		PROCEDURE CHANGE	FORM		
	DATE 06/03/10 PREPARER	Dean Lystad	EXT. 5985		
		(PRINT NAME)	WO#		
	THE THEAT EXONANGE TABLE HASS	ing .			
S	CHANGED PAGE NO(s). 2, 2.1, 3,	3.1, 9,and 14			
E C					
T	<b>m</b>		change limit of brush use to no more than		
i			art in Attachment 10.1 showing acceptable 004394. See record of changes for details.		
0	plugging methodology. Reference Cr	1-2010-003032 and CR-2010-0	104334. See record of changes for details.		
N	PREPARER (Signature/Date)	Dean Lintal	06/03/10		
	PREPARER (Signature/Date) If change is editorial, THEN circle or	mark "YES".	YES		
l	Editorial changes, as limited by STA-		quire Technical Review, NSR or		
	50.59 Review.	-L. Fillomath I Ru	4.1.1 Gillmont		
	TECHNICAL REVIEWER: Bever	(Printed Name a	nd Signature)		
1	Date: 6 3 10		EXT. 0870		
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Ţ	QUALIFIED REVIEWER:	(Printed Name a	nd Signatura)		
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	QC	Yes	RPS 6.7.10		
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	APPROVED BY: (Signatur	re) (Print name it not approval authority and	change is editorial)		
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ı			Page 1 of 1 R-0		

# STA-202-7 Ktachmont for MSM-GO-5870-RO-8 266-3-10

(For Information Only)

## Record of Changes

Page 1

Rev/PCN	Affected Pages	Description of Change
0/4	2, 2.1, 3, 14	Added components CP1/2-COCNMC-01/02 and CP1/2-GSCNGS-01/02 as non-ASME components to be included under the tube plugging methodology. Edited tube plugging methodology table to include all heat exchangers listed in procedure. These components are new to the Heat Exchanger Program. Ref. CR-2009-005819.
0/5	14.2	Corrected tag numbers of feedwater heaters. Added that drawing provides fabrication detail and added dimensions to drawing of tube plug.
0/6	5	Step 8.4 - correct tag number for feedwater heaters in directional statement.
	13	Attachment 10.2 - corrected title
	14.1	Added tag numbers to title of attachment. Step 3 added new step to measure ID of hole for tube to be plugged and instruction to fabricate plug per page 2 of Attachment 10.2.
	14.2	Changed plug projection minimum from 3/16" to 1/8".
0/7	14	Added driven plugs as an option for plugging Aux. Gland Steam Condenser and Main Gland Steam Condensers. Added location numbers for high pressure FW heaters, and added more complete description of heaters/heat exchangers/condensers in table.
0/8	2	Step 1.0 - added external drain cooler location numbers. Step 3.2 - added definition for Pop-a-plug.
	2.1	Added Reference 4.10 & 4.18.
	3	Step 5.2 clarified. Step 5.3 - clarified tag numbers as being Section VIII rather than Non- ASME and added external drain cooler location numbers
	3.1	Step 7.1 - added tube cleaning brushes
	9	Step 8.5.2.7, preceding note and substeps - changed brush replacement recommendation from 10 uses to 50 (max) uses. Added detail on brush use and replacement.
	14	Attachment 10.1 - Added external drain coolers and note with location numbers for external drain coolers.

		PROCEDURE CHANGE	FORM		
	DATE 04/20/10 PREPARER	Dean Lystad	EXT. 5985		
	PCN MSM-G0-5870-R0-7	(PRINT NAME) /OTPCN	WO#		
	TITLE Heat Exchanger Tube Pluggi				
Q					
S E	CHANGED PAGE NO(s). 14	**************************************			
C	CHANGE JUSTIFICATION To add	ontion of using driven plugs in	Aux Gland Steam Condenser and Main		
T			component to Attachment 10.1. See record		
0	of changes for details.				
N					
1	PREPARER (Signature/Date)	Done Lital	04/20/10		
1	PREPARER (Signature/Date)  If change is editorial, THEN circle or r		YES		
	Editorial changes, as limited by STA-2	202, Attachment 8.F, do not re-	quire Technical Review, NSR or		
	50.59 Review. TECHNICAL REVIEWER: BOVE	rlu Gilhreath Ruse	1. Gilbroath		
I	TECHNICAL REVIEWER: BOVER	(Printed Name a	signature) EXT. OR 70		
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s	PROC If the change does not change the inf	CEDURE CHANGE INTERIM A tent of the procedure and the ch	APPROVAL hande must be incorporated immediately		
E	If the change does not change the intent of the procedure and the change must be incorporated immediately, then complete this section; otherwise, route in accordance with Section III for review and approval.				
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	SHIFT MANAGER or UNIT SUPERVI		nd Signature)  EXT		
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	- (Signature	e) (Print name if not approval authority and o	change is editorial)  STA-202-7		
			Page 1 of 1		
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# 57A-202-7 Attachment for MSM-GO. 5870-RO-7 Df 4-20-10

(For Information Only)

## Record of Changes

Page 1

Rev/PCN	Affected Pages	Description of Change
0/2	3, 3.1, 4, 7, 12	Changed verification holdpoint to be in compliance with STA-694, added clarification to welding instructions and separated instructions for ASME and Non-ASME components as some of the components covered in this procedure no longer fall under the jurisdiction of ASME Section VIII, XI or III per System Engineer.
0/3	3	Added Step 5.5 to ensure Weld Data Record in included if needed.
	5	Added directional statement for installing welded tube plugs in inaccessible locations.
	13	Added Attachment 10.2 to list of attachments.
	14.1 & 14.2	Added instruction for installing welded tube plugs in locations inaccessible to drilling and rolling activities. Ref. WO 366884. Added information on typical alternate weld details performed on H.P. Feedwater Heaters.
0/4	2, 2.1, 3, 14	Added components CP1/2-COCNMC-01/02 and CP1/2-GSCNGS-01/02 as non-ASME components to be included under the tube plugging methodology. Edited tube plugging methodology table to include all heat exchangers listed in procedure. These components are new to the Heat Exchanger Program. Ref. CR-2009-005819.
0/5	14.2	Corrected tag numbers of feedwater heaters. Added that drawing provides fabrication detail and added dimensions to drawing of tube plug.
0/6	5	Step 8.4 - correct tag number for feedwater heaters in directional statement.
	13	Attachment 10.2 - corrected title
	14.1	Added tag numbers to title of attachment. Step 3 added new step to measure ID of hole for tube to be plugged and instruction to fabricate plug per page 2 of Attachment 10.2.
	14.2	Changed plug projection minimum from 3/16" to 1/8".
0/7	14	Added driven plugs as an option for plugging Aux. Gland Steam Condenser and Main Gland Steam Condensers. Added location numbers for high pressure FW heaters, and added more complete description of heaters/heat exchangers/condensers in table.

