1 **IF** using AOD pump to prime system, **THEN** start AOD pump by controlling air pressure to AOD pump.

4.4.7.2 **IF** using submersible pump, **THEN** energize pump.

4.4.7.3 **IF** using NSG water to prime system, **THEN** pressurize NSG water hose **AND** throttle OPEN VLV-020.

4.4.7.3.1 **WHEN** NSG water priming is completed, **THEN** CLOSE VLV-020.

NOTE

Operator must adjust VLV-005 **AND** VLV-010 to balance pressure and flow through system.

4.4.12 **IF** the 24/7 skid main pump will be used to provide flow to system, **THEN** perform the following:

4.4.12.1 Press main pump RESET button on main power panel.

4.4.12.2 Place main pump control switch to "HAND" position.

- Adjust VLV-005 to maintain back-pressure of 20 psig to 50 psig on pump as indicated on P03.
- Adjust VLV-010 to maintain 2 psig to 20 psig as indicated on P07 **AND** flow \leq 45 gpm.
- Adjust VLV-003 **OR** VLV-023 to maintain skid pump outlet pressure \leq 100 psig.
- Monitor flow on FM-A **OR** FM-B.

4.4.12.3 **IF** pump trips off during start-up, **THEN** operator may press RESET button up to three times to restart.

- **IF** main pump will not remain on-line, **THEN** place the pump switch to "OFF" and contact supervision.

4.4.13 **WHEN** 24/7 skid system is running, **THEN** inform Unit 2 Control Room **AND** Watch RP technician.

4.4.14 Record pressures and flow rates in West Pool logbook.

4.4.15 Complete remainder of task sign-offs in "Task Sign-Off Sheet" of Attachment 9.3.

4.4.16 Notify Chemistry to take required samples.

NOTE

The following steps initiate discharge of the U1 Spent Fuel Complex through the liquid waste discharge path.

4.4.17 Verify Chemistry sample results are satisfactory.

4.4.18 Verify Chemistry/Operations have prepared Daily Discharge Permit and any other paperwork required for discharge.

4.4.19 Verify 24/7 system has recirculated a minimum of 10,000 gallons.

4.4.20 Record FM-D totalizer initial reading. (NOTE: Totalizer will reset to zero after 999,999 gallons. Therefore, ensure that sufficient margin exists on initial reading to account for anticipated addition of 500,000 gallons.)

4.4.21 Notify Operations that discharge is about to commence.

4.6 SAMPLING

NOTE

Periodically sample the vessel inlet AND outlet to determine the effectiveness of the resin.

- 4.6.1 System inlet is sampled at VLV-026.
- 4.6.2 24/7 Skid System Effluent (outlet) is sampled at VLV-033.
- 4.6.3 The composite samplers located at the inlet and outlet of the E.S. system are sampled locally.
- 4.6.4 Record sample results in logbook.

4.7 VESSEL MEDIA ADDITION

NOTE

RP and Chemistry supervision will collaborate on type and amount of media (resin) to be loaded into vessel.

CAUTION

To allow for proper bed expansion, DO NOT load more than 30 cubic feet of total media into vessel.

- 4.7.1 IF old media has not yet been sluiced out, THEN sluice-out prior to continuing.
- 4.7.2 Request new media for vessel.
- 4.7.3 Set up media additional AOD pump.
 - 4.7.3.1 CONNECT suction spool and hose to suction side of pump.
 - 4.7.3.2 CONNECT pump discharge hose to ext. sluice valve.
- 4.7.4 CONNECT hose to VLV-027 AND route other end to West Pool OR suitable other drain.
- 4.7.5 CLOSE VLV-004 AND VLV-030.
- 4.7.6 OPEN VLV-005 AND VLV-027.
- 4.7.7 OPEN vessel "SLUICE IN" (in OSSC) AND "EXT. SLUICE IN" valves.
- 4.7.8 Set-up NSG water supply to fill drums of resin.

