WATERFORD 3 SES
PLANT OPERATING MANUAL

LOUISIANA POWER & LIGHT
MIDDLE SOUTH UTILITIES SYSTEM

POM VOLUME 20
POM SECTION 2

RW-2-210
REVISION 1

SURVEILLANCE PROCEDURE

RADIOACTIVE WASTE SOLIDIFICATION

LP&L W-3 RECORDS

UNCONTROLLED COPY

DO NOT USE IN ANY SAFETY-RELATED TESTING, MAINTENANCE, OR OPERATIONAL ACTIVITY

PORC Meeting No. 84-32

Reviewed: _____
PORC Chairman

Approved: _____ 5/9/84
Plant Manager-Nuclear — Approval Date

_____
Effective Date

WATERFORD 3 SES

PLANT OPERATING MANUAL

CHANGE/REVISION/DELETION REQUEST

Procedure No. RW-2-210 Title Radioactive Waste Solidification

Effective Date _____ (if different from approval date)

Complete A, B, or C

A. Change No. N/A

B. Revision No. 1

C. Deletion N/A

REASON FOR CHANGE, REVISION, OR DELETION

Clarify which vendor procedures and attachments to be used during solidification and dewatering

REQUIRED SIGNATURES

Originator Dennis B. Stevens Date March 16, 1984

Technical Review [signature] Date 3/16/84

4/2/84

SAFETY EVALUATION

Does this change, revision, or deletion:	YES	NO
1. Change the facility as described in the FSAR?	—	✓
2. Change the procedures as described in the FSAR?	—	✓
3. Conduct tests/experiments not described in the FSAR?	—	✓
4. Create a condition or conduct an operation which exceeds, or could result in exceeding, the limits in Technical Specifications?	—	✓

If the answer to any of the above is yes, complete and attach a 10 CFR 50.59 Safety Evaluation checklist.

Safety Evaluation [signature] Date 3/24/84

Group/Dep't. Head Review Laurence L. Simon Date 3/25/84

R.W. Benning 4/26/84

Temporary Approval* _____ Date _____ (NOS)

Temporary Approval* _____ Date _____

QC Review [signature] Date 5-1-84

PORC Review [signature] Date 5-1-84 Meeting No. 84-32

Plant Manager-Nuclear Approval N/A Date N/A

*Temporary approval must be followed by Plant Manager-Nuclear approval within 14 days.

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1.0 PURPOSE

This procedure establishes the implementing instructions to be used with vendor-supplied Process Control Plans (PCP's) and High Integrity Container (HIC) dewatering procedures, and implements the surveillance requirement of Technical Specification Section 4.11.3 for processing of radioactive waste.

2.0 REFERENCES

2.1 FSAR Chapter 16, Technical Specification 3/4.11.3

2.2 FSAR Chapter 16, Technical Specification 3/4.11.3

2.3 HP-1-101, ALARA Program Implementation

2.4 OP-7-006, Solid Waste Management System

2.5 OP-7-005, Resin Waste Management

2.6 PMD-RW-001, Radioactive Waste Management

2.7 Chem-Nuclear Systems, Inc. SD-OP-003, Process Control Plan for CNSI Cement Solidification Unit, Rev. N

2.8 Chem-Nuclear Systems, Inc., FO-OP-23, Bead Dewatering Procedure for CNSI 14-195 or Smaller Liners

2.9 Chem-Nuclear Systems, Inc., DM-OP-13, Dewatering Bead Resin in Plastic Liners

2.10 Hittman Nuclear Development Corp., STD-P-05-003, Process Control Program for Incontainer Solidification of 10 to 14 Weight Percent Boric Acid, Rev. 1

2.11 Hittman Nuclear Development Corp., STD-P-05-004, Process Control Program for Incontainer Solidification of Bead Resin, Rev. 1

2.12 Hittman Nuclear Development Corp., STD-P-03-005, Dewatering Hittman Radlock Containers with Flexible Underdrains to Less Than 1% Drainable Liquid, Rev. 2

2.13 Hittman Nuclear Development Corp., STD-P-04-002, Dewatering Ion Exchange Resin and Activated Charcoal Filter Media to 0.5%