DATE 04/15/10 PREPARER Dean Lystad EXT  PCN MSM-G0-5870-R0-6 /OTPCN WO#  TITLE Heat Exchanger Tube Plugging  CHANGED PAGE NO(s). 5, 13, 14.1 and 14.2  CHANGE JUSTIFICATION To add location numbers to Attachment 10.2 title and Step 8.4. Cominimum projection distance from tube sheet in Attachment 10.2 drawing to match text. See rechanges for details.  PREPARER (Signature/Date) Dean Again Office of Mark "YES".  Editorial changes, as limited by STA-202, Attachment 8.F, do not require Technical Review, No 50.59 Review.  TECHNICAL REVIEWER: Bevery Gilbrath Rully Gilbrath  Date: 4-15-10 EXT.	corrected plug ecord of 5/10 YES SR or
PCN_MSM-G0-5870-R0-6 /OTPCNWO#	corrected plug ecord of 5/10 YES SR or
S CHANGED PAGE NO(s). 5, 13, 14.1 and 14.2  C CHANGE JUSTIFICATION To add location numbers to Attachment 10.2 title and Step 8.4. C minimum projection distance from tube sheet in Attachment 10.2 drawing to match text. See rechanges for details.  PREPARER (Signature/Date) Them Again 15 than 16	corrected plug ecord of 5/10 YES SR or
changes for details.  PREPARER (Signature/Date)  If change is editorial, THEN circle or mark "YES".  Editorial changes, as limited by STA-202, Attachment 8.F., do not require Technical Review, N	corrected plug ecord of 5/10 YES SR or
changes for details.  PREPARER (Signature/Date)  If change is editorial, THEN circle or mark "YES".  Editorial changes, as limited by STA-202, Attachment 8.F., do not require Technical Review, N	corrected plug ecord of 5/10 YES SR or
changes for details.  PREPARER (Signature/Date)  If change is editorial, THEN circle or mark "YES".  Editorial changes, as limited by STA-202, Attachment 8.F., do not require Technical Review, N	5/10 YES SR or
changes for details.  PREPARER (Signature/Date)  If change is editorial, THEN circle or mark "YES".  Editorial changes, as limited by STA-202, Attachment 8.F., do not require Technical Review, N	5/10 YES SR or
PREPARER (Signature/Date)  If change is editorial, THEN circle or mark "YES".  Editorial changes, as limited by STA-202, Attachment 8.F, do not require Technical Review, N	SR or
PREPARER (Signature/Date)    Dear System	SR or
Editorial changes, as limited by STA-202, Attachment 8.F, do not require Technical Review, N	SR or
Editorial changes, as limited by STA-202, Attachment 8.F, do not require Technical Review, N	SR or
50.59 Review.  TECHNICAL REVIEWER: Bever Gilbreuth Review, No. 150.59 Review.  Date: 4-15-10  Editorial changes, as limited by \$1A-202, Attachment 8.F., do not require Technical Review, No. 150.59 Review.  TECHNICAL REVIEWER: Bever Gilbreuth Review, No. 150.59 Review.  (Printed Name and Signature)  EXT.	
TECHNICAL REVIEWER: Bevery Gilbreuth Rwhy Gilbreuth  Date: 4-15-10  EXT.	
Date: 4-15-10 (Printed Name and Signature) EXT.	
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PROCEDURE CHANGE INTERIM APPROVAL	
S If the change does not change the intent of the procedure and the change must be incorporate	d immediately,
then complete this section; otherwise, route in accordance with Section III for review and appre	ovai.
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# 5TA-202-7 Attachment for MSM-G0-5870-RO-4 244-15-10

(For Information Only)		Record of Changes	Page 1
Rev/PCN	Affected Pages	Description of Change	
0/2	3, 3.1, 4, 7, 12	Changed verification holdpoint to be in compliance with ST clarification to welding instructions and separated instruction and Non-ASME components as some of the components comprocedure no longer fall under the jurisdiction of ASME Sec III per System Engineer.	ns for ASME vered in this
0/3	3	Added Step 5.5 to ensure Weld Data Record in included if no	ceded.
	5	Added directional statement for installing welded tube plugs locations.	in inaccessible
	13	Added Attachment 10.2 to list of attachments.	
	14.1 & 14.2	Added instruction for installing welded tube plugs in location to drilling and rolling activities. Ref. WO 366884. Added interpretate typical alternate weld details performed on H.P. Feedwater H.	formation on
0/4	2, 2.1, 3, 14	Added components CP1/2-COCNMC-01/02 and CP1/2-GSC non-ASME components to be included under the tube plugg methodology. Edited tube plugging methodology table to in exchangers listed in procedure. These components are new texchanger Program. Ref. CR-2009-005819.	ing clude all heat
0/5	14.2	Corrected tag numbers of feedwater heaters. Added that draw fabrication detail and added dimensions to drawing of tube p	
0/6	5	Step 8.4 - correct tag number for feedwater heaters in direction	onal statement.
	13	Attachment 10.2 - corrected title	
	14.1	Added tag numbers to title of attachment. Step 3 added new ID of hole for tube to be plugged and instruction to fabricate of Attachment 10.2.	-
	14.2	Changed plug projection minimum from 3/16" to 1/8".	

