

TRANSFER OF RESIN BETWEEN LINERS

1.0 SCOPE

1.1 Purpose

This document contains the instructions for transferring bead-type resins from CNSI 14-195H cask with Hic liner to CNSI 6-80 cask with Hic liner.

1.2 Applicability

The instructions contained in this procedure apply only to transferring bead-type resins in CNSI vessels which are referenced in Section 2.0.

2.0 REFERENCES

- 2.1 CN-AD-003 CNSI Procedure for Document Preparation
- 2.2 CN-AD-019 CNSI ALARA Policy
- 2.3 QA-AD-001 CNSI Quality Assurance Program
- 2.4 B-340-D-0015 Resin Transfer & Dewatering Plant Service Skid
- 2.5 FO-OP-015 Rev. 0 Operating Procedure for Resin Transfer & Dewatering of Bead-Type Resins
- 2.6 FO-AD-002 Rev. 6 Operating Guidelines for Use of Polyethylene High Integrity Containers

3.0 SYSTEM DESCRIPTION

3.1 General

The bead resin will be transferred from the 14-195 liner in cask to the 6-80 liner in cask. The casks will be removed from the trailers in accordance with CNSI procedures TR-OP-010 Revision C and TR-OP-008 Revision E and positioned as directed by the customer and CNSI operating personnel.

CNSI will provide transfer and dewatering hoses as necessary. The customer will supply service water or DI water and air supply hoses. CNSI technicians shall make all hose connections to CNSI equipment and liners where applicable exposure limits will allow. CNSI technicians shall operate transfer and dewatering system and monitor liquid levels in liners during transfer.

3.2 Equipment Description & Setup

The resin transfer/dewatering control skid includes two air-driven, positive-displacement pumps, control valves, sample points and service connections. One pump is to be used to transfer the resin from the 14-195 liner to the 6-80 liner. The other pump is to dewater the 6-80 liner back to the 14-195 liner to maintain proper water to resin ratio for resin sluicing and to dewater the 6-80 in accordance with CNSI FO-OP-003.

4.0 REQUIREMENTS

4.1 CNSI Equipment & Supplies

- 4.1.1 Resin transfer/dewatering control ski
- 4.1.2 System hoses (refer to Table 1)
- 4.1.3 Liner level monitor system
- 4.1.4 Sight glass (in line) 1½" M X 1½" F quick connects
- 4.1.5 Air control skid
- 4.1.6 Sluice wand with cage
- 4.1.7 PVC pipe and assorted fittings

4.2 Utility Support Services

- 4.2.1 Service Air: 20 SCFM @ 100 ± 20 psig
- 4.2.2 Service/DI Water: 20 GPM @ 80 ± 20 psig
- 4.2.3 Electrical Power: 120 volts, single phase, 15 amps
- 4.2.4 Crane services, torque wrenches, and other material necessary for removing and replacing casks, cask lids and moving the system equipment to and from the designated area(s).
- 4.2.5 Controlled drain for contaminated water.
- 4.2.6 Protective clothing & dosimetry for CNSI personnel.
- 4.2.7 Protective covering for CNSI hoses and equipment.
- 4.2.8 A 12' ladder for climbing onto casks.
- 4.2.9 In-plant telephone service with which incoming and outgoing business calls may be made by the CNSI personnel.
- 4.2.10 Preparation of the designated area to control contamination, including casks and equipment.
- 4.2.11 Personnel to aid in the event exposure limitations to CNSI personnel are necessary.

5.0 SAFETY

5.1 Industrial Safety

CAUTION: HOSES & OTHER PRESSURE RETAINING COMPONENTS MAY BE PRESSURIZED DURING DISASSEMBLY. FACE SHIELDS & APPROPRIATE PROTECTIVE CLOTHING MUST BE WORN DURING DISASSEMBLY OF THIS EQUIPMENT.

5.1.1 The CNSI technician(s) shall wear safety glasses and/or full-face shield while working within 5' of a system which has been pressurized.

5.1.2 The CNSI technician(s) shall wear safety glasses and safety shoes while performing his duties in the process area.

5.2 Radiological Safety

5.2.1 The CNSI technician shall follow the proper radiological precautions at all times to minimize the spread of contamination and to limit personnel exposure to ionizing radiation.

5.2.2 The CNSI technician shall wear dosimetry equipment and protective clothing as specified by the radiation work permit, or equivalent, during all operations covered by same.

5.3 Precautions & Limitations

5.3.1 Strong oxidizing agents such as nitric acid, when in contact with organic ion-exchange material and in the presence of air, may produce a slightly degraded resin in an exothermic reaction up to an explosion.

5.3.2 After establishing plant interface connections (service air, service water, electrical power, etc.), these services supplied by the utility shall not be interrupted or modified without prior notification to the CNSI technician(s).

5.3.3 Any modifications of CNSI equipment or operating procedures shall be performed in accordance with CNSI procedures: CN-AD-003, QA-AD-001, and EN-AD-002. Any modifications shall be approved by the cognizant CNSI departments and concurred with the utility prior to implementing the change.