2.14 RW-2-320, Radioactive Waste Inventory and Material Control

2.15 UNT-5-002, Condition Identification and Work Authorization

2.16 HP-1-110, Radiation Work Permits

2.17 NUS Process Services, SS-005, Process Control Program for Solidification, System Number 2

2.18 NUS Process Services, SS-004, NUHIC-120D, Dewatering Procedure

2.19 NUS Process Services, FI-011, Standard Procedure for Dewatering NUSPSC Resin Liner

3.0 PREREQUISITES

3.1 A CIWA has been processed in accordance with UNT-5-002, Reference 2.15.

3.2 An RWP has been issued for the waste processing activities in accordance with HP-1-110, Reference 2.16.

3.3 Applicable vendor equipment and personnel are available.

3.4 As appropriate, an ALARA prejob briefing session has been conducted with applicable personnel in accordance with HP-1-101, Reference 2.3.

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Contamination control devices shall be installed on temporary hose or line fittings.

4.2 Disposal liner level indication devices shall have satisfactorily passed preoperational checks.

4.3 Maximum allowable liner weight limits have been determined and shall not be exceeded.

4.4 If required, any modification to this procedure shall be performed in accordance with Reference 2.2.

4.5 Protective coverings shall be placed on the process shield and trailer.

5.0 INITIAL CONDITIONS

5.1 For resin disposal, the Spent Resin Transfer System is available for operation per OP-7-005, Reference 2.5.

5.2 For waste concentrator disposal, the Solid Waste Management System is available for operation per OP-7-006, Reference 2.4.

6.0 MATERIAL AND TEST EQUIPMENT

6.1 When using the Chem-Nuclear Systems Inc. (CNSI) Mobile Cement Solidification System, obtain the material and test equipment as required in Reference 2.7.

6.2 When dewatering the CNSI disparable liners or HIC's, obtain the material and test equipment as required in Reference 2.8 or 2.9, as applicable.

6.3 When using the Hittman Nuclear Development Corporation (HWDC) Incontainer Solidification System, obtain the material and test equipment as required in Reference 2.10 or 2.11, as applicable.

6.4 When dewatering the HNDC disposable liners or HIC's, obtain the material and test equipment as required in Reference 2.12 or 2.13, as applicable.

6.5 When using the NUS Process Services Process Control Program, obtain the material and test equipment as required in Reference 2.17.

6.6 When dewatering the NUS Process Services disposable liners or HIC's, obtain the material and test equipment as required in Reference 2.18 or 2.19, as applicable.

7.0 ACCEPTANCE CRITERIA

7.1 SOLIDIFIED WASTE

7.1.1 Product resists puncture

7.1.2 No visible free-standing fluids

7.2 DEWATERING RESIN (HIC)

7.2.1 CNSI - Less than 2000 ml pumped during final dewatering

7.2.2 HNDC - Literal compliance with Reference 2.12 or 2.13, as applicable

7.2.3 NUS Process Services - Literal compliance with Reference 2.18 or 2.19, as applicable

7.3 RADIATION LEVELS

7.3.1 <150 mR/hr on the surface of the process shield

7.3.2 <8 mR/hr at 6 feet from the surface of the process shield

8.0 PROCEDURE

8.1 RESIN SOLIDIFICATION

8.1.1 When using the CNSI Mobile Cement Solidification System (MCSS), connect the Parker noncollapsible hoses from the 2-inch resin outlet flange and from the 1-1/2-inch dewatering inlet flange to the CNSI-MCSS plant connection stand.

8.1.2 When using the HNDC Incontainer Cement Solidification System, connect the noncollapsible hoses from the 2-inch resin outlet flange and from the 1-1/2-inch dewatering inlet flange to the fill-divert valve.

8.1.3 When using the NUS Process Services Mobile Radwaste Solidification System, connect the noncollapsible hoses from the 2-inch resin outlet flange and from the 1-1/2-inch dewatering inlet flange to the process piping skid.

8.1.4 Determine if a test solidification is required by reviewing the Radwaste Solidificication Log (Attachment 10.1).

> NOTE
> Technical Specifications References 2.1 and 2.2 require that a test solidification from each batch of waste be performed at least once every ten solidifications. If not required, proceed to step 8.1.9.

8.1.5 Place the Spent Resin Transfer System (SRTS) in recirculation in accordance with OP-7-005, Reference 2.5, and recirculate for a minimum of 45 minutes.