	PROCEDURE CHANGE FORM
ろ し ー ー 〇 m	DATE 04/13/10 PREPARER Dean Lystad EXT. 5985  PCN MSM-G0-5870-R0-5 /OTPCN WO#  TITLE Heat Exchanger Tube Plugging  CHANGED PAGE NO(s). 14.2  CHANGE JUSTIFICATION To add detail to clarify tube plug dimensions and correct location number of heat exchangers on Attachment 10.2. See record of changes for details.
<b>I</b>	PREPARER (Signature/Date)  If change is editorial, THEN circle or mark "YES".  Editorial changes, as limited by STA-202, Attachment 8.F, do not require Technical Review, NSR or 50.59 Review.  TECHNICAL REVIEWER:  Bevery Gilbreath  (Printed Name and Signature)  EXT. 0870
ошО⊢-ОZ	PROCEDURE CHANGE INTERIM APPROVAL  If the change does not change the intent of the procedure and the change must be incorporated immediately, then complete this section; otherwise, route in accordance with Section III for review and approval.  QUALIFIED REVIEWER:  (Printed Name and Signature)  EXT.  SHIFT MANAGER or UNIT SUPERVISOR:  (Printed Name and Signature)  EXT.  EXT.  REMARKS
	PROCEDURE CHANGE APPROVAL
	REVIEW ORGANIZATION APPROVED (Yes/No) QUALIFIED REVIEW (Init/Date)
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N	UPDATE OF PROCEDURES/FORMS USED FOR IN-PROGRESS ACTIVITIES REQUIRED: YESX NO
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	APPROVED BY: DATE: 4.13.10  (Signature) (Print name if not approval authority and change is editorial)
	STA-202-7 Page 1 of 1 R-0

## STA-202-7 Attachment for MSM-GO-5870-RO-5 DJ 4-13-10

(For Information Only)

## Record of Changes

Page 1

Rev/PCN	Affected Pages	Description of Change
0/2	3, 3.1, 4, 7, 12	Changed verification holdpoint to be in compliance with STA-694, added clarification to welding instructions and separated instructions for ASME and Non-ASME components as some of the components covered in this procedure no longer fall under the jurisdiction of ASME Section VIII, XI or III per System Engineer.
0/3	3	Added Step 5.5 to ensure Weld Data Record in included if needed.
	5	Added directional statement for installing welded tube plugs in inaccessible locations.
	13	Added Attachment 10.2 to list of attachments.
	14.1 & 14.2	Added instruction for installing welded tube plugs in locations inaccessible to drilling and rolling activities. Ref. WO 366884. Added information on typical alternate weld details performed on H.P. Feedwater Heaters.
0/4	2, 2.1, 3, 14	Added components CP1/2-COCNMC-01/02 and CP1/2-GSCNGS-01/02 as non-ASME components to be included under the tube plugging methodology. Edited tube plugging methodology table to include all heat exchangers listed in procedure. These components are new to the Heat Exchanger Program. Ref. CR-2009-005819.
0/5	14.2	Corrected tag numbers of feedwater heaters. Added that drawing provides fabrication detail and added dimensions to drawing of tube plug.

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		ROCEDURE CHANGE F		
	DATE02/17/10PREPARER	Kathryn Rogge	EXT5616	
	PCN MSM-G0-5870-R0-4	(PRINT NAME) /OTPCN	WO#	
	TITLE HEAT EXCHANGER T			
S E C	CHANGED PAGE NO(s). 2, 2, 1,	3 and 14		
c l	CHANGE ILISTIFICATION Added	components CP1/2-COCNMC	C-01/02 and CP1/2-GSCNGS-01/02 as	
Т		•	nodology. Edited tube plugging	
0			. These components are new to the Heat	
N	Exchanger Program. Reference CR-2	2009-005819		
	PREPARER (Signature/Date)	thum Reine	02/22/2010	
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	50.59 Review.  TECHNICAL REVIEWER: Beverl	v Gilbreath BUNNU	Gillmeath	
	- Olashlania	(Printed Name ar	nd Signature)	
	Date: 2/공식 2010	EDURE CHANGE INTERIM A	EXT. <u>0870</u>	
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PROCEDURE CHANGE FORM			
SECT	DATE 07/22/08 PREPARER_ PCN_MSM-G0-5870- R0-3 TITLE Heat Exchanger Tube Pluggic CHANGED PAGE NO(s). 3, 5, 13, 14 CHANGE JUSTIFICATION To provide	Dean Lystad (PRINT NAME)  /OTPCN ing 4.1 and 14.2  de instructions for installing we g operations in high pressure for	EXT5985  WO#  elded plugs in tube locations that are redwater heaters. Ref WO 366884.
1 O Z -	Editorial changes, as limited by STA-25 50.59 Review. TECHNICAL REVIEWER: あん	202, Attachment 8.F, do not re	EXT. 425/08 6870
SECT-OZ		e, route in accordance with Sector (Printed Name at TSOR:  (Printed Name at TSOR:	change must be incorporated immediately, etion III for review and approval.
	PROCEDURE CHANGE APPROVAL		
	REVIEW ORGANIZATION	APPROVED (Yes/No)	QUALIFIED REVIEW (Init/Date)
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E C	Welding Engineer		
)H-02	UPDATE OF PROCEDURES/FORMS IF YES, THEN SPECIFY DATE (effections) SORC Meeting No. and Date (If Applicable)	USED FOR IN-PROGRESS AC ctive date or other specified dat	CTIVITIES REQUIRED: YES_X_NO te): _effective date  EFFECTIVE DATE: _/0/2//08  Change is editorial)  STA-202-7
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# STA-202-7 ATTACHMENT for MSM-G0-5870-R0-3

(For Information Only)

## Record of Changes

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Page 1

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Rev/PCN	Affected Pages	Description of Change
0/3	3	Added Step 5.5 to ensure Weld Data Record in included if needed.
	5	Added directional statement for installing welded tube plugs in inaccessible locations.
	13	Added Attachment 10.2 to list of attachments.
	14.1 & 14.2	Added instruction for installing welded tube plugs in locations inaccessible to drilling and rolling activities. Ref. WO 366884. Added information on typical alternate weld details performed on H.P. Feedwater Heaters.

