



TMI-1 Maintenance and
Construction Department

Installation
Procedure No.

Installation Procedure Title:

Removal of Remnant of Partially Inserted
Plug From Row-Tube A-143-61

A25K-51512-IP3

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<u>PAGE</u>	<u>REV.</u>	<u>EFFECTIVE DATE</u>	<u>EXHIBIT</u>	<u>PAGE</u>	<u>REV.</u>	<u>EFFECTIVE DATE</u>
1.0	0	02/24/83				
2.0	0	02/24/83				
3.0	0	02/24/83				
4.0	0	02/24/83				
5.0	0	02/24/83				

NO ATTACHMENTS

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Page / Sheet 1 OF 5
WA # A25K-51512

	SIGNATURE	TITLE/DIVISION/DEPARTMENT	DATE
Originator	<i>G. Kull</i>	Job Planner	2/24/83
Concurrence	<i>D. W. Cauterwick</i>	Technical Support	3-14-83
Reviewed By	<i>J. Tropper</i>	Responsible Technical Reviewer	3/1/83
	<i>Michael V. Brown</i>	Plant Review Group	3/14/83
	<i>W. J. (W.) Thuniger</i>	Rad Con	3/1/83
	<i>T. A. Baskley</i>	ISR (Independent Safety Reviewer)	3/14/83
		8506140216 850125 PDR FOIA DETJEN84-897 PDR	
Approved By	<i>J. J. [Signature]</i>	P&S Manager	3/1/83
	<i>[Signature]</i>	O&M Director or N/A	3-15-83
	<i>[Signature]</i>	Mod/Ops ⁸⁴⁷ Manager or N/A	3/15/83

Revision
No. 0 108

FORM A200-ADM-1218.1-1

1.0 INTRODUCTION AND SCOPE

- 1.1 This procedure shall govern the technique for removal of the remnants of an explosive plug in the lower tubesheet of an OTSG.
- 1.2 This procedure shall be used to remove the remnants of an exploded plug in tube A-143-61. This explosive plug detonated while it was falling out of the tube.

2.0 REFERENCES

- 2.1 B&W Technical Document 64-1139698-00, Removing Remnant of Partially Inserted Exploded Plug from LTS.
- 2.2 MNCR 0215-82
- 2.3 AP 1020
- 2.4 AP 1030
- 2.5 DRF 10639 (B&W FCA 3921, Rev. 0) *OK* 3/10/83
- 2.6 DRF 8755 (SE-120012-009, Rev. 0) *OK* 3/14/83

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3.0 RESPONSIBILITIES

- 3.1 M&C Department is responsible for the performance of all aspects of this work.
- 3.2 Plant Engineering shall provide assistance as required.
- 3.3 B&W Personnel will perform the actual plug removal.

4.0 PREREQUISITES

- 4.1 OTSG primary side is drained and upper and lower manway covers are removed.
- 4.2 Adequate lighting is available inside the lower OTSG head and tent and air supply (80 psi @ 48 SCFM min.) available to power the machining tool.
- 4.3 All 110V AC current to tent is on ground fault.

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- 4.4 All tools and materials necessary to remove the plug remnant are available with the tooling assembled and in proper working order. Tools to meet Class C cleanliness.
- 4.5 All necessary training is complete with sufficient manpower available to perform the required functions.
- 4.6 The tube with the exploded plug remnant has been identified.
- 4.7 Work platform installed in "A" OTSG lower head.
- 4.8 ALARA and RWP requirements have been satisfied.
- 4.9 Cold leg plugs installed, inflated and maintained in accordance with current applicable "STP" or J-leg covers installed. Drain plug installed.

5.0 SPECIAL/SAFETY PRECAUTIONS

- 5.1 Exercise extreme care to prevent dropping tools or parts inside the OTSG or piping since such an accident will result in lengthy retrieval operations. Use of nylon lanyards or equivalent means of positive capture is required.
- 5.2 Observe all applicable limits and precautions of the Radiation Protection Plan.
- 5.3 During performance of the liquid penetrant test, every effort is to be made to minimize the amount of liquid penetrant material left in the OTSG. This includes the following:
 - A. Apply the penetrant with a brush instead of spraying.
 - B. Use a template or plastic cover to cover adjacent holes when spraying developer.
 - C. Clean remaining developer and penetrant with approved solvents from all accessible areas.