> CAUTION
> Notify Health Physics for appropriate surveys prior to recirculation of the SRTS.

8.1.6 Obtain the resin sample for a test solidification as required by Reference 2.7, 2.11 or 2.17, as applicable.

8.1.7 Secure the SRTS in accordance with OP-7-005, Reference 2.5.

8.1.8 Using the sample obtained in step 8.1.5, perform the test solidification in accordance with Reference 2.7, 2.11 or 2.17. The vendor operator will record results on the appropriate form(s). Radwaste personnel will record the results in the Radwaste Solidification Log (Attachment 10.1). Ensure that the test results meet the Acceptance Criteria of section 7.1. If the Acceptance Criteria are not met, proceed to section 8.4.

8.1.9 The vendor solidification operator will calculate the amount of resin, cement, water, and other reagents required for solidification by completing the appropriate form.

> NOTE
> Assign a liner number in accordance with RW-2-320, Reference 2.14, and record on Attachment 10.1.

8.1.10 The Radwaste Supervisor will review the results of steps 8.1.8 and 8.1.9 prior to solidification.

8.1.11 Place the SRTS in recirculation in accordance with OP-7-005, Reference 2.5. Recirculate for a minimum of 45 minutes.

> CAUTION
> Notify Health Physics for appropriate surveys prior to recirculation of the SRTS.

8.1.12 Transfer resin to the liner in accordance with OP-7-005, Reference 2.5, until the predetermined amount of resin slurry has been transferred. Secure the SRTS.

> CAUTION
> Notify Health Physics for appropriate surveys during transfer to ensure the Acceptance Criteria of section 7.3 are not exceeded. If the Acceptance Criteria of 7.3 are exceeded, stop the solidification process and proceed to section 8.4.

> NOTE
> Dewatering may commence at the same time as resin transfer.

8.1.13 Dewater the liner in accordance with Reference 2.7, 2.11 or 2.17.

8.1.14 Repeat steps 8.1.11, 8.1.12 and 8.1.13 until the predetermined amount of resin has been transferred and dewatered.

8.1.15 Secure the SRTS in accordance with Reference 2.5.

8.1.16 Solidify resin in accordance with Reference 2.7, 2.11 or 2.17, as applicable. Radwaste personnel will enter the results in the Radwaste Solidification Log (Attachment 10.1). The vendor operator will record the results on the appropriate form(s).

8.1.17 Remove the solidification equipment. The Acceptance Criteria of section 7.1 shall be verified by the Plant Quality Group and recorded on Attachment 10.1. If the Acceptance Criteria are not met, proceed to section 8.4.

8.1.18 Remove the protective coverings from the process shield and the trailer. Health Physics will verify that the smearable contamination on the external surface of the shield is less than 1000 dpm/100 cm^2. If not, decontaminate and resurvey as necessary.

8.1.19 Remove the process liner and store as directed by the Radwaste Supervisor.

8.1.20 The Radwaste Supervisor will review the vendor's solidification results and the Radwaste Solidification Log (Attachment 10.1).

8.2 WASTE CONCENTRATES SOLIDIFICATION

8.2.1 When using the CNSI-MCSS, connect the Parker noncollapsible hoses from the 1-inch waste concentrate outlet flange to the CNSI-MCSS plant connection stand.

8.2.2 When using the HNDC Incontainer Cement Solidification System, connect the noncallapsible hose from the 1-inch waste concentrate outlet flange to the fill-divert valve.

8.2.3 When using the NUS Process Services Mobile Cement Solidification System, connect the noncollapsible hose from the 1-inch waste concentrate outlet flange to the process piping skid.

8.2.4 Determine if a test solidification is required by reviewing the Radwaste Solidification Log (Attachment 10.1).

> **NOTE**
>
> Technical Specifications References 2.1 and 2.2 require that a test solidification from each batch of waste be performed at least once every ten solidifications. If not required, proceed to step 8.2.9.

8.2.5 Recirculate the Waste Concentrate Tank in accordance with OP-7-006, Reference 2.4, for the number of tank volumes required by Reference 2.7, 2.10 or 2.17, as applicable.

> **CAUTION**
>
> Notify Health Physics for appropriate surveys prior to recirculation of the Waste Concentrate Tank.