- 4.8.4 Complete Base Valve Alignment, Attachment 9.1.
- 4.8.5 CLOSE VLV-003.
- 4.8.6 Fully OPEN VLV-005.
- 4.8.7 CONNECT sluice-out hose flush spool to "EXT. SLUICE OUT" connection.

NOTE

The LWPS operator will identify the proper resin transfer sluice-in connection to be used.

- 4.8.8 CONNECT sluice hoses from flush spool to resin transfer equipment sluice in connection.

CAUTION

Check valve SHALL be used to prevent back-flow of resin into NSG water supply **OR** station air from sluice hose when inter-connected.

- 4.8.9 CONNECT NSG water supply to 24/7 Skid VLV-025 **AND** to sluice hose flush spool.
- 4.8.10 **IF** not previously completed, **THEN** conduct a resin pre-transfer pre-job brief.
 - 4.8.10.1 Notify Unit 2 Control Room prior to sluice-out.
 - 4.8.10.2 RP to limit access to 70' Fuel Handling floor **AND** monitor dose rate at roll-up door across from Security command post.
 - 4.8.10.3 West Pool demin vessel sluice-out to be limited to low traffic periods at Security command post.
 - 4.8.10.4 DO NOT sluice while Operations is releasing a Waste Distillate Storage tank.
 - 4.8.10.5 RP may need to relocate barrier **AND/OR** lead blankets in order to allow access to reach rod.
 - 4.8.10.6 OSSC lid may also have to be removed.
- 4.8.11 Request LWPS operator to energize resin transfer **AND** dewater equipment.
- 4.8.12 Request LWPS operator to open valves of resin transfer equipment to allow for sluice of resin into High Integrity Container (HIC).
- 4.8.13 Leak test sluice-out hose for 5 minutes by sending NSG water through flush spool connection to HIC.
 - 4.8.13.1 **WHEN** water noted going into HIC, CLOSE AOV-WS-1.
 - 4.8.13.2 CLOSE NSG water supply to flush spool at 75 psig.
- 4.8.14 Using ladder **AND** reach rod, OPEN vessel sluice-out valve located inside OSSC.

- 4.9.4.1 CONNECT dewater pump suction hose to pre-filter drain.
- 4.9.4.2 Route pump discharge hose to West Pool or other suitable drain.
- 4.9.4.3 OPEN filter drain.
- 4.9.4.4 OPEN filter vent.

NOTE

Operator may start and stop dewater pump as needed during filter change.

- 4.9.4.5 START dewater pump.
- 4.9.5 Remove pre-filter housing lid.
- 4.9.6 Remove old filter(s) **AND** dispose of per RP supervision.
- 4.9.7 Install new filter(s).
 - Filter type and size per RP supervision.
- 4.9.8 Install filter housing lid.
 - Lubricate O-ring **OR** gasket.
 - Tighten lid snugly, but do not crush gasket or O-ring.
- 4.9.9 CLOSE filter drain.

NOTE

Operator may start and stop dewater pump as needed during filter change.

- 4.9.10 Slowly OPEN filter inlet VLV-029 to fill **AND** vent housing.
 - 4.9.10.1 **WHEN** a steady stream of water is coming from vent, **THEN** CLOSE vent valve **AND** check housing for leaks.
 - 4.9.10.2 **IF** leaks are noted, **THEN** CLOSE VLV-029 **AND** RE-OPEN drain.
- 4.9.11 **IF** NO leaks are noted, **AND** the filter is to be returned to service, **THEN** perform the following:
 - OPEN VLV-029
 - OPEN VLV-030
 - CLOSE VLV-004
- 4.9.12 **IF** filter will remain out-of-service, **THEN** CLOSE VLV-029.
- 4.9.13 **IF** NSG water was used, **THEN** CLOSE VLV-024 **AND** disconnect water supply hose.
- 4.9.14 DISCONNECT dewater pump and return to storage.