Р	ROCEDURE CHANGE	FORM
PCN_MSM-G0-5870-R0-2 TITLE HEAT EXCHANGER T  CHANGED PAGE NO(s). 3, 3.1,  CHANGE JUSTIFICATION Change added clarification to welding instruction as some of the components covered by VIII, XI or III per System Engineer.  PREPARER (Signature/Date) If change is editorial, THEN circle or not Editorial changes, as limited by STA-250.59 Review.	/OTPCN	e in compliance with STA-694, , s for ASME and Non-ASME components I under the jurisdiction of ASME Section  08/30/2006  YES quire Technical Review, NSR or
If the change does not change the into then complete this section; otherwise,  QUALIFIED REVIEWER:  Date:  SHIFT MANAGER or UNIT SUPERVI  Date:	ent of the procedure and the c route in accordance with Sec (Printed Name and Printed Name	hange must be incorporated immediately, tion III for review and approval.
F	PROCEDURE CHANGE APPE	ROVAL
REVIEW ORGANIZATION  QC  TRAINING/READING RECOMMEND  UPDATE OF PROCEDURES/FORMS IF YES, THEN SPECIFY DATE (effects)  SORC Meeting No. and Date (If Applicable)	APPROVED (Yes/No)  ED: YES NO_X IF YE  USED FOR IN-PROGRESS AC  tive date or other specified da	QUALIFIED REVIEW (Init/Date)  1.75 8 3 / 6  ES, THEN SPECIFY:  CTIVITIES REQUIRED: YES X NO_  Effective Date  EFFECTIVE DATE: SEP 1 3 2006
	DATE 08/29/06 PREPARER PCN MSM-G0-5870-R0-2 TITLE HEAT EXCHANGER TO CHANGED PAGE NO(s). 3, 3.1, CHANGE JUSTIFICATION Change added clarification to welding instruction as some of the components covered by the components covered by the components covered by the components covered by the change is editorial, THEN circle or reditorial changes, as limited by STA-250.59 Review.  TECHNICAL REVIEWER: Timother Date: 8/31/06  PROCE  If the change does not change the interview of the complete this section; otherwise, CUALIFIED REVIEWER: Date: SHIFT MANAGER or UNIT SUPERVIDATE: REMARKS  REVIEW ORGANIZATION  QC  TRAINING/READING RECOMMEND  UPDATE OF PROCEDURES/FORMS IF YES, THEN SPECIFY DATE (effects of the complete (if Applicable) M/A  SORC Meeting No. and Date (If Applicable)	TITLE HEAT EXCHANGER TUBE PLUGGING  CHANGED PAGE NO(s). 3, 3.1, 4, 7, and 12  CHANGE JUSTIFICATION Changed verification designator to be added clarification to welding instructions and separated instructions as some of the components covered by this procedure no longer fall VIII, XI or III per System Engineer.  PREPARER (Signature/Date) Fig. 1, 200 not respectively and the components of the components covered by this procedure no longer fall VIII, XI or III per System Engineer.  PREPARER (Signature/Date) Fig. 1, 200 not respectively and the components of the compo

DATE_05/19/05 PREPARER Dean Lystad EXT. 5985  PCN_MSM-Go-5870-R0-1 OTPCN WO#  TITLE Heat Exchanger Tube Plunging  CHANGED PAGE NO(s)_2_4_5 and 12 CHANGE JUSTIFICATION_To update reference 4.6, add reference 4.10 and to clarify note at beginning of Section 8.2 regarding requirements for repair/replacement activities per EPG-731. Added tag numbers for TPCW HX and Aux. Condenser to purpose statement. Added step and MM verification to ensure break-way stable of Poo-a Plus does not set left in system. Also to delete QC Holdpoint for plug material because Work. Order holdpoint will be assigned. Ref TOPs 2005-0061.  PREPARER (Signature/Date)		F	PROCEDURE CHANGE	FORM
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Page 1 of 1				Page 1 of 1

## COMANCHE PEAK STEAM ELECTRIC STATION

#### UNIT COMMON, 1 & 2

### MAINTENANCE SECTION - MAINTENANCE MANUAL

# **QUALITY RELATED**

HEAT EXCHANGER TUBE PLUGGING

PROCEDURE NO. MSM-G0-5870

REVISION NO. 0

EFFECTIVE DATE: August 29, 2002

PREPARED BY (Print):	Roger L. Barckhoff	Ext:	5034
TECHNICAL REVIEW BY (Print)	: Darron Jones	Ext: _	5619
APPROVED BY:SM	1ART TEAM MANAGER	Date: 4	-22-02

CPSES	UNIT	PROCEDURE NO.
MAINTENANCE SECTION - MAINTENANCE MANUAL	COMMON, 1 & 2	MSM-G0-5870
HEAT EXCHANGER TUBE PLUGGING	REVISION NO. 0	PAGE 2 OF 14

#### 1.0 PURPOSE

The purpose of this procedure is to describe methods of tube plugging for the following heat exchangers:

CP1/2-CCAHHX-01/02 CP1/2-MECCJW-01/02

CP1/2-MECCLO-01/02

CP1/2-COHTFH-01 through 08

CP1/2-FWHTFH-01 through 04

CP1/2-COCNAC-01/02

CP1/2-TWAHHX-01

CP1/2-COCNMC-01/02

CP1/2-GSCNGS-01/02

CP1/2-COHTDC-01/02

#### 2.0 ACCEPTANCE CRITERIA

This procedure contains in-process inspections. The acceptance criteria is the satisfactory completion of all applicable instructions.