8.2.6 Obtain a waste concentrate sample for a test solidification as required by Reference 2.7, 2.10 or 2.17.

8.2.7 Secure the SRTS in accordance with OP-7-006, Reference 2.4.

8.2.8 Using the sample obtained in step 8.2.6, perform the test solidification in accordance with Reference 2.7, 2.10 or 2.17. The vendor operator will record the results on the appropriate form(s). Radwaste personnel will record the results in the Radwaste Solidification Log (Attachment 10.1). Ensure that the test results meet the Acceptance Criteria of section 7.1. If the Acceptance Criteria are not met, proceed to section 8.4.

8.2.9 The vendor solidification operator will calculate the amount of waste, cement, and other reagents required to perform solidification by completing the appropriate forms in accordance with Reference 2.7, 2.10 or 2.17, as applicable.

> NOTE
> Assign a liner number in accordance with RW-2-320, Reference 2.14, and record on Attachment 10.1.

8.2.10 The Radwaste Supervisor will review the results in steps 8.2.8 and 8.2.9 prior to solidification.

8.2.11 Recirculate the Waste Concentrate Tank in accordance with OP-7-006, Reference 2.4, for the number of tank volumes required by Reference 2.7, 2.10 or 2.17, as applicable.

> CAUTION
> Notify Health Physics for appropriate surveys prior to recirculation of the Waste Concentrate Tank.

8.2.12 Transfer waste to liner in accordance with OP-7-006, Reference 2.4, until the desired amount of waste has been transferred. Secure waste concentrate transfer.

> NOTE
>
> Notify Health Physics for appropriate surveys during transfer to ensure the Acceptance Criteria of section 7.3 are not exceeded. If the Acceptance Criteria of 7.3 are exceeded, stop the solidification process and proceed to section 8.4.

8.2.13 Solidify waste in accordance with Reference 2.7, 2.10 or 2.17, as applicable. Radwaste personnel will enter the results in the Radwaste Solidification Log (Attachment 10.1). The vendor operator will record the results on the appropriate form(s).

8.2.14 Remove the solidification equipment. The Acceptance Criteria of section 7.1 shall be verified by the Plant Quality Group and recorded on Attachment 10.1. If the Acceptance Criteria are not met, proceed to section 8.4.

8.2.15 Remove the protective coverings from the shield and the trailer. Health Physics will verify that the smearable contamination on the external surface of the shield is less than 1000 dpm/100 cm^2. If not, decontaminate and resurvey as necessary.

8.2.16 Remove the process liner and store as directed by the Radwaste Supervisor.

8.2.17 The Radwaste Supervisor will review the vendor's solidification results and the Radwaste Solidification Log (Attachment 10.1).

8.3 RESIN DEWATERING

8.3.1 When using the CNSI Mobile Cement Soldification System (MCSS), connect the Parker noncollapsible hoses from the 2-inch resin outlet flange and from the 1-1/2-inch dewatering inlet flange to the CNSI-MCSS plant connection stand.

8.3.2 When using the HNDC Incontainer Cement Solidification System, connect the noncollapsible hoses from the 2-inch resin outlet flange and from the 1-1/2-inch dewatering inlet flange to the fill-divert valve.

8.3.3 When using the NUS Process Services Mobile Solidification System, connect the noncollapsible hoses from the 2-inch resin outlet flange and from the 1-1/2-inch dewatering inlet flange to the process piping skid.

8.3.4 Place Spent Resin Transfer System (SRTS) in recirculation in accordance with Reference 2.5. Recirculate for 45 minutes.

> CAUTION
> Notify Health Physics for appropriate surveys during recirculation of the SRTS.

8.3.5 Transfer resin to the High Integrity Container (HIC) or liner as appropriate in accordance with OP-7-005, Reference 2.5.

> CAUTION
> Notify Health Physics for appropriate surveys during transfer to ensure the Acceptance Criteria of section 7.3 are not exceeded. If the Acceptance Criteria of 7.3 are exceeded, stop the transfer and proceed to section 8.4.

8.3.6 Commence dewatering the HIC or liner in accordance with Reference 2.8, 2.9, 2.12, 2.13, 2.18 or 2.19, as applicable.