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- 5.4 All personnel performing the actual work described in this procedure, and related ones, should be thoroughly familiar with the procedures, the handling and operation of all special tools and materials, and all applicable safety precautions.
- 5.5 Detailed handling, placement, operation and manner of use of all special tools and material shall be per the direction of the B&W task leader.
- 5.6 Assure that lower head cold leg covers or plugs and lower dome drain plug are installed prior to any work commencing in the OTSG concerning explosive plug removal.
- 5.7 The tube with the partially inserted plug shall be identified in a manner that will not interfere with the plug removal tooling.
- 5.8 An enclosure shall be provided around the opening to the steam generator (SG) to ensure that any contaminated air is contained. This area shall be free from oil, scale, chips, wire, grease, chemicals and other foreign materials which may be detrimental to the primary system.

6.0 INSTALLATION REQUIREMENTS

- 6.1 Properly identify tube to be worked on.
- 6.2 Center positioning jig over Tube 61 - Row 143.
- 6.3 Drill 29/64" hole completely through remaining section of plug.

NOTE: Be prepared for some water to fall out of tube once center of plug is drilled out. Ensure absorbent material is placed under plug.

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- 6.4 Remove drill assembly.
- 6.5 Tap plug hole with 1/2" -20 tap.
- 6.6 Insert 1/2" -20 drill rod through the drilled hole and position plug puller.
- 6.7 Using explosive plug puller, attempt to remove plug from tube end.
- 6.8 If plug comes out, proceed to Step 6.14.
- 6.9 If plug cannot be removed by using the plug removal puller, remove the plug puller.
- 6.10 Replace 29/64" drill bit with 33/64" drill bit.
- 6.11 Install drill assembly and drill 33/64" hole completely through remaining section of plug.
- 6.12 Replace 33/64" drill bit with 14mm (.5512") drill bit.
- 6.13 Drill 14mm hole completely through remaining section of plug.
- 6.14 Remove plug removal equipment from OTSG head.
- 6.15 Remove any remaining pieces of the explosive plug. Ensure explosive plug retaining sleeve is removed from the tube.
- 6.16 Insert honing tool and clean I.D. of tube to accept an explosive plug.
- 6.17 Perform PT of tube and tube to tubesheet weld in accordance with site approved procedures to assure that the tube still provides a leak tight boundary. Acceptance criteria shall be no linear indications. Q.C. shall perform visual inspection of first 2" of tube I.D. to insure that no remarkable damage was caused by the drill bit.
- 6.18 Refer to Explosive Plugging Procedure for further instructions.

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GENERAL PUBLIC UTILITIES
OTSG REPAIRS

DATE 3/16/83

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>RESPONSIBILITY</u>	<u>DATE REQUIRED</u>
1.	Round Robin Samples-NWT Lab <ul style="list-style-type: none"> . Spent Fuel . BWST . Decay Heat - Monthly Samples . Ship Next Monthly Samples 	J. Colitz	End of Month 3/31
2.	Restoration Secondary Side A. Temp. Chem. System		
3.	Ops OTSG Status <ul style="list-style-type: none"> . A and B OTSG Full Wet Layup . Receive Backing Plates for "A" Upper Manway 		2/7 4/1
4.	Post Expansion <ul style="list-style-type: none"> . Felt Plug Blowing Device-Store at Reactor Bldg . Final Freepath - Blow Plugs from Top . B&W Equipment . B&W Proposal MT Vernon Test 		TBD 3/27
5.	Immunol Flush System <ul style="list-style-type: none"> . Receive Vyton Tubing . Revised Spec for Flushing 	T. Functions	TBD TBD
6.	Tube Plug Stabilization <ul style="list-style-type: none"> . Spec for Plugging Final Rev 9 Issue . Resolve Plug Pulling Process . M&C Procedure Requirements QA IP1 Rev. 1 Stabilizer Endmilling QA IP2 Rev. 0 Remove Old Stabilizers QA IP3 Rev. 0 Removal of Remnant. QA IP4 Rev. 0 Remove W Roll Plugs QA IP5 Rev. 0 Tapered Plug Removal QA IP6 Rev. 1 Stabilization and Plugging ENGR IP7 Rev. 0 Jump Pack Assembly IP8 Rev. 0 Exp. Plugging, Lower Hd. . Receive Eddy Current Templates . Explosive Plugs On-site Monday 	C. K. Lee Westinghouse G. Kull G. Kull G. Kull G. Kull G. Kull G. Kull G. Kull	3/15 TBD 3/16 3/16 3/16 3/16 TBD 3/16 TBD 3/18 3/18 3/21