#### 3.0 **DEFINITIONS/ACRONYMS**

- 3.1 HX Heat Exchanger
- 3.2 Pop-a Plug a brand name of plug featuring a separating tube plug with an expanding seal ring

#### 4.0 REFERENCES

- **4.1** CP-0049-001, Component Cooling Water Heat Exchanger
- 4.2 2323-MS-49, CPSES Specification, Component Cooling Water Heat Exchanger
- 4.3 Trane Company Manual for Retubing
- 4.4 CP-0024-001 and CP-0024-002, Closed Feedwater Heaters and External Drain Coolers, Struthers Wells (Units 1 and 2) respectively
- 4.5 STA-606, "Control of Maintenance and Work Activities"
- **4.6** EPG-731, "ASME Section XI Repair/Replacement Activities"
- 4.7 Technical Evaluation No. SE-90-2691
- 4.8 MSM-G0-0907, "Installation and Removal of Anti-Sweat and Thermal Insulation"

8

CPSES	UNIT	PROCEDURE NO.
MAINTENANCE SECTION - MAINTENANCE MANUAL	COMMON, 1 & 2	MSM-G0-5870
HEAT EXCHANGER TUBE PLUGGING	REVISION NO. 0	PAGE 2.1 OF 14

- 4.9 American Power Services, Inc., Explosive Plugging Procedure HPS-EP-021, Rev. 2
- **4.10** EPG-6.01, "ASME VIII Pressure Vessel Repair and Alteration"
- 4.11 CR-2010-003052 adding external drain coolers
- 4.12 CR-2010-004394 changing brush use limit to no more than 50 times
- 4.13 CP-0023-002, "Heat Exchange Equipment Surface Condenser" (Main Condenser)
- 4.14 CP-0060-001, "Surface Condenser and Auxiliary Equipment" (Aux. Condenser)
- 4.15 CP-0052-001, "Turbine Plant Cooling Water Heat Exchanger"
- **4.16** CP-0034-001C, "Associated Publications Volume III BK 1,2, & 3 (Diesel Generator Jacket Water Cooler)
- **4.17** CP-0003-002, "Steam Turbine Generator- Volume I" (Main Turbine Gland Steam Condenser)
- **4.17** CP-0003-004, "Related Equipment Manuals Volume II 2" (Main Turbine Gland Steam Condenser)
- **4.18** CP-0005-002, "Steam Turbine Feed Pump Drive" (Auxiliary Gland Steam Condenser)

#### 5.0 PRECAUTIONS, LIMITATIONS AND NOTES

5.1 Discrepancies or unsatisfactory results should reported to Responsible Maintenance Supervisor for follow-up actions in accordance with STA-606and documented in the "Remarks" section of this procedure.

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	НЕАТ	EXCHANGER TUBE PLUGGING	REVISION NO. 0	PAGE 3 OF 14
	5.2	The components listed below are under jurisdiction III (XI). The work order will indicate be preformed. Prior to any repairs, replacer reratings being performed on pressure vess notified of scope of work to be performed. opportunity to review work packages contatestablish hold points prior to beginning work.	ate as to what ASME ments, tube plugging a els Engineering Program ANII shall be notified ining ASME Section	section work is to alterations, or rams shall be and afforded XI activities and
		CP1/2-CCAHHX-01/02		8
		CP1/2-MECCJW-01/02		
		CP1/2-MECCLO-01/02		
	5.3	The following tag numbers are ASME Sect jurisdiction of Section III or XI).	ion VIII components	(not under
		CP1/2-COHTFH-01 through 08	CP1/2-FWHTFH-0	•
		CP1/2-COCNAC-01/02	CP1/2-TWAHHX-0	01
		CP1/2-COCNMC-01/02	CP1/2-GSCNGS-01	/02
		CP1/2-COHTDC-01/02		C
	5.4	Independent/concurrent verifications have l with STA-694.	been reviewed and are	e in compliance
	5.5	<u>IF</u> welded plugs are to be installed, <u>THEN</u> l record has been issued.	ENSURE an approved	l weld data
6.0	PRE	REQUISITES		
	6.1	ENTER the following information:		
		Work Order No.		
		Component Tag No.		
		Unit No.		
	6.2	appropriate) Inspector for review of work prior to any repairs, alterations, or reratings	ackage for any review	ANII (Circle as or hold points
		Person Contacted		_
		Date/Time/		

CPSES	UNIT	PROCEDURE NO.
MAINTENANCE SECTION - MAINTENANCE MANUAL	COMMON, 1 & 2	MSM-G0-5870
HEAT EXCHANGER TUBE PLUGGING	REVISION NO. 0	PAGE 3.1 OF 14

#### 7.0 TEST EQUIPMENT

#### 7.1 Recommended Tools and Materials List

Drill Bit w/pilot

Tube Rolling Tool

Bit for Counterboring

Tapered Pin

**Swagging Tool** 

Stub Removal Tool

Pop-A-Plug Go-No-go gauge

Pop-A-Plug

Explosive Plugs (CMAR 96-000153-00-00 for American Power)

Tube cleaning bruses

#### 7.2 Measuring and Test Equipment List

Snap gauge

Outside micrometer

CPSES MAINTENANCE SECTION - MAINTENANCE MANUAL		CO	UNIT OMMON, 1 & 2	PROCEDURE N MSM-G0-5870		
	HEAT EX	CHAN	GER TUBE PLUGGING	RE	VISION NO. 0	PAGE 4 OF 14
8.0	INSTR	UCTI	ONS			
	8.1	Gener	al		Table	of Contents
		8.1.1	For equipment that is Section XI any repair, replacement, tube plugging modification of pressure boundary part(s) or bolting materials shall be performed in accordance with instructions on work order and procedure EPG-7		General Tube Plugging F Driven Plugs Welded Plugs Pop-A-Plug	4
tified o	of scope o	of work	ts, welded tube plugging, sleevired on pressure vessels, Engineer k to be performed. For ASME III	ring F hest i	Programs Mana	ger shall be
beginn	ning work.	nu and	orded opportunity to review and	estab	lish hold points	for packages pri
OTE: M	ning work.	al plug	is installed in ASME components	estab	ish hold points	for packages pri
OTE: M	ing work.  fechanica n accorda eplaceme	al plug	is installed in ASME components	are (	considered a "Mand tube replace	for packages prid faintenance cements are
OTE: M	lechanica n accorda eplaceme	al plug ance v	is installed in ASME components with EPG-731. Welded plugs, sle	are concerns are to be provided to b	considered a "Mand tube replace	for packages pri faintenance cements are
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OTE: M	fechanica n accorda eplaceme 8.	al plugance vent Ac  2.1 2.2 2.3	is installed in ASME components with EPG-731. Welded plugs, sletivities.  DETERMINE AND MARK tube CLEAN tube to be plugged at both	estables are deves	considered a "Mand tube replace plugged at each e	for packages pridaintenance cements are end of bundle.
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CPSES	UNIT	PROCEDURE NO.
MAINTENANCE SECTION - MAINTENANCE MANUAL	COMMON, 1 & 2	MSM-G0-5870
HEAT EXCHANGER TUBE PLUGGING	REVISION NO. 0	PAGE 5 OF 14