4.10.10.2 WHEN steady stream of water is coming from filter vent, THEN CLOSE vent AND check for leaks.

4.10.10.3 IF leaks are noted, THEN CLOSE filter inlet VLV-031 AND RE-OPEN filter drain.

4.10.11 IF NO leaks are noted, AND filter is to be returned to service, THEN perform the following:

- OPEN filter inlet VLV-031
- OPEN filter outlet VLV-032
- CLOSE filter bypass VLV-006

4.10.12 IF filter will remain out of service, THEN CLOSE filter inlet VLV-031.

4.10.13 IF NSG water was used, THEN CLOSE priming valve VLV-024 AND DISCONNECT NSG water hose.

4.10.14 DISCONNECT dewater pump hoses AND return to storage.

4.11 ALARM RESPONSE

An audible and visual alarm is mounted on the 24/7 Skid to indicate several inches of water in berm. There is no reset button for this alarm.

4.11.1 IF the 24/7 skid alarm activates, THEN place pump control switch to "OFF" position.

4.11.1.1 IF unable to access pump control switch, THEN switch OFF main circuit power at Duraline.

4.11.1.2 IF AOD priming pump is running, THEN secure air to pump.

4.11.1.3 IF NSG water supply to skid is in use, THEN secure NSG water supply valve.

4.11.2 Notify Unit 2 Control Room AND Watch RP technician of 24/7 Skid alarm and status.

4.11.3 Switch OFF power circuit #3 to alarm panel from Duraline OR unplug power cord to silence the alarm.

4.11.4 Switch OFF main power circuit #15 at Duraline to de-power 24/7 Skid pump circuit.

4.11.5 Use dewater pump to remove water from berm area.

4.11.6 CLOSE all valves on 24/7 Skid.

4.11.7 Trouble-shoot system to identify cause of water in berm.

4.11.8 System must be leak-tested prior to restart.

4.12 TROUBLE-SHOOTING

4.12.1 Main pump fails to start:

4.12.5 Main pump out-of-service:

- Use AOD priming pump as feed pump. See start-up procedure.

4.12.6 Main pump trips off-line:

- Main pump will trip off-line due to pump run-out or pump is dead-headed.
- Excessive pump cavitation can cause pump run-out or over-heating.
- Adjust pump outlet valve VLV-005 **AND** reset pump.
- Best run profile is for P03 to indicate between 30 to 40 psig.

4.12.7 No flow indicated on Vortex FM-A:

- Check VLV-007 **AND** VLV-008 fully OPEN.
- Check for flow indication on FM-B.
- Debris in Vortex flow meter will cause no flow.
- Throttling VLV-007 **OR** VLV-008 will cause abnormally high reading.
- FM-A can be bypassed by OPENING VLV-009 **AND** CLOSING VLV-007 **AND** VLV-008.

4.12.8 No flow indicated Ultrasonic FM-B:

- Check for loose cables.
- There are no adjustments to this flow meter.

4.12.9 No flow from Effluent Sample Point:

- Must have a positive pressure indicated on P07.
- Either increase flow by OPENING VLV-005 a little more **OR** by throttling CLOSE VLV-010 a little more.

4.13 MAINTENANCE

Operator maintenance consists of troubleshooting system, sampling, leak tests, filter and resin change-out replacement of pressure gauges, ball valve maintenance **AND** hose replacement.

4.13.1 To tighten a ball valve gland nut, remove handle.

- Ensure valve will still operate after tightening gland nut **AND** reinstall handle.

4.13.2 To replace a pressure gauge, CLOSE its isolation valve.

- **IF** gauge does not have an isolation valve, **THEN** SHUT DOWN system **AND** CLOSE valve upstream **AND** downstream of gauge.

