



ARKANSAS POWER & LIGHT COMPANY

Arkansas Nuclear One

TITLE: RECORD OF CHANGES AND REVISIONS

FORM NO. 1000.06A

SPECIAL WORK PLANS

REV. # 8 PC #

RESIN TRANSFER FROM 2T13

2409.13

REV. 2

UN - Controlled Copy

62

PAGE	REV	PC#	PAGE	REV	PC#	PAGE	REV	PC#	PAGE	REV	PC#	PAGE	REV	PC#
1	2													
2	2													
3	2	3												
4	2	3												
5	2	2												
6	2													
7	2													
8	2													
9	2													
10	2													
11	2													
12	2	3												
13	2													
14	2													
15	2													

APPROVED BY:

APPROVAL DATE

James M. Levine
(General Manager)

8/2/82

REQUIRED EFFECTIVE DATE:



ARKANSAS POWER & LIGHT COMPANY

Arkansas Nuclear One

TITLE: FRONT COVER SHEET

FORM NO. 1000.05B

TITLE:

RESIN TRANSFER FROM 2T13

ASSIGNED NO.

2409.13

REV.

2

Affected Unit ANO-1 ☒ ANO-2 ☒

Procedure ☐ Workplan ☒

Safety Related Yes ☒ No ☐

Page 1 of 15

Activity/Job Order No. _____

Equipment No. _____

Work Performed By _____

Date Begin _____ Date Completed _____

Reviewed and Approved By _____ Date _____

ADDITIONAL TOOLS/EQUIPMENT REQUIRED

TEST EQUIPMENT USED

Tool List Updated By:

_____/_____

Supervisor

Date



PLANT MANUAL SECTION:

PROCEDURE/WORK PLAN TITLE:

NO:

SPECIAL WORK PLANS

RESIN TRANSFER FROM 2T13

2409.13

ARKANSAS NUCLEAR ONE

PAGE 2 of 15

REVISION 2 DATE 10/15/81

CHANGE DATE

This plan is intended to outline the required steps and conditions necessary to transfer spent resins from 2T-13 to (transport) shipping cask located in the train bay or to the Unit 1 Spent Resin Tank (T-13).

1.0 LIMITS & PRECAUTIONS

- 1.1 Personnel must be stationed at all times at both the liner and the resin transfer pump controls during resin transfer operations to the liner.
- 1.2 The train bay shall be roped off around the shipping cask and no access allowed to personnel other than those involved with this operation.
- 1.3 All personnel, including HP's, shall be thoroughly briefed in all areas of this operation prior to commencing resin transfer.
- 1.4 Clearance must be granted (indicating necessary documentation is met) prior to resin fill & prior to allowing the transport to leave the plant after loading.
- 1.5 Radiation levels on the exterior of the cask cannot exceed 70-80 mR/hr.

2.0 INITIAL CONDITIONS

- 2.1 Heavy poly shall be placed on floor of train bay to cover work area under and around cask trailer, after trailer is placed drape poly over trailer. See Figure 1.
- 2.2 SWP issued and signed for work involved.
- 2.3 HP personnel available and briefed on operations to be conducted.
- 2.4 All hosing and rigging is connected as indicated on Figure 2 (attached).
- 2.5 Mirror mounted on cask for level observation.
- 2.6 Demineralized water hose available for flushing in area of transport.
- 2.7 Internals removed from check valve (2SZ-40) from de-water line to RT 10.
- 2.8 170 ft³ liner installed in cask per applicable portions of Appendix "A", attached.
- 2.9 Valve Lineup completed per Att. C.



PLANT MANUAL SECTION:

PROCEDURE/WORK PLAN TITLE:

NO:

SPECIAL WORK PLANS

RESIN TRANSFER FROM 2T13

2409.13

ARKANSAS NUCLEAR ONE

PAGE 3 of 15

REVISION 2 DATE 10/15/81

CHANGE PC-3 DATE 08/11/82

3.0 RESIN TRANSFER TO (TRANSPORT) SHIPPING CASK**3.1** Open 2SZ-42, 2SZ-20.**3.2** Line up S.A. manifold in Unit 2 Spent Fuel D.I. Room check open 2SA-46.**3.3** Open 2SA-98 as necessary (about 15# on Local Gauge) to fluff resin for ~ 60 minutes.**3.3.1** After 60 minutes, close 2SZ-20 (2SZ-42 must remain open or 2PIS-4213 will be isolated).**3.3.2** Pressurize 2T-13 to ~ 30 PSI as indicated on 2PIS-4213 at 2C113, then close 2SA-98.**3.4** Ensure hose is attached per Page 12. Open hose connection valves A, (Unit 1).**3.4.1** Open 2SZ-41, 2SZ-8, 2SZ-7, 2SZ-43 and 2SZ-49 (Unit 1).**3.4.2** Open 2CVC-98 to flush lines and verify flow to cask, establish flow rate ~ 50 gpm on 2FI-2032.**3.4.3** Close 2SZ-7 and 2SZ-8 when lines are cleared.**3.5** Crack open 2SZ-9 to restore 2T-13 pressure to ~30 psig, then close 2SZ-9.**3.6** Open 2SZ-1.**3.6.1** Open 2SZ-51 ~3 turns to establish slurry flow. Verify flow at resin cask. Throttle 2SZ-51 as necessary to maintain desired slurry density.**3.6.2** Open 2SA-98 to add air to tank.**NOTE:**

It may be necessary to throttle 2SZ-9 and
2SA-98 to maintain 2T-13 pressure of N30 psig.

3.7 Operate portable de-watering pump intermittently as necessary to hold level down in cask liner.**3.8** When desired resin level in cask is reached, shut 2SZ-9, 2SZ-51, 2SZ-1, 2SA-98.**3.8.1** Open 2SZ-7 and 2SZ-8 and flush line to cask until resin free water emerges at cask, then shut 2SZ-7, 2SZ-8, 2SZ-43, 2SZ-41, 2CVC-98, hose connection valves - A & 2SZ-49.



PLANT MANUAL SECTION:

PROCEDURE/WORK PLAN TITLE:

NO:

SPECIAL WORK PLANS

RESIN TRANSFER FROM 2T13

2409 13

ARKANSAS NUCLEAR ONE

PAGE

4 of 15

REVISION

2

DATE

10/15/81

CHANGE

PC-3

DATE

08/11/82

3.9 Continue de-watering cask as necessary until pump loses suction.

NOTE:

Allow cask to settle after completing resin transfer for two hours. Run de-watering pump until pump again loses suction. If pump operates for over one minute prior to losing suction, wait another two hours and repeat de-watering operation. Continue until resin is dry.

3.10 After radwaste system is flushed and secured, disconnect all temporary hosing.

NOTE:

If lines become clogged with resin slurry, see backflush procedure in Section 4.0.

3.11 Take resin sample for radioisotope analysis.

3.12 Complete resin solidification per Appendix "B".

3.13 Complete as necessary documentation for shipment and release truck. Clean up area as required.

3.14 Reinstall check valve internals removed in Step 2.7.

3.15 Close all valves on Attachment C except 2SZ-42 (2T13 vent) and ABD-1.

4.0 RESIN TRANSFER FROM 2T13 TO T13

4.1 Open 2SZ-42, 2SZ-20.

4.2 Check open 2SA-46.

4.3 Open 2SA-98 as necessary ($\sim 15^{\#}$ on local gauge) to fluff resin for ~ 60 minutes.

4.3.1 After 60 minutes, close 2SZ-20 (2SZ-42 must remain open or 2PIS-4213 will be isolated).

4.3.2 Pressurize 2T-13 to ~ 30 psi as indicated on 2PIS-4213 at 2C113, then close 2SA-98.

4.4 Ensure Unit 1 valves are aligned as follows:

4.4.1 Close RT-11.

4.4.2 Check closed SA-22, SA-24, SA-125, CZ-36, CZ-68, CZ-1042, CZ-1060, CZ-1061, CZ-1062, RT-12, RT-13, ABD-19, 2SZ-49, and ABD-1801.



PLANT MANUAL SECTION:

PROCEDURE/WORK PLAN TITLE:

NO:

SPECIAL WORK PLANS

RESIN TRANSFER FROM 2T13

2409.13

ARKANSAS NUCLEAR ONE

PAGE 5 of 15

REVISION 2 DATE 10/15/81

CHANGE FC-2 DATE 10/30/81

4.4.3 Open RT-10, ABD-18, GCH-5, GCH-36.

NOTE

When flushing and transfer operations are in progress, all drains from T-13 are collected in T-11 (Aux. Bldg. Equip. Drain Tank). Level in T-11 should be monitored by Unit 1 WCO.

4.5 Ensure Unit 2 valves are aligned as follows:

4.5.1 Check closed 2SZ-45, 2CV-4212.

4.5.2 Open 2SZ-41, 2SZ-8, 2SZ-7, 2SZ-43, 2SZ-2.

4.5.3 Ensure 2SZ-49 (In Unit 1) is closed.

NOTE

Communications should be established between Unit 1 and Unit 2 WCO's.