#### **OC HOLD POINT** - Deleted

[IV]	supplie	VERIFY plug material (either manufactured or contractor d, as applicable) is correct.
8.3	Driven	Plugs
	8.3.1	MEASURE I.D. of tube to be plugged at both ends <u>AND</u> HAVE plugs made in accordance with Attachment 10.1.
	8.3.2	INSTALL proper size plug in each end of tube AND SET.
	8.3.3	ENSURE all tubes identified to be plugged have been plugged.
8.4	Welde	d Plugs
On High	Pressur	re Feedwater Heaters only (CP1/2-FWHTFH- 01, 02, 03, 04), <u>IF</u>

tube to be plugged is inaccessible for drilling and rolling due to being located too close to waterbox wall or partition plate, <u>THEN</u> PROCEED to Attachment 10.2 for alternate instruction.

- **8.4.1** SELECT a drill bit with pilot, as near as possible, but not exceeding O.D. of tube end to be plugged.
- **8.4.2** REMOVE tube to a depth of three inches using proper sized bit and pilot.
- **8.4.3** REMOVE any thin shell of tubing left in hole.
- **8.4.4** REMOVE all burrs from end of tube.
- **8.4.5** ROLL tube end 1-1/2 inches or within 1/8 inch of back of tube sheet, whichever is less.

CPSES MAINTENANCE SECTION - MAINTENANCE MANUAL	UNIT COMMON, 1 & 2	PROCEDURE NO. MSM-G0-5870
HEAT EXCHANGER TUBE PLUGGING	REVISION NO. 0	PAGE 6 OF 14

8.4.6 COUNTERBORE hole with a bit 3/16 inch larger than O.D. of tube. REFER to Figure 1.

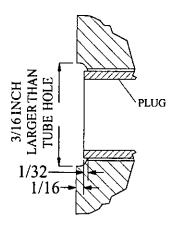


Figure 1

- 8.4.7 CLEAN AND DEGREASE hole.
- **8.4.8** MEASURE diameter of hole and have a plug prepared from 304 or 316SS in accordance with Figure 2.
- **8.4.9** EXPAND I.D. of plug using a tapered pin or swaging tool to ensure a tight fit.

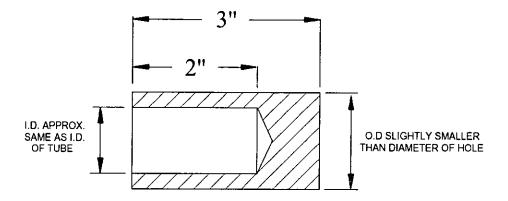


Figure 2

**8.4.10** INSTALL plug into hole flush to 1/32 inch above bottom of counterbore. REFER to Figure 1.

CPSES MAINTENANCE SECTION - MAINTENANCE MANUAL	UNIT COMMON, 1 & 2	PROCEDURE NO. MSM-G0-5870	
HEAT EXCHANGER TUBE PLUGGING	REVISION NO. 0	PAGE 7 OF 14	

**8.4.11** WELD plug to tube sheet in accordance with site welding procedures and work order instructions. REFER to Figure 3.

Welder \_\_\_\_\_ I.D. \_\_\_\_ Date \_\_\_\_

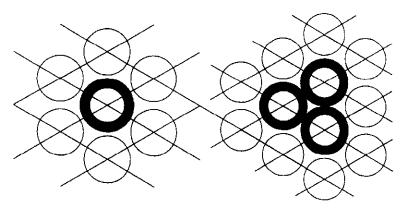


Figure 3

- **8.4.12** \_\_\_\_\_\_ ENSURE all tubes identified to be plugged have been plugged.
- **8.4.13** \_\_\_\_\_/\_\_\_\_ ROLL all tubes around plugged tubes for a minimum of three rows.

CPSES MAINTENANCE SECTION - MAINTENANCE MANUAL	UNIT COMMON, 1 & 2	PROCEDURE NO. MSM-G0-5870	
HEAT EXCHANGER TUBE PLUGGING	REVISION NO. 0	PAGE 8 OF 14	

#### 8.5 Pop-A-Plug

NOTE: Correct size of Pop-A-Plug must be 0.001" to 0.020" smaller than <u>actual</u> tube I.D. in position where plug is to be installed.

#### 8.5.1 Sizing

8.5.1.1 TAKE measurements both horizontally and vertically of each tube I.D. to a depth of 1-3/4 inches AND RECORD. Larger of measurements will denote tube I.D.

Horizontal	Inches
Vertical	Inches

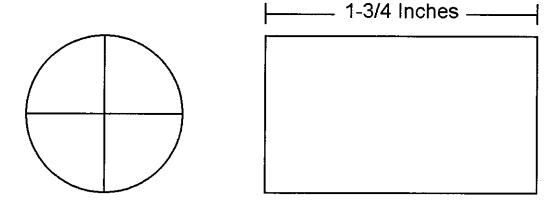


Figure 4

- 8.5.1.2 <u>IF</u> tube measurement cannot can be performed, <u>THEN</u> consult Manufacturer's tube data sheet. From data sheet DETERMINE if tubes have been rolled or expanded.
- 8.5.2 Preparation and Size Verification (Must be done for each tube being plugged.)
  - **8.5.2.1** IF applicable, USE a tapered reamer AND REMOVE any weld droop or eyebrow from I.D. of tube.

CPSES	UNIT	PROCEDURE NO.	
MAINTENANCE SECTION - MAINTENANCE MANUAL	COMMON, 1 & 2	MSM-G0-5870	
HEAT EXCHANGER TUBE PLUGGING	REVISION NO. 0	PAGE 9 OF 14	

NOTE: Go/No-Go Gage and tube brush are supplied with Pop-A-Plug II kit.