5.0 DEFINITIONS / DISCUSSION

5.1 DEFINITIONS

- 5.1.1 **24/7 Skid** – Pump skid developed by ABS Consulting for processing Unit 1 West SFP 24-hours per day, 7 days a week.
- 5.1.2 **Emotron M20** – 24/7 Skid pump power control unit.
- 5.1.3 **Berm** – Metal containment area for leaks in which the 24/7 Skid and OSSC sit.
- 5.1.4 **Vessel** – 50 cu.ft. pressure vessel (demineralizer).
- 5.1.5 **VLV** – Valve.
- 5.1.6 **AOD** – Air Operated Diaphragm pump. This is a positive displacement-type pump.
- 5.1.7 **NSG** – Nuclear Service Grade water (deionized).
- 5.1.8 **HIC** – High Integrity Container, usually poly.
- 5.1.9 **Service Water** – NSG water.
- 5.1.10 **FM** – Flow meter.
- 5.1.11 **Sparge** – Internal line inside vessel used for distributing water below top of resin.
- 5.1.12 **Influent** – Inlet water stream to vessel.
- 5.1.13 **Effluent** – Outlet water stream from vessel.
- 5.1.14 **Internal** – Generally refers to items or valve located inside the OSSC.
- 5.1.15 **Ext. or External** – Generally refers to items or valves located outside of OSSC.
- 5.1.16 **Housing** – Refers to filter housing and may contain bag or cartridge-type filters.
- 5.1.17 **“P”** – Pressure.
- 5.1.18 **Delta Pressure (ΔP)** – The difference between inlet and outlet pressure.
- 5.1.19 **Header** – Pipe with series of valves.
- 5.1.20 **LWPS** – Liquid Waste Process Systems.
- 5.1.21 **Operator** – Personnel qualified to operate portable demineralizer systems or liquid waste process systems at IPEC.

The metal berm is 10' by 15'. The 24/7 Skid and OSSC sit inside the berm. A pass-through pipe is bolted to the berm. Pipes from the 24/7 Skid pass through this between the berm and the West Storage Pool. It also allows for water spilled in the berm to go back to the pool. When water in the berm is about 5", the alarm light will flash.

Hard pipes for vessel inlet and outlet run from the 24/7 Skid up into the OSSC. Just inside the OSSC, the vessel inlet and outlet hoses connect (using Camlocks) to these pipes.

The demineralizer vessel is located in the OSSC. There are four connections on the vessel for hoses: inlet, outlet, media (resin) sluice-in and media (resin) sluice-out. The inlet line of the vessel also has a sparge valve which can be used in place of the inlet valve. The inlet or sparge valve and outlet valve are always open. A sample valve located on the vessel header is always closed and not used. The vessel header sluice-in valve (top of vessel) and the sluice-out valve (bottom of vessel) are always closed during normal 24/7 Skid operation. The sluice-out valve has a reach rod installed with ratchet at the top for opening the valve during sluicing. Both vessel sluice valves have hoses connected to them which run out to the outside of the OSSC. There are additional isolation valves on the end of these hoses.

The OSSC contains the hoses and vessel to prevent spraying of water during a leak. The OSSC will hold approximately 1,000 gallons before spilling over into the berm. The OSSC lid is set on blocks to allow for the pipes and hoses to pass through. There is also a portable shield ring which sets on the lid and allows for hanging lead blankets.

6.0 ACCEPTANCE CRITERIA

- 6.1 West Pool demineralizer decontamination factor (DF) is equal to or greater than 10.
- 6.2 West Pool water activity is equal to or less than 1.00E^{-2} uCi/ml.