DRF on W plug

6 stabilizers in the A OTSG

Lower Tube sheet

-2-
OTSG REPAIRS

DATE 3/16/83

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>RESPONSIBILITY</u>	<u>DATE REQUIRED</u>
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7. Miscellaneous Items to Resolve
 . Hydrogen Peroxide Tube Soak

8. Waiting Documentation
 MNCR

Responsibility

215-82	Plug Exploded at Wrong Area of Tube	B&W
345-82	2 Tubes Plugged Incorrectly	
354-82	Documentation for Immunol-1st Batch	Eng
426-82	Wire Brush B6-1	
009-83	Immunol at Cold Legs	
041-83	Tube Ends	Eng.

9. Tube Endmilling
 . Complete 5 Tubes on "A" *done*

10. Rad Con Exposure Data (Based on SRDs) as of 3/14
 . Total OTSG Exposure since 1st Blast - 678.8 Man Rem
 . Total OTSG Exposure since Nov 1981 - 855.0 Man Rem

11. Bubble and Drip Test
 Draft Detailed Spec .
 Final
 Cleaning of the Cold Legs
 approx 4100
 Hand roll
- T. Reichter 3/18
 3/25

12. Anticipated Jumps
- | | | |
|-------------|--|-----------------------|
| <u>Date</u> | <u>Description</u> | <u>Responsibility</u> |
| 3/16 | A - Upper - <i>stabilization</i>
A - Lower - | Levin/Catalytic |
| 3/16 | B - Upper - <i>NONE (MARKERS) back shifts</i>
B - Lower - | |

*1000 sulfur program
 100 Hydrogen peroxide*

GENERAL PUBLIC UTILITIES
OTSG REPAIRS

DATE 3/17/83

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>RESPONSIBILITY</u>	<u>DATE REQUIRED</u>
1.	Round Robin Samples-NWT Lab	J. Colitz	
	. Spent Fuel		
	. BWST		
	. Decay Heat - Monthly Samples		End of Month
	. Ship Next Monthly Samples		3/31
2.	Restoration Secondary Side		
	A. Temp. Chem. System		
3.	Ops OTSG Status		
	. A and B OTSG Full Wet Layup		2/7
	. Receive Backing Plates for "A" Upper Manway		4/1
4.	Post Expansion		
	. Felt Plug Blowing Device-Store at Reactor Bldg		
	. Final Freepath - Blow Plugs from Top		TBD
	. B&W Equipment		3/27
	. B&W Proposal		
	. Mt. Vernon Test <i>will not be before Wednesday</i>		
	. Technique for Marking Plugs		
5.	Immunol Flush System		
	. Revised Spec for Flushing	T. Functions	TBD
6.	Tube Plug Stabilization		
	. Spec for Plugging Final		
	Rev 9 Issue	C. K. Lee	3/15
	. Resolve Plug Pulling Process	Westinghouse	TBD
	. M&C Procedure Requirements		
	IP1 Rev. 1 Stabilizer Endmilling	G. Kull	3/16
	IP2 Rev. 0 Remove Old Stabilizers	G. Kull	3/16
	IP3 Rev. 0 Removal of Remnant	G. Kull	3/16
	IP4 Rev. 0 Remove W Roll Plugs	G. Kull	TBD
	IP5 Rev. 0 Tapered Plug Removal	G. Kull	TBD
	<i>Sealed</i> IP6 Rev. 1 Stabilization and Plugging	G. Kull	3/16
	IP7 Rev. 0 Jump Pack Assembly	G. Kull	3/18
	IP8 Rev. 0 Exp. Plugging, Lower Hd.	G. Kull	3/18
	. Receive Eddy Current Templates		3/18
	. Explosive Plugs On-site		3/21

DRF

DRF for W Plugs

100°F / 50°F

Ue 3m

16

22

44 done

E Templates mark the tubes

-2-
OTSG REPAIRS

DATE 3/17/83
DATE
REQUIRED

ITEM DESCRIPTION

RESPONSIBILITY DATE
REQUIRED

7. Miscellaneous Items to Resolve
 . Hydrogen Peroxide Tube Soak

*Memo
Safety evaluation issued yesterday*

8. Waiting Documentation
 MNCR

Responsibility

215-82 Plug Exploded at Wrong Area of Tube
345-82 2 Tubes Plugged Incorrectly
354-82 Documentation for Immunol-1st Batch
426-82 Wire Brush B6-1
009-83 Immunol at Cold Legs
041-83 Tube Ends

B&W

Eng

Eng.