4.5.4 Open 2CVC-98 to flush lines and verify flow to T-13. Establish a 50 gpm flow rate on 2FI-2032.

4.5.5 Close 2SZ-7 and 2SZ-8 after flushing for a minimum of five minutes.

4.6 Crack open 2SZ-9 to restore 2T-13 pressure to ~30 psig, then close 2SZ-9.

4.7 Open 2SZ-1.

4.7.1 Open 2SZ-51 ~3 turns to establish slurry flow. Verify flow to T-13. Throttle 2SZ-51 as necessary to maintain desired slurry density.

4.7.2 Open 2SA-98 to add air to 2T-13.

NOTE

It may be necessary to throttle 2SZ-9 and 2SA-98 to maintain 2T-13 press. of ~30 psig.

4.8 When 2T-13 is empty or desired resin level is reached, shut 2SZ-9, 2SZ-51, 2SZ-1, and 2SA-98.

4.8.1 Open 2SZ-7 and 2SZ-8 and flush line to T-13 for 5 minutes, or until all resin is flushed from lines. Then shut 2SZ-7, 2SZ-8, 2SZ-43, 2SZ-41, and 2CVC-98.

4.9 When T-13 has drained down, shut RT-10, ABD-18, GCH-5, GCH-6.



PLANT MANUAL SECTION:

SPECIAL WORK PLANS

PROCEDURE/WORK PLAN TITLE:

RESIN TRANSFER FROM 2T13

NO:

2409.13

ARKANSAS NUCLEAR ONE

PAGE 6 of 15

REVISION 2 DATE 10/15/81

CHANGE DATE

5.0 BACKFLUSH PROCEDURE

- 5.1 If resin transfer is in progress, shut 2SZ-51. If line flush is in progress, shut 2SZ-7 and 2SZ-8.
- 5.2 Shut hose connection valve 'A'.
- 5.3 Open 2SZ-10 and 2SZ-20.
- 5.4 Install hose at backflush connection upstream of hose connection valve 'A'.
- 5.5 Alternate flushing through this hose from Unit 1 C.T. on S.A. headers until line is believed to be cleared.
- 5.6 Isolate/remove hose installed in 4.4.
- 5.7 Shut 2SZ-10 and 2SZ-20.
- 5.8 If resin transfer was interrupted, open (throttle) 2SZ-51 to resume transfer. If line flush was interrupted, open 2SZ-7 and 2SZ-8 to resume flush.



PLANT MANUAL SECTION:

PROCEDURE/WORK PLAN TITLE:

NO:

SPECIAL WORK PLANS

RESIN TRANSFER FROM 2T13

2409.13

ARKANSAS NUCLEAR ONE

PAGE 7 of 15

REVISION 2 DATE 10/15/81

CHANGE DATE

APPENDIX A

Page 1 of 2

LOADING PROCEDURE FOR THE

HN-100 SERIES UPRIGHT CYLINDRICAL RADWASTE SHIPPING CASK**A. APPLICABILITY**

This procedure is applicable for both the HN-100 Cask and the HN-100S Casks.

B. PAYLOAD

The HN-100 Cask will be loaded with one of the following payloads:

1. Drum Pallets

Fourteen 55 gallon drums loaded onto two 7 drum pallets placed one on top of the other.

2. Shielded Pallets

Eight 55 gallon drums loaded into two 4 drum pallets placed one on top of the other in the cask.

3. Large Containers

170 ft³ large container loaded directly into the cask.

C. PROCEDURE**1. Remove the full diameter cask lid as follows:**

- a. On casks equipped with bolted lid closure system, remove the lid holddown bolts.
- b. On casks equipped with ratchet binder lid closure system, loosen and disconnect the ratchet binders.
- c. Using the three (3) lifting lugs on the cask lid to accomodate suitable rigging and using caution in the placement of the cask lid due to possible contamination of the underside of the lid, remove the cask lid.



PLANT MANUAL SECTION:

SPECIAL WORK PLANS

PROCEDURE/WORK PLAN TITLE:

RESIN TRANSFER FROM 2T13

NO:

2409.13

ARKANSAS NUCLEAR ONE

PAGE 8 of 15

REVISION 2 DATE 10/15/81

CHANGE DATE

APPENDIX A

Page 2 of 2

2. Loading shall be as follows:

- a. Loading the seven (7) drum standard pallets or the four (4) drum shielded pallets in the cask.

- (1) Load the drums into the pallets.
- (2) Assure easy access to the pallet lifting slings for removal of pallet at burial.

- b. Loading the seven (7) drum standard pallets or the four (4) drum shielded pallets outside the cask.