- 8.5.2.2 INSERT Go end of Go/No-Go Gage into tube end. If gage does not fit, kit selected is too large and a smaller kit should be selected and this step repeated.
- **8.5.2.3** IF Go end of gage fits, <u>THEN</u> ATTEMPT to fit No-Go end into tube.
- **8.5.2.4** IF No-Go end fits then kit chosen is too small. SELECT a larger kit and repeat step 8.5.2.2.
- 8.5.2.5 If GO end gage fits into tube to 1-3/4" minimum and No-Go end does not fit, <u>THEN</u> kit selected is proper size.
- **8.5.2.6** ENSURE tube brush and Pop-A-Plug II going to be used are marked with same size as on correct Go/No-Go Gage.

**CAUTION:** Excessive brushing can remove to much material and require using next larger size plug. Brushing for 30 seconds can remove approximately 0.005" of material.

NOTE: Do not use brush more than 50 times before replacement on Perma-Plugs and not more than 10 times for other Pop-a-Plug P-2s.

- **8.5.2.7** SELECT the smallest tube brush that interferes with the tube AND BRUSH tube as follows:
  - **8.5.2.7.1** Do not use an oversized brush, force the brush into the tube, bend the stem or reverse rotation.
  - **8.5.2.7.2** BRUSH using a back and forth motion from the tube opening to the plug installation depth to prevent tapered condition.
  - **8.5.2.7.3** BRUSH a minimum of 30 seconds.
  - **8.5.2.7.4** Do not use brush more than 50 times for Perma-Plugs and not more than 10 times for Pop-a-Plugs P-2.
- **8.5.2.8** INSPECT tube <u>AND</u> ENSURE tube is free from scale, pitting or other defects.
- 8.5.2.9 RE-GAUGE tube, <u>IF</u> No-Go end now fits into tube, <u>THEN</u> next larger Pop-A-Plug II must be used and steps 8.5.2.2 through 8.5.2.8 must be repeated.

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CPSES MAINTENANCE SECTION - MAINTENANCE MANUAL	UNIT COMMON, 1 & 2	PROCEDURE NO. MSM-G0-5870
HEAT EXCHANGER TUBE PLUGGING	REVISION NO. 0	PAGE 10 OF 14

#### 8.5.3 Hydraulic Installation

- **8.5.3.1** CHECK pump oil level.
- **8.5.3.2** CONNECT hose from pump to ram.
- **8.5.3.3** CONNECT air supply.
- **8.5.3.4** TEST ram/pump assembly.
- 8.5.3.5 OBTAIN proper pull rod assembly based on size of plug being installed.
- **8.5.3.6** VERIFY pull rod is assembled correctly. Directional arrows on pull rod assembly should always point towards Pull Rod end where plug will be attached.
- **8.5.3.7** Channel Head Pull Rod only: ADJUST Stand-off ring to allow each plug to be installed to desired depth.
- 8.5.3.8 THREAD selected Pop-A-Plug onto Pull Rod, ENSURE Breakaway thread is fully engaged into Pull Rod Assembly or stripping may occur.
- **8.5.3.9** INSERT Pull Rod into Ram with arrow pointing towards Pop-A-Plug.

NOTE: Knurled Nut for Pop-A-Plug II sizes 0.400-0.860 is stepped. Smaller diameter step should be installed towards ram.

- **8.5.3.10** INSTALL Knurled Nut onto Pull Rod until tight against large black nut on back of Ram.
- 8.5.3.11 ENSURE there is no "play" between parts of assembled Pull Rod and Plug Position and Plug Positioner is should be tight against ring of Pop-A-Plug II.

CPSES	UNIT	PROCEDURE NO.	
MAINTENANCE SECTION - MAINTENANCE MANUAL	COMMON, 1 & 2	MSM-G0-5870	
HEAT EXCHANGER TUBE PLUGGING	REVISION NO. 0	PAGE 11 OF 14	

8.5.3.12 HOLD Ram AND INSERT Pop-A-Plug II into tube to a depth of 1-3/4" (See Figure 5).

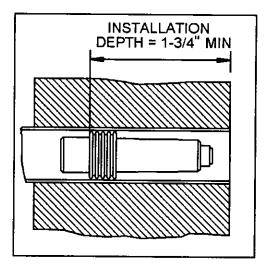


Figure 5

CAUTION: When using hydraulic ram, keep all personal and extremities clear from rear of ram. Always install safety cable then lock nut onto pull rod prior to plug.

NOTE: The hydraulic ram on PAP-6600 Ram Package has a maximum stroke of 1". When ram bottoms out, pressure shown on gauge will dramatically increase.

- **8.5.3.13** GUIDE ram with hands to avoid cocking <u>AND</u> ACTIVATE Hydraulic Pump by stepping on pedal marked "Pump".
- **8.5.3.14** CONTINUE to operate pump until plug "Pops" or stroke of ram bottoms out and pressure gauge on pump reaches 7000 psi.
- 8.5.3.15 IF after one full stroke of ram, Pop-A-Plug II has not contacted tube I.D., Pop-A-Plug II is too small. REMOVE plug AND REPEAT sizing steps of this procedure.

MAINTENANCE SEC	CPSES TION - MAINTENANCE	MANUAL	UNIT COMMON, 1 & 2	PROCEDURE NO MSM-G0-5870
HEAT EXCH	ANGER TUBE PLUGGIN	VG	REVISION NO. 0	PAGE 12 OF 14
	<b>8.5.3.16</b> IF a se	econd stroke is n	needed <u>THEN</u> :	
	8.5.3.16.1	CONTINUE	to support weight of	ram.
	8.5.3.16.2	STEP on "Re	elease" pedal on hydr	aulic pump.
	8.5.3.16.3		lack in Pull Rod by ti re is no play between ull Rod.	
	8.5.3.16.4	or if pressure	ug II does not "POP" e gauge reaches 7000 ig is too small. REM	psi before plug
			sure, <u>THEN</u> REMOV	
	breaka	away section.		
CAUTION: Care seremoving the break	should be taken to ensu	away section.		
	should be taken to ensuctaway stub.  8.5.3.18 from postub is	re the plug rema	ains seated in-place (recording to the control of t	undisturbed) when breakaway stub and breakaway
	should be taken to ensucaway stub.  8.5.3.18  from p stub is DISCA	way section.  The the plug remains of the plug	ains seated in-place (recording to the control of t	breakaway stub and breakaway ay stub from plug.
	should be taken to ensuctaway stub.  8.5.3.18 from p stub is DISCA  8.5.3.19 RETU	way section.  The the plug remains of the plug remains of the plug remains of the plug remains of the plug. ENSURE properties and forced when the plug remains of the	Carefully, REMOVE plug does not get hit as removing breakaway stub.	undisturbed) when breakaway stub and breakaway ay stub from plug.
removing the break	should be taken to ensure away stub.  8.5.3.18  from p stub is DISCA  8.5.3.19 RETU	way section.  Ire the plug remains a content of the plug remains a content of the plug. ENSURE properties and forced when the plug remains a content of the	Carefully, REMOVE plug does not get hit are removing breakaway stub.	undisturbed) when breakaway stub and breakaway ay stub from plug.

