To: Rick Jacobs - NRC Proj. Mgr.

From: Licensing TMI-2
X 8551

November, 1982

Office of Nuclear Reactor Regulation
Attn: D. G. Eisenhut
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Sir:

Three Mile Island Nuclear Station, Unit 1 (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
Congressional Request for Information Concerning
Steam Generator Tube Integrity (Generic Letter No. 82-22)

The following responses are supplied at your request for information dated October 26, 1982 for TMI Unit 1 operation from 1979 to the present.

1. How many days of unscheduled outages can be attributed to steam generator-related difficulties per year at your site?

None. Although TMI-1 is currently undergoing steam generator repairs, the unit has been shut down since the TMI-2 accident as a result of unrelated licensing issues. Even if no steam generator work had been necessary, the unit would be in outage at the present time. Because these issues remain to be resolved, the extent to which steam generator-related work may impact the 1983 schedule is unknown.

2. During each of the years in question, how many steam generator tubes have been (a) plugged and (b) sleeved in each generator?

Twelve tubes in TMI-1's Once Through Steam Generators (OTSGs) were plugged prior to 1979. Three were plugged in 1979, and one in 1980. In late 1981, intergranular stress assisted cracking of the steam generator tubes was identified which occurred during the current outage. In most cases, the damage is located high in the generator, where the tubes are held in place by the two foot thick upper tubesheet. The location of the damage permits the use of a repair method called kinetic expansion. The tube is expanded against the tubesheet, creating a new mechanical joint below the damage. The new joint effectively removes the damaged portion from service, while permitting the remainder of the tube to be used. The kinetic expansion is being performed on the upper ends of all 31,000 TMI-1 tubes. Where damage has occurred on a tube that is too low to be removed from service by expansion, plugging is planned. Approximately 1200 tubes total for the two generators have been or will be plugged as a result of his problem. No sleeving has been done or is planned.

3. Do you anticipate major steam generator repairs in any of your units in the next five years and if so, how much would these repairs cost, please be

70

specific?

The current repair program is scheduled to be complete in early 1983, with no futher major repair work anticipated during the next five years. The final cost of all phases of this repair effort is estimated to be $35 million.

4. What have been the total costs and specifically replacement power costs associated with steam generator maintenance, repair and replacement at your plant?

The estimate of $35 million given in response to Question 3 includes inspection, maintenance and repair for the current program. As discussed in Question 1, no additional time has yet been spent in this outage as a result of steam generator difficulties, therefore there are no associated replacement power costs. Should steam generator related work become the controlling item in the outage schedule, replacement power costs would be approximately $12-13 million/month.

Note the following in considering responses to items 5-9.

All man-rem values for OTSG work are taken from self reading dosimeter (SRD) records. Thermolumenescent dosimeter (TLD) data is more accurate, but is cumulative over a period of time, and does not provide breakdown by task. There ir uncertainty in the estimates since in some cases records of exposure do not include a task description which is adequate to determine if OTSG work was involved.

5. What has been the total occupational radiation exposure (in person-rems) caused by steam generator (a) maintenance and (b) repair/replacement?

Data cannot be separated into maintenance and repair activities. Exposure estimates for 1979 were previously reported to the NRC. Dose from 1980 was not readily retrievable, but exposure estimates are low since steam generator work was limited to normal required eddy current testing and [redacted] plugging of one tube. For 1979, 1981 and 1982, total OTSG exposure is estimated as follows:

1979	25 person-rem
1981	18 person-rem
1982 (Jan-Oct)	154 person-rem

It is estimated that 300-380 additional person-rem can be anticipated in association with the current repairs for the period from October 1982 to completion. This estimate includes completing the kinetic expansion, expected plugging and testing of the repair work.

6. What percentage of total annual employee dose has been attributable to steam generator related work at your site?

As discussed above, data available for 1980 cannot be specifically correlated to steam generator activity, but exposures are judged to have been low. Estimates for 1979, 1981, 1982:

1979	3%
1981	11%
1982 (Jan-Oct)	60%

7. During the years in question (a) how many workers have received measurable radiation doses from steam generator related work, and (b) what percentage of the total work force do these workers represent?

Data available for 1979 and 1980 cannot be correlated with steam generator activity.

a. For 1981 and 1982, our best estimates of persons who received measurable radiation dose from OTSG related work are as follows:

1981	152
1982 (Jan-Oct)	244

Measurable radiation dose was defined as greater than 10 mRem on a self reading dosimeter.

b. These represent approximately the following percentages of all individuals monitored.

1981	10%
1982	18%

8. How many temporary workers (defined by NRC as all workers other than those hired directly by nuclear plants on a convenional, long term basis) received doses from steam generator related work at your facility each year?

The definition given for temporary worker includes a number of individuals at TMI for long periods of time. Included in this category are representatives of specialized firms retained to assist in early evaluation of the OTSG damage, Babcock and Wilcox personnel, and advisors from the developers of the kinetic expansion process. There were also a limited number of local craft union personnel hired for short periods of time to perform specific tasks in the generators.