7.0 REFERENCES

7.1 COMMITMENT DOCUMENTS

- 7.1.1 SE No. 96-118PR "Unit 1 Spent Fuel Pool Portable Demineralization"
- 7.1.2 Provisional Operating License DPR-5 Appendix A Indian Point Station Unit 1 Docket No. 50-3 – Technical Specifications
- 7.1.3 Indian Point 1 Safety Analysis Report

7.2 DEVELOPMENT DOCUMENTS

- 7.2.1 ABS Consulting Drawing #1792949-D-001 (EC 7981), Unit 1 West Storage Pool Portable Demineralizer System P&ID
- 7.2.2 ABS Consulting Drawing #1570688-D-006, Unit 1 West Pool Demineralizer Skid and Piping Arrangement

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ATTACHMENT 9.1

BASE VALVE ALIGNMENT

Sheet 1 of 1

Valve No.	Identification	Position	Initial
# none	Pre-Filter Vent	Close	
# none	Pre-Filter Drain	Close	
# none	Post-Filter Vent	Close	
# none	Post-Filter Drain	Close	
None	Vessel Ext. Sluice IN	Close	
None	Vessel Ext. Sluice OUT	Close	
## none	Vessel Bypass	Close	
## none	Vessel Sluice In	Close	
## none	Vessel Sluice Out	Close	
## none	Vessel Inlet or Sparge	Open	
## none	Vessel Outlet	Open	
VLV-020	Suction Priming Water Supply	Close	
VLV-036	P01 Suction Pressure Indication Isolation	¼ to ½ Open	
VLV-037	P02 Suction Pressure Indication Isolation	¼ to ½ Open	
VLV-022	AOD Pump Suction	Close	
VLV-023	AOD Pump Discharge	Close	
VLV-002	AOD Pump Isolation / Bypass	Open	
VLV-003	Pump Inlet Isolation	Open	
VLV-024	Discharge Priming Water Supply	Close	
VLV-026	Influent Sample Point	Close	
VLV-027	By-pass Isolation	Close	
VLV-029	Pre-Filter Supply	Close	
VLV-030	Pre-Filter Discharge	Close	
VLV-004	Pre-Filter Isolation / Bypass	Open	
VLV-031	Post-Filter Supply	Close	
VLV-032	Post-Filter Discharge	Close	
VLV-033	Effluent Sample Point	Close	
VLV-006	Post-Filter Isolation / Bypass	Open	
VLV-007	Effluent Control Header Isolation / FM-A Inlet	Open	
VLV-008	Effluent Control Header Isolation / FM-A outlet	Close	
VLV-009	Effluent Control Header Isolation / FM-A Bypass	Close	
VLV-005	Pump Outlet Isolation	¼ to ½ Open	
VLV-034	Return Line Vent Isolation	Close	
VLV-010	Return Line Isolation	¼ to ½ Open	
VLV-040	Post-Filter Train Inlet Stop	CLOSED	
VLV-041	Post-Filter Train Outlet Stop	CLOSED	
VLV-042	PV-1 Vent	CLOSED	
VLV-043	PV-2 Vent	CLOSED	

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ATTACHMENT 9.2

CHECKLISTS A AND B

Sheet 1 of 1

Checklist A

Checklist A identifies all Portable Demineralization System components that directly interface with plant systems while in use. Initial when item is set up according to procedure, perform independent verification step.

Date:		Initials	Verification
1.	Piping installed in pool and attached to valve station skid.		
2.	Containment berm installed, OSSC and internal vessel located, valve station and pump skid connected.		
3.	Piping between valve station skid and flex connections to vessel (inside OSSC at lid opening) connected.		
4.	AOD Priming Pump (back-up pump) connected for initial priming.		
5.	Water/Air supply hose with double check valves, connected for initial priming.		
6.	Primary power supply (480V – pump) and ancillary power supply (110V – flow meters, alarm) connected.		
7.	Shift Manager notification of installation.		