5.3.4 Any deviation from this procedure which results in a potential or real hazard to the CNSI technician(s) or the utility's personnel shall be reported to CNSI in accordance with CNSI procedures: CN-EM-001 or CN-AD-005.

6.0 PREREQUISITES

- 6.1 Prior to installing the resin transfer/dewatering system, the CNSI technician shall obtain a RWP, or equivalent, from the utility's HP department.
- 6.2 Prior to operation of the resin transfer/dewatering system, the CNSI technician shall:
 - 6.2.1 Verify that the RWP, or equivalent, is up-to-date.
 - 6.2.2 Verify that a daily radiation and contamination survey report is available. A copy of this report should be retained with the permanent records for the system.
 - 6.2.3 Enter into daily operations log that the above items have been verified.

7.0 INSTALLATION PROCEDURE

7.1 Area Preparation

- 7.1.1 The customer shall prepare the area in accordance with customers procedures and policies.
- 7.1.2 The liner and cask shall be covered by Herculite, or equivalent, to prevent the spread of contamination.

7.2 Equipment Setup

CAUTION: PORTIONS OF THE RESIN TRANSFER SYSTEM MAY BE CONTAMINATED. THE TECHNICIAN(S) SHALL OBSERVE STANDARD RADIOLOGICAL PRACTICES TO PREVENT THE SPREAD OF CONTAMINATION.

NOTE: ALL HOSE QUICK CONNECTS SHALL BE SECURED WITH DUCT TAPE TO PREVENT INADVERTENT DISCONNECTION.

- 7.2.1 Remove secondary lid from 6-80 cask and liner and cover sides of opening from cask top to liner opening with Herculite or equivalent.
- 7.2.2 Connect level sensing cable to control box and test.
- 7.2.3 Position resin transfer/dewatering control skid near cask/liner.
- 7.2.4 Inspect 6-80 liner internals for damage which may have occurred in shipment.

7.2.5 Remove secondary lid from 14-195H cask and liner, and prepare opening as best as possible within limits of exposure.

NOTE: DOSE READINGS MAY EXCEED 10R AT OPENING OF 14-195 LINER.

7.2.6 Fill 14-195 liner with DI water for shielding and sluicing, continuously monitor level by instrumentation or visually in liner until full.

7.2.7 Connect resin discharge hose to P1 discharge and to 6-80 waste inlet connection.

7.2.8 Connect dewatering suction hose to P2 suction and to 6-80 primary dewatering connection.

7.2.9 Connect dewatering discharge hose to P2 discharge and to waste inlet connection on 14-195 (it will be necessary to connect a 1½" M X 2" F quick connects spool piece to end of hose first).

7.2.10 Connect 1½" M X 1½" F sight glass (SG-1) to P1 suction connection.

7.2.11 Connect resin suction hose to sight glass on P1 suction, and connect other end to sluice wand with cage attachment.

7.2.12 Connect service air from air supply skid to P1 & P2 (verify valves are closed).

7.2.13 Connect service air from air supply skid to plant air connection.

7.2.14 Connect DI water hose from plant connection to service water connection on control skid (WS-3).

7.3 Leak Test Procedure

7.3.1 Establish or verify that all valves are closed.

7.3.2 Verify that the customer's feed isolation valve is closed.

7.3.3 Open DI water isolation valve to supply flushing water.

7.3.4 Open SW-1 and DW-5 then open DW-1.

7.3.5 When water is verified discharging from dewatering suction and discharge lines, close SW-1 then DW-5 and DW-1.

7.3.6 Place resin sluice wand in an appropriate collection receptical such as the liner or drum.

- 7.3.7 Open SW-4 and WS-1, then open WS-2.
- 7.3.8 When water is verified, discharge from resin sluice wand and resin discharge hose close SW-4 then WS-1 and WS-2.
- 7.3.9 Visually observe all connections for leaks. If none are observed, continue to Step 7.3.11.
- 7.3.10 If any leaks are observed, shut the utility's DI water supply valve and open WS-3 and DW-6 to relieve pressure and partially drain lines. Repair any observed leaks and repeat Steps 7.3.3 through 7.3.9.
- 7.3.11 Close all valves and notify customer that leak test has been completed satisfactorily.

8.0 OPERATING PROCEDURE

8.1 Initial Conditions

CAUTION: STRONG OXIDIZING AGENTS SUCH AS NITRIC ACID, WHEN IN CONTACT WITH ORGANIC ION-EXCHANGE MATERIAL AND IN THE PRESENCE OF AIR, MAY PRODUCE A SLIGHTLY DEGRADED RESIN IN AN EXOTHERMIC REACTION, UP TO AN EXPLOSION. THE FIRST INDICATION OF AN EXOTHERMIC REACTION DUE TO THE PRESENCE OF OXIDIZING AGENTS IS SOME FUMING AND A SLIGHT RISE IN TEMPERATURE ON THE OUTSIDE OF THE CONTAINER. IF THIS CONDITION IS FOUND WHEN DEWATERING A VESSEL, THE IMMEDIATE ACTION TO BE TAKEN IS TO REFILL THE VESSEL WITH WATER. THIS WILL ELIMINATE ONE OF THE INGREDIENTS NECESSARY FOR THE REACTION (AIR) AND WILL DISSIPATE THE MAJORITY OF THE HEAT, RETURNING THE TEMPERATURE OF THE VESSEL TO AMBIENT. THIS IS A STABLE CONDITION. THEN, YOUR IMMEDIATE SUPERVISOR MUST BE NOTIFIED.