- (1) Using the lifting slings provided with the pallets and using caution in the placement of the pallet due to possible contamination of the pallet, remove the pallets from the cask.
- (2) Load the drums into the pallets.
- (3) Lift loaded pallet and place it inside cask.
- (4) Assure easy access to the pallet lifting slings for removal of pallet at burial.

- c. Loading the 170 ft³ liner in the cask.

- (1) Insure that the snap-on lid is with the liner.
- (2) Using the slings provided, place liner in the cask. Insure that the slings remain with the liner.
- (3) Place cask lid on cask using alignment pins to assure proper placement.
- (4) On casks equipped with bolted closure, secure the cask lid by installing and tightening the holddown nuts.
- (5) On cask equipped with ratchet closure system, secure the cask lid by connecting and tightening the ratchet binders.
- (6) Remove the shield plug holddown nuts.
- (7) Using caution due to possible contamination of the underside of the shield plug, remove the shield plug.



PLANT MANUAL SECTION:

PROCEDURE/WORK PLAN TITLE:

NO:

SPECIAL WORK PLANS

RESIN TRANSFER FROM 2T13

2409.13

ARKANSAS NUCLEAR ONE

PAGE 9 of 15

REVISION 2 DATE 10/15/81

CHANGE DATE

APPENDIX B

Page 1 of 3

For Use at the Arkansas Nuclear I Plant1. INSTALLATION

- 1.1 Position the truck in the designated area. On the truck will be a resin filled liner in a cask.
- 1.2 Place electric drive assembly in liner neck and secure tightly with the three mounting bolts.
- 1.3 Construct and position scaffold so that the cement feed adaptor outlet is properly located relative to the cement inlet on the mixing head.

NOTE:

The difference in elevation of the Flexcon screw drive ends which connect the cement feed adaptor to the cement inlet on the mixing head should not exceed 12". The cement inlet on the mixing head varies in height between 11'7" and 13'1", depending on the truck. Adjust the height of the scaffold to comply with the height of the cement inlet on the mixing head.

- 1.4 Install the screw drive starting at the cement feed adaptor. Remove the end cap and insert the screw drive into the adaptor and beyond the uncapped end. Now insert the other end into the cement inlet on the mixing head. After insertion into the cement inlet, the end cap on the cement feed adaptor can be put back on.

NOTE:

It may be necessary to adjust the position of the scaffold slightly in order to install the screw drive.

- 1.5 Fill both cement bins and install them on the scaffold with both blast gates closed. The numbers on the bin legs should coincide with the numbers on the scaffold.
- 1.6 Connect the air lines to air vibrators on both cement bins.
- 1.7 Position the dust collector in a convenient location allowing the vent hose to reach the mixing head. Attach the vent hose to the dust collector and the vent pipe on the mixing head.
- 1.8 Add the correct amount of water to the liner. The amount of water varies with the amount of resins to be solidified. This amount should comply to Appendix A.
- 1.9 Position the control panel and connect the electrical lines from the agitator motor, screw drive motor, electric drive motor and the dust collector to the corresponding receptacles.



PLANT MANUAL SECTION:

PROCEDURE/WORK PLAN TITLE:

NO:

SPECIAL WORK PLANS

RESIN TRANSFER FROM 2T13

2409.13

ARKANSAS NUCLEAR ONE

PAGE 10 of 15

REVISION 2 DATE 10/15/81

CHANGE DATE

APPENDIX B

Page 2 of 3

II. SOLIDIFICATION OPERATIONS

- 2.1 Energize the control panel.
- 2.2 Start the dust collector by pressing the "Start" button labeled DUST COLLECTOR on the panel.
- 2.3 Start the mixing blade in the Forward direction by pressing the "Forward" button labeled MIXER.

NOTE:

The forward and reverse mechanisms inside the control panel have time delays built in. The time delay allows the mixing blade to come to a complete stop before the blade direction can be changed. After pressing the stop button, the operator is forced to wait for the amount of time set on the time delays before re-energizing the mixer motor.

- 2.4 Start the agitator and screw drive simultaneously by pressing the "start" button labeled CEMENT FEED.

NOTE:

The blast gates on both cement bins should still be closed to assure no cement flow as yet. When the cement is finally allowed to flow, keep the top blast gate closed until the bottom bin is near empty.

- 2.5 Start the air vibrator on the lower bin just enough to keep the cement moving but not enough to cause packing.
- 2.6 From Appendix A select the required amount of cement needed to solidify the resin. Knowing that the flow rate of cement is 55 pounds per minute once the blast gate is opened and knowing how much cement must be transferred, the operator can determine how long he must open the gate to complete the transfer. The minutes the gate must be opened can be determined by dividing the pounds of total cement to be transferred by the flow rate of cement (pounds per minute). Open the blast gate for the length of time calculated above. Be sure to open the top blast gate and energize the top air vibrator before the bottom bin empties. After the time is up, close the gate but allow the screw drive to empty.