9. Tube Endmilling

photographs

10. Rad Con Exposure Data (Based on SRDs) as of 3/16
 . Total OTSG Exposure since 1st Blast - 678.8 Man Rem
 . Total OTSG Exposure since Nov 1981 - 855.0 Man Rem
 Estimate 275rem

11. Bubble and Drip Test
 Draft Detailed Spec
 Final

T. Reichter

3/18

3/25

$$\frac{(2700 - x) \times \frac{2}{3}}{17 \text{ m/hr}} = \text{stay time}$$

12. Cleaning of the Cold Legs

*Chemistry
Shutdown line*

13. Anticipated Jumps
 Date Description

Responsibility

3/17 A - Upper -
 A - Lower -

Levin/Catalytic

3/17 B - Upper -
 B - Lower -

*Hydroxide Peroxide
Chemistry support*

GENERAL PUBLIC UTILITIES
OTSG REPAIRS

DATE 3/18/83

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>RESPONSIBILITY</u>	<u>DATE REQUIRED</u>
1.	Round Robin Samples-NWT Lab <ul style="list-style-type: none"> . Spent Fuel <i>welds</i> . BWST . Decay Heat - Monthly Samples . Ship Next Monthly Samples 	J. Colitz	End of Month 3/31
2.	Restoration Secondary Side A. Temp. Chem. System		
3.	Ops OTSG Status <ul style="list-style-type: none"> . A and B OTSG Full Wet Layup . Receive Backing Plates for "A" Upper Manway 		2/7 4/1
4.	Post Expansion <ul style="list-style-type: none"> . Felt Plug Blowing Device-Store at Reactor Bldg . Final Freepath - Blow Plugs from Top . B&W Equipment . B&W Proposal . Mt. Vernon Test . Technique for Marking Plugs 		TBD 3/27 3/23
5.	Immunol Flush System <ul style="list-style-type: none"> . Revised Spec for Flushing 	T. Functions	TBD
6.	Tube Plug Stabilization <ul style="list-style-type: none"> . Resolve Plug Pulling Process . M&C Procedure Requirements . IP4 Rev. 0 Remove W Roll Plugs . IP5 Rev. 0 Tapered Plug Removal . IP6 Rev. 2 Stabilization and Plugging . IP7 Rev. 0 Jump Pack Assembly . IP8 Rev. 0 Exp. Plugging, Lower Hd. . Receive Eddy Current Templates . Explosive Plugs On-site <i>Monday 0700</i> 	Westinghouse G. Kull G. Kull G. Kull G. Kull G. Kull	TBD TBD TBD 3/18 3/18 3/21

West Procedure

out

ORE

A 87

List for plug

W 105 B
281 A

*put two in the burner
hole*

-2-
OTSG REPAIRS

DATE 3/18/83
DATE
REQUIRED

ITEM DESCRIPTION

RESPONSIBILITY DATE
REQUIRED

7. Miscellaneous Items to Resolve
 . Hydrogen Peroxide Tube Soak

Safety Evaluation

8. Waiting Documentation
 MNCR

Responsibility

- | | | |
|----------|-------------------------------------|------|
| → 215-82 | Plug Exploded at Wrong Area of Tube | B&W |
| → 345-82 | 2 Tubes Plugged Incorrectly | |
| 354-82 | Documentation for Immunol-1st Batch | Eng |
| 426-82 | Wire Brush B6-1 | |
| 009-83 | Immunol at Cold Legs | |
| → 041-83 | Tube Ends | Eng. |

9. Tube Endmilling
 photographs

10. Rad Con Exposure Data (Based on SRDs) as of 3/16-17
- | | | |
|---|---------|-----|
| . Total OTSG Exposure since 1st Blast - 687.2 | Man Rem | 692 |
| . Total OTSG Exposure since Nov 1981 - 863.4 | Man Rem | 868 |

11. Bubble and Drip Test
 Draft Detailed Spec
 Final

T. Reichter 3/18
 3/25

12. Cleaning of the Cold Legs

13. Anticipated Jumps
 Date Description

Responsibility

- | | | |
|------|-------------------------|-----------------|
| 3/18 | A - Upper - <i>stab</i> | Levin/Catalytic |
| | A - Lower - | |
| 3/18 | B - Upper - <i>stab</i> | |
| | B - Lower - | |

West on Monday / start of on Thursday

*Drip
Felt plug
clean cold legs
Bubble Test
may H₂ Peroxide*