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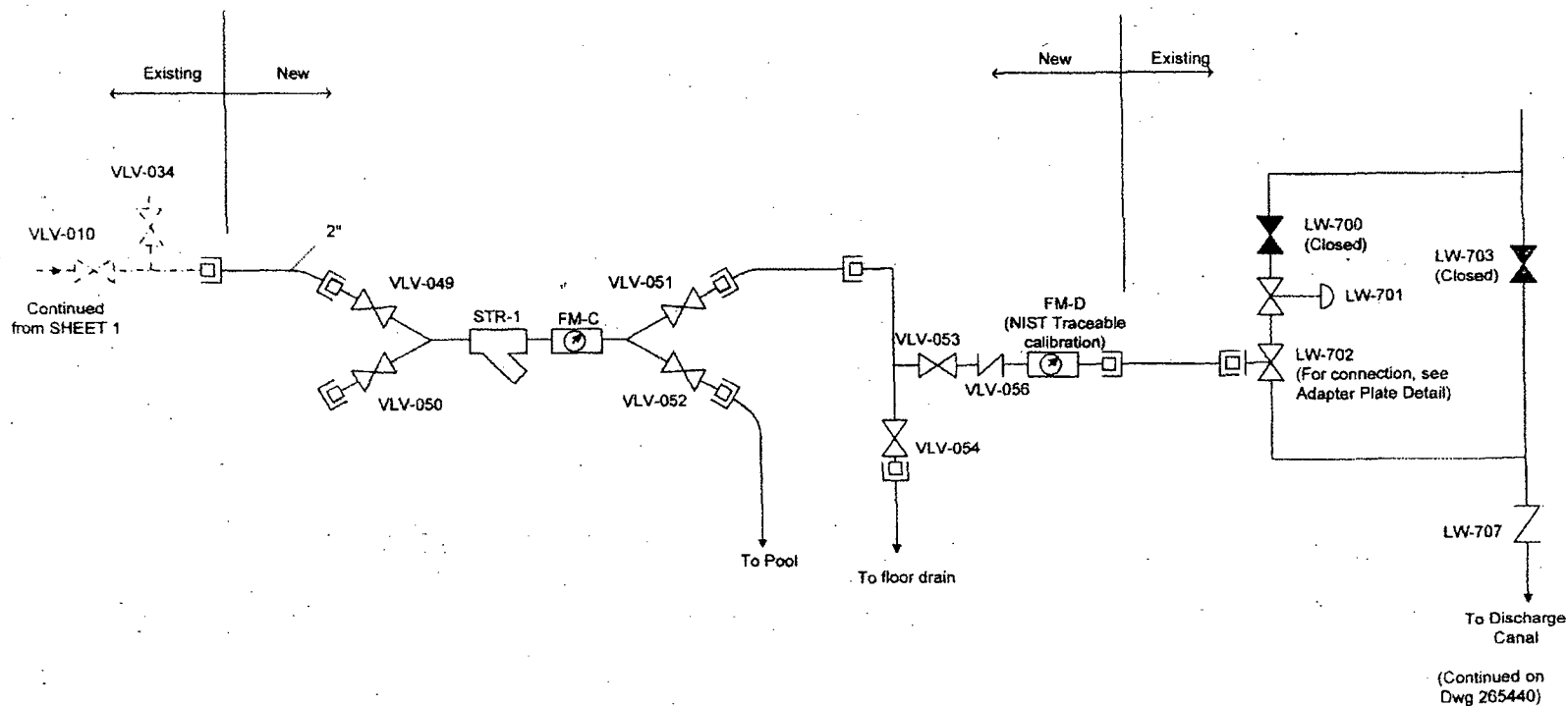
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ATTACHMENT 9.3

TASK SIGN-OFF SHEET

Sheet 1 of 1

Date:		Initials	Verification
1.	Resin media used approved by Radwaste/Chemistry.		
2.	Insure all permits are valid (RWP/WP).		
3.	System leak tested to 90 psi and held for 5 minutes after initial setup. (Repeat this set up any time system is breached.)		
4.	Operations notified prior to initial setup, or following restart.		
5.	Suction in pool, and secure.		
6.	Walk-down system, identify any discrepancies. (Write 'none' if no discrepancies identified.)		
7.	After startup, walk system down for leaks. Shut system down if any leaks identified. Notify RP and Radwaste Supervisor.		
8.	Record totalizer reading at start of operation.		



EC 7981

ABS Drawing 1792949-D-001 Sheet 2