III. SHUTDOWN OPERATIONS

- 3.1 When the cement transfer is completed, turn off the vibrators and cement feed unit. Allow dust collector to run while the mixer is still operating. Continue mixing until a satisfactory mix is achieved then turn off mixing motor and dust collector.



PLANT MANUAL SECTION:

PROCEDURE/WORK PLAN TITLE:

NO:

SPECIAL WORK PLANS

RESIN TRANSFER FROM 2T13

2409.13

ARKANSAS NUCLEAR ONE

PAGE 11 of 15

REVISION 2 DATE 10/15/81

CHANGE DATE

APPENDIX B

Page 3 of 3

- 3.2 Unplug the electric cables going to the control panel and wrap each one around their motors.
- 3.3 Remove plug on the cement feed adaptor and loosen the clamps on both ends of the screw drive. Remove the screw drive unit in the same fashion it was installed.
- 3.4 Remove the vent hose from the mixing head and store it with the dust collector.
- 3.5 Remove electric drive assembly and store it in the electric drive stand.
- 3.6 Install snap tight lid and install and secure shield plug.
- 3.7 Proceed with AP&L Work Plan Steps 3.12 & 3.13.



PLANT MANUAL SECTION:

PROCEDURE/WORK PLAN TITLE:

NO:

SPECIAL WORK PLANS

RESIN TRANSFER FROM 2T13

2409 13

ARKANSAS NUCLEAR ONE

PAGE	12	of	15
REVISION	2	DATE	10/15/81
CHANGE	PC-3	DATE	08/11/82

APPENDIX C

Page 1 of 2

VALVE LINEUP FOR 2T13 TRANSFER

2SZ-1	2T13 Outlet to 2P115A	Closed	_____
2SZ-2	2P115A Discharge	Open	_____
2SZ-45	Flush Line to 2FG-4221	Closed	_____
2CV-4212	(2C114)	Closed	_____
2SZ-44	2P115A Recirc. to 2T13	Closed	_____
2SZ-3	2T13 Recirc. Inlet	Closed	_____
2SZ-7	Sluice Water to 2T13 Transfer	Closed	_____
2SZ-8	Sluice Water to 2T13 Transfer	Closed	_____
2SZ-9	Sluice Water to 2T13	Closed	_____
2SZ-41	Sluice Header Isolation	Closed	_____
2SZ-43	2P115A Discharge to Cask	Closed	_____
2SZ-42	2T13 Vent	Open	_____
2SZ-19	Disposable Liner Vent	Closed	_____
2SZ-20	2T13 Vent to GCH	Open	_____
2SZ-21	2T13 Vent to Gas Analyzer	Closed	_____
2SZ-56	2T13 Overflow to DCH	Closed	_____
2SZ-10	2T13 Drain to DCH	Closed	_____
2SZ-51	Sluice Water to 2T13 Overflow	Closed	_____
2SA-98	SA to 2T13	Closed	_____
RT-10	Unit One	Closed	_____
2SZ-4	Resin From DI's	Closed	_____



PLANT MANUAL SECTION:

PROCEDURE/WORK PLAN TITLE:

NO:

SPECIAL WORK PLANS

RESIN TRANSFER FROM 2T13

2409.13

ARKANSAS NUCLEAR ONE

PAGE 13 of 15

REVISION 2 DATE 10/15/81

CHANGE DATE

APPENDIX C

Page 2 of 2

2SZ-5	2P115B Discharge	Closed	_____
2CUC-81	2P109 Inlet to 2FI-2032	Open	_____
2CUC-98	2P109 Outlet 2FI-2032	Closed	_____
2RT-7	Resin Sluice Header Isolation to 2T13	Open	_____
2SZ-6	Sluice Path Isolation to Unit 1	Shut	_____
2SZ-49	Flush Path Isolation to Hose Conn. (Unit 1)	Shut	_____
Portable de-water pump lined up to discharge to Unit One Aux. Bldg. Equipment Drain Tank.			_____
Hose from Train Bay Hooked up at Strainer (with Isolation Valve) Down stream ABD-18 (Unit 1)			_____
ABD-18		Shut	_____
ABD-1		Open	_____
Isolation Valve at Hose Connection		Open	_____

ARKANSAS NUCLEAR ONE

PAGE 14 of 15

REVISION	2	DATE	10/15/81
----------	---	------	----------

CHANGE	DATE
--------	------