- 8.1.1 The system has been installed per section 7.0.
- 8.1.2 The 14-195 liner with resin has been fluidized.

8.2 Operations

- 8.2.1 Place sluice wand in 14-195 liner if not already done.

NOTE: THE WAND MUST BE LOWERED SLOWLY TO AVOID PLUGGING.

- 8.2.2 Establish service air to air supply skid and to pumps. Adjust air regulator to necessary level.
- 8.2.3 Open WS-1 and WS-2.

- 8.2.4 Open air to P1 and adjust to necessary level to sluice resin.
- 8.2.5 Lower wand in resin as necessary to sluice and retain proper water to resin ratio.
- CAUTION: EXPOSURE LEVEL ON PUMPS MAY RISE DRAMATICALLY.
- CAUTION: CONTINUOUSLY MONITOR LEVEL IN 6-80 CASK BY INSTRUMENTATION OR VISUALLY.
- 8.2.6 Open DW-5 and DW-1.
- 8.2.7 Adjust air to P2 to maintain proper dewatering rate of 6-80 liner and to maintain proper water to resin ratio in 14-195 liner.
- 8.2.8 Continue transfer until high level alarm on 6-80 is indicated, then stop transfer and dewater 6-80.
- 8.2.9 If alarm is cleared and visual inspection allows more resin, repeat Steps 8.2.3 through 8.2.8 until 6-80 liner is full.
- NOTE: WHEN RESIN NEARS UPPER THIRD OF 6-80 LINER, IT MAY BE ADVISABLE TO STOP OR SLOW DEWATERING, THIS WILL ALLOW THE RESIN TO LEVEL OFF AND AVOID THE COMING EFFECT. IT MAY BE NECESSARY TO ADD MORE DI WATER IN THIS EVENT TO KEEP THE RESIN IN THE 14-195 LINER SLUICABLE. IF MORE DI WATER IS ADDED, BE CAUTIOUS OF LEVELS IN BOTH LINERS. KEEP ADDITIONAL WATER TO A MINIMUM.
- 8.2.10 When transfer is complete, flush transfer lines by opening SW-4 and WS-1, then close WS-1 and open WS-2. Each hose should be flushed for 5 to 10 minutes. Be cautious of both liner levels.
- 8.2.11 Close all transfer valves and flushing valves - WS-1, WS-2 and SW-4.
- 8.2.12 Set up hoses as necessary for dewatering of 6-80 liner per appropriate procedures (FO-OP-003) and continue until completion of same.
- 8.2.13 After completion of dewatering, remove all hoses and monitor cables as necessary to prepare cask and liner for shipment.

9.0 SYSTEM REMOVAL

- 9.1 Drain water from all hoses and pipes.
- 9.2 Cap or plug all contaminated hoses.
- 9.3 Place contaminated hoses in LSA type containers; i.e., 55-gallon drums or boxes.
- 9.4 Cap all contaminated pipes.
- 9.5 Place resin transfer/dewatering control skid in LSA shipping container.
- 9.6 Label all shipping containers in accordance with DOT shipping regulations.
- 9.7 Notify the customer's HP department to survey all equipment and obtain a radioactive shipment record completed by the customer to ship the equipment to the designated receiver.
- 9.8 All preparations for shipment should be per procedure FO-AD-007 and checklist of same completed.

TABLE 1

HOSE LIST

1 - 20' X 1½" F X F quick disconnect, non-collapsible

4 - 25' X 1½" F X F quick disconnect, non-collapsible

2 - 5' X ½" black air hose F X M aro quip

* Air supply hose to customer connection to be supplied by customer

* DI water supply hose with gate valve to be supplied by customer

TABLE 2SPARE PARTS LIST

- 1 - Sluice wand 1½" X 10' PVC with 1½" M quick connect and cage attachment
- 1 - Fava level control box, 110 volt power supply
- 1 - 1½" M X 2" F quick connect
- 1 - 1½" F quick connect X ¾" aro quip
- 1 - 1½" F X 1½" F spool piece w/strainer - quick connect
- 1 - 1½" F X 1½" M sight glass - quick connect
- 1 - 1½" F X 1½" F quick connect
- 1 - 1½" M X 1½" M quick connect
- 1 - ¾" Chicago X ¾" quick connect
- 1 - Tool box w/assorted tools
- PVC primer & glue
- Extra Warren Rupp pump lubricating oil
- Hose clamps
- Extra 1½" caps and plugs for quick connect
- Extra 1" and 1½" PVC pipe
- Extra PVC fittings (assorted)

RESIN TRANSFER/DEWATERING SYSTEM FLOW DIAGRAM