Information available for 1979-1980 cannot be correlated with steam generator activities, but the number of temporary workers was small. For 1981 and 1982, the number of temporary workers receiving measurable exposures (greater than 10 mRem) and associated exposure are estimated to be:

	No. Temporary OTSG Workers	OTSG person-rem
1981	62	13
1982 (Jan-August)	189	120
Remaining Repair (projected)		25-35

9. What percentage of (a) total workers involved with steam generator-related work do temporary workers represent, and (b) of the total work force do temporary workers represent?

a. The temporary workers discussed above represent the following percentages of all temporary workers in the OTSGs.

	% OTSG Workers	% OTSG person-rem
1981	41%	72%
1982 (Jan-August)	78%	63%
Remaining Repair (Projected)	5%	7-10%

Now that the evaluation phase of the OTSG project is over and actual repair work has begun, approximately 95% of all workers involved with the steam generator repair are regular long-term GPU employees.

b. Available records cannot readily be correlated to provide an estimate of the percentage of the total work force that temporary employees represent.

10. Has your company used independent firms to find temporary employees who have received an occupational dose from steam generator-related work?

Our company has not used any independent firms for the purpose of finding and recruiting temporary employees to work for short periods of time in the steam generators. However, we have used independent firms to provide specified services in some areas of steam generator activity. For example, the NSSS vendor, B&W, has supplied assistance in the current repair effort and the developers of the kinetic expansion repair method have supplied experts in the process. In a very limited number of cases, an independent firm has employed temporary workers to perform portions of a contracted task in the generator.

Sincerely,

u n Hukill
President, TMI-1

TO: C.W. Smyth
T. 8551
F: M. Graham

4 PAGES

GPU Nuclear

SPECIAL PROCESSES AND PROGRAMS (SPP)

SPP – Welding Procedure Specification **WPS No.** 04324

Revisions	Date	Supporting GPUN PQR No.	Date	Supporting GPUN PQR No.	Date
0	11/16/82	094	11/16/82		

Applicability

Welding Process: Manual Gas Tungsten Arc Welding of Inconel

Base Metals: P. No. 43 to P. No. 43

Thickness Range Qualified (in):

	Impact Properties Not Required	Impact Properties Required (per Code)
Without Postweld Heat Treatment	All Sizes of Fillet Welds	N/A
With Postweld Heat Treatment	N/A	N/A

Note: Postweld Heat Treating Requirements are Determined by Applicable Construction/Repair Code.

Filler Metals

Process	GTAW	
F. No.	43	
A. No.	NiCrMo-3	
Spec. No. (SFA)	5.14	
AWS No. (Class)	ER-NiCrMo-3	
Dia. of Filler Metal	1/16"	
Consumable Insert	N/A	

Other: Tungsten Electrode - 2 percent Thoriated Tungsten Electrode of 1/16" or 3/32" diameter shall be used.

Preheat

Preheat Temp.: 50°F Minimum

Interpass Temp.: 400°F Maximum

Preheat Maintenance: Until completion of weld

Other: N/A

Postweld Heat Treatment

Temperature: N/A

Time Range: N/A

Other: N/A

Position

Position of Groove: N/A

Welding progression: Uphill if vertical

Other: All positions - Fillet Type Welds

A0000345

Gas

Shielding Gas(es): Argon

Percent Composition (Mixtures): 99.99 percent Pure

Flow Rate: 15-20 CFH

Gas Backing: N/A

Trailing/Shielding Gas Composition: N/A

Other: Gas Backing not required for Fillet Type Weld.

Electrical Characteristics

Current (AC or DC): DC Polarity: Straight

Amps (Range): Page 3 Volts (Range): Page 3

Travel Speed (Range): 1 to 3 I.P.M.

Other: See Page 3 for Amp and Volt ranges.

Technique

String or Weave Bead: String

Orifice or Gas Cup Size: 1/4" to 3/8" Diameter

Initial & Interpass Cleaning (Brushing, Grinding, etc.): Brushing, Grinding (Note 1)

Method of Back Gouging: N/A

Oscillation: N/A

Contact Tube to Work Distance: N/A

Multipass or Single Pass (per side): Single

Single or Multiple Electrodes: Single

No. of Beads: (1) Stringer Bead

Other: Peening not permitted

NOTE 1: Brushing shall be accomplished using Stainless Steel type wire brush not previously used on Carbon Steel or low alloy steel. Grind with alumina or silcon carbide wheel.

Joints

Groove Design: See Page 3

Backing: N/A

Other: Fillet Type Weld

The applicable joint design for this WPS is shown on Page 3.