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CPSES MAINTENANCE SECTION - MAINTENANCE MANUAL	UNIT COMMON, 1 & 2	PROCEDURE NO MSM-G0-5870
HEAT EXCHANGER TUBE PLUGGING	REVISION NO. 0	PAGE 13 OF 14
Remarks:		

#### 8.6 Post Maintenance Activities

**8.6.1** ATTACH MSM-G0-5870 documentation and any other applicable documentation, forms, etc. to the Work Order <u>AND</u> PROCESS in accordance with STA-606.

#### 9.0 RESTORATION/POST WORK ACTIVITIES

None

#### 10.0 ATTACHMENTS/FORMS

- 10.1 Tube Plugging Data
- 10.2 Installing Welded Plug in Inaccessible Tube Location (High Pressure Feedwater Heaters (CP1/2-FWHTFH- 01, 02, 03, 04 ONLY)



CPSES MAINTENANCE SECTION - MAINTENANCE MANUAL	UNIT COMMON, 1 & 2	PROCEDURE NO. MSM-G0-5870
HEAT EXCHANGER TUBE PLUGGING	REVISION NO. 0	PAGE 14 OF 14

#### **ATTACHMENT 10.1**

#### Page 1 of 1

#### **TUBE PLUGGING DATA**

			Plug	ging Methodo	logy				
	Low Pressure Feedwater Heaters and External Drain Coolers***	High Pressure Feedwater Heaters**	CCW Heat Exchangers	DG JW/LO Heat Exchangers	TPCW Heat Exchangers	Aux Cndsr	Main Cndsr	Aux Gland Steam Cndsr	Main Gland Steam Cndsr
Driven	Х		Х	х				х	Х
Welded	Х	Х							
Pop-a- Plug*	×	Х	Х	Х	Х	Х	Х	Х	х
Explosive	Х	Х							
			Driven	Plug Specific	ations				
Material	Stainless	N/A	Brass	Brass	N/A	N/A	N/A	Stainless	Stainless
Length	1.5 Inch	N/A	1.5 Inch	1.5 Inch	N/A	N/A	N/A	1.5 Inch	1.5 Inch
Taper	See note below	N/A	0.010 in./in.	0.010 in./in.	N/A	N/A	N/A	See note below	See note below

<sup>-</sup> Preferred method

Note: One end of plug to be 0.015 to 0.020 inch larger than tube I.D. and the other end 0.015 to 0.020 inch smaller than tube I.D.

<sup>\*\* -</sup> High Pressure Feedwater Heaters are location numbers: CP1/2-FWHTFH- 01, 02, 03, 04 \*\*\* - External drain Coolers are location numbers: CP1/2-COHTDC- 01, 02

CPSES	UNIT	PROCEDURE NO.
MAINTENANCE SECTION - MAINTENANCE MANUAL	COMMON, 1 & 2	MSM-G0-5870
HEAT EXCHANGER TUBE PLUGGING	REVISION NO. 0	PAGE 14.1 OF 14

#### ATTACHMENT 10.2 Page 1 of 2

1.	inaccessible for the	purposes of dri	lling and/or tul	e rolling	UFY that tube location is ;. Otherwise RETURN to REVISE Work Order.		
	Location Inaccessible: Yes / No*						
	Location	Inacc	essible: <u>Yes / N</u>	<u>\\o</u> *			
	Location	Inacce	essible: <u>Yes / N</u>	<u>\\o</u> *	* - return to Section 8.4		
2.	CLEAN <u>AND</u> DEC	REASE hole.					
[IV	VERIFY hole to be p	lugged is clean	and degreased				
Loc	ation	IV	/	_ Sat	Unsat		
Loc	ation	IV	/	_ Sat	Unsat		
Loc	ation	IV	/	Sat	Unsat		
3.	MEASURE I.D. of with Page 2 of this		be plugged, A	<u>ND</u> FAB	RICATE plug(s) in accordance	(	
4	INSTALL plug into sheet.	hole leaving 1/	8 inch minimu	m protru	ding from surface of tube	,	
5.	WELD in accordance instructions. Typical						
	Location Welded						
	Welder:		I.D. No.		Date		
	Location Welded						
	Welder:		I.D. No.		Date		
	Location Welded						
					Date		

CPSES	UNIT	PROCEDURE NO.
MAINTENANCE SECTION - MAINTENANCE MANUAL	COMMON, 1 & 2	MSM-G0-5870
HEAT EXCHANGER TUBE PLUGGING	REVISION NO. 0	PAGE 14.2 OF 14

#### ATTACHMENT 10.2 Page 2 of 2

# INSTALLING WELDED PLUG IN INACCESSIBLE TUBE LOCATION (HIGH PRESSURE FEEDWATER HEATERS (CP1/2-FWHTFH- 01, 02, 03, 04 ONLY)

#### This is typical weld and fabrication information

Refer to Weld Data Record for welding instruction. See below for tube plug fabrication dimensions

Tubesheet: Stainless Steel Cladded SA-350 LF2

Tubes: Stainless Steel TP304 SA-249

Filler Material: ER-309

Final PT of tube plug weld required

SS-304 / SS-316 plugs may be made from Bar Stock A-182, A-276 or A479

Vendor Drawings: CP1-FWHTFH-01/02 Drawing 1-74-06-32419D1; CP1-FWHTFH-03/04

Drawing 1-74-06-32420D1; CP2-FWHTFH-01/02 Drawing 1-74-06-32426D1);

CP2-FWHTFH-03/04 Drawing 1-74-06-32427D1