8.3.7 When the predetermined amount of resin has been transferred, secure the SRTS in accordance with OP-7-005, Reference 2.5.

8.3.8 Complete resin dewatering in accordance with Reference 2.8, 2.9, 2.12, 2.13, 2.18 or 2.19, as applicable. The vendor operator will complete the applicable dewatering process form(s).

8.3.9 The applicable Acceptance Criteria of section 7.2 shall be verified by the Plant Quality Group and recorded on Attachment 10.2. If the Acceptance Criteria are not met, proceed to section 8.4.2.

8.3.10 Radwaste personnel will enter dewatering results in the Resin Dewatering Log, Attachment 10.2.

> NOTE
> Assign a liner number in accordance with Reference 2.14.

8.3.11 Remove dewatering equipment and seal the HIC or liner as applicable.

8.3.12 Remove the protective coverings from the shield and the trailer. Health Physics will verify that the smearable contamination on the external surface of the shield is less than 1000 dpm/100 cm^2. If not, decontaminate and resurvey as necessary.

8.3.13 Store the HIC or liner as directed by the Radwaste Supervisor.

8.3.14 The Radwaste Supervisor will review the vendor's dewatering results and the Resin Dewatering Log (Attachment 10.2).

8.4 UNACCEPTABLE CONDITIONS

8.4.1 Test Solidification

8.4.1.1 Obtain additional test samples in accordance with step 8.1.5 or 8.2.5, as applicable.

8.4.1.2 Perform the test solidificiation in accordance with step 8.1.7 or 8.2.7, as applicable, with alternative parameters allowed by the vendor's Process Control Plan.

8.4.1.3 If the subsequent test solidification is acceptable, solidification of the batch of waste may then be resumed using the alternative solidification parameters determined in step 8.4.1.2.

8.4.1.4 When the initial test solidification from a batch of waste is unacceptable, test solidifications shall be performed for each consecutive batch of the same type of wet waste until at least three (3) consecutive test solidifications are acceptable. If three consecutive acceptable test solidifications are not achieved, notify the Radwaste Supervisor.

8.4.2 Dewatering and Solidification Process

8.4.2.1 Record the unacceptable condition on the appropriate form.

8.4.2.2 Inform the Radwaste Supervisor of the unacceptable condition.

8.4.2.3 Correct the unacceptable condition in accordance with the appropriate Process Control Plan.

8.4.3 Radiation Levels

8.4.3.1 Transfer the contents from the unacceptable liner to another liner in accordance with the appropriate Process Control Plan.

8.4.3.2 Inform the Radwaste Engineer of the unacceptable condition.

9.0 SETPOINTS

NONE

10.0 ATTACHMENTS

10.1 Radwaste Solidification Log

10.2 Resin Dewatering Log

11.0 COMMITMENTS AND REFERENCES

R TYPE
RI.32

RADWASTE SOLIDIFICATION LOG

TEST SOLIDIFICATION

DATE	SYSTEM COMPONENT	TYPE WASTE	RESULTS		VENDOR PCP	COMMENTS
			LIQUID MI	SET		

LINER SOLIDIFICATION

SOLID NO.	DATE	LINER NO.	TYPE WASTE	RESULTS					VENDOR PCP
				LIQUID MI	RESISTS PUNCTURE	SAT/UNSAT	QUALITY GROUP	DATE	
1									
2									
3									
4									
5									
6									
7									
8									
9									

RESIN DEWATERING LOG

R TYPE
RI.33

DATE	SYSTEM COMPONENT	LINER NO.	RESULTS				VENDOR PCP
			LIQUID MI	SAT/UNSAT	QUALITY GROUP	DATE	

LOUISIANA POWER & LIGHT CO.

WATERFORD 3

MISSING INFORMATION LIST

PROCEDURE NO. RW-2-210 PROCEDURE TITLE: Radioactive Waste Solidification

Revision No. 1

ITEM NO.	ITEM	AFFECTED PARAGRAPH	CLEARED DATE	CLEARED INITIAL
1	Recirculation of Waste Concentrate Tk	8.2.4, 8.2.9	4.16	[illegible]

ALL MISSING INFORMATION ON THIS LIST HAS BEEN CLEARED

Dennis B. Stevens
ASSIGNED AUTHOR