Sketch

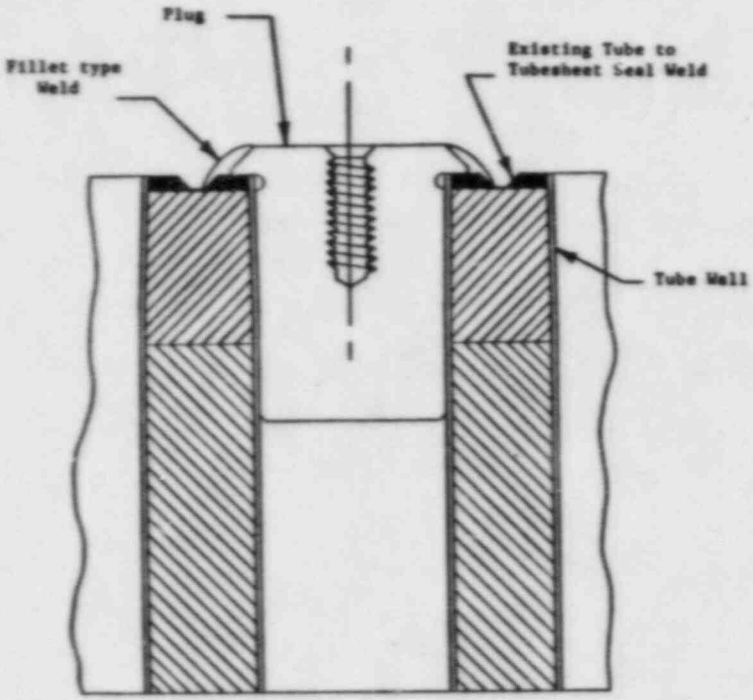
The work performed to this specification shall also meet the applicable requirements of the GPUN Welding Program.

Prepared by: D. K. McConnell

Approved by: R.B. Coltt

APPLICABLE JOINT DESIGN

OTSG Tube/Tubesheet Plugging



GPU Nuclear

SPECIAL PROCESSES AND PROGRAMS (SPP)

Electrical Characteristics

Filler Metal	Recommended Electrical Conditions							
Type	ER-NiCrMo-3							
Diameter	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts
1/16"	70-80	9-11						
Current	Direct							
Polarity	Straight							

Date 11-16-82	Welding
D. K. McConnell	Joint Designs and Electrical Characteristics
Appr.	WPS No. 04324 Rev. No. 0

GPU Nuclear

Special Processes & Programs

GPU NUCLEAR
PROCEDURE QUALIFICATION RECORD (PQR)
FOR PLUG TO TUBE/TUBESHEET

Procedure Qualification Record No. GPUN-094 Date 11-13-82
WPS No. GPUN-04324
Welding Process(es) Gas Tungsten Arc Welding
Types (Manual, Automatic, Semi-Auto.) Manual

JOINTS (QW-402)

See Figure #1, 2, (3), 4, (5)

BASE METALS (QW-403) (Seal Weld)(Tube)(Plug)
Material Spec. ER-NiCr-3 SB-163 SB-166
Type or Grade N/A
P. No. 43 to P. No. 43
Thickness Fillet Type Weld
Diameter .710"
Other N/A

FILLER METALS (QW-404)
Weld Metal Analysis A No. NiCrMo-3
Size of Electrode 1/16"
Filler Metal F No. 43
SFA Specification 5.14
AWS Classification ER-NiCrMo-3
Other N/A

POSITION (QW-405)
Position of Groove N/A
Weld Progression (Uphill, Downhill) N/A
Other Fillet Weld Performed in 2F Position.

PREHEAT (QW-406)
Preheat Temp. 50°F Minimum
Interpass Temp. 400°F Maximum
Other N/A

POSTWELD HEAT TREATMENT (QW-407)
Temperature N/A
Time N/A
Other N/A

GAS (QW-408)
Type of Gas or Gases Argon
Composition of Gas Mixture 99.99% Pure
Other Shielding 15-20 CFH

ELECTRICAL CHARACTERISTICS (QW-409)
Current D.C.
Polarity Straight
Amps. 75 Volts 10
Other N/A

TECHNIQUE (QW-410)
Travel Speed 1.5 I.P.M.
String or Weave Bead String
Oscillation N/A
Multipass or Single Pass (per side) Single
Single or Multiple Electrodes Single
Other N/A

RESULTS

Specimen No.	PT Results	VT Results	Pass/Fail
1	Satisfactory	Satisfactory	Pass
2	Satisfactory	Satisfactory	Pass
3	Satisfactory	Satisfactory	Pass
4	Satisfactory	Satisfactory	Pass
5	Satisfactory	Satisfactory	Pass

Test Conducted By: Sam Saha VT Data Report # 90668

Test Conducted By: Bill Kimmick PT Data Report # WE-43301-82

Welder's Name T. Purin Clock No. 53-001 Stamp No. B-001

Tests conducted by: C. F. Leonard Laboratory Test No. 90668/WE-43301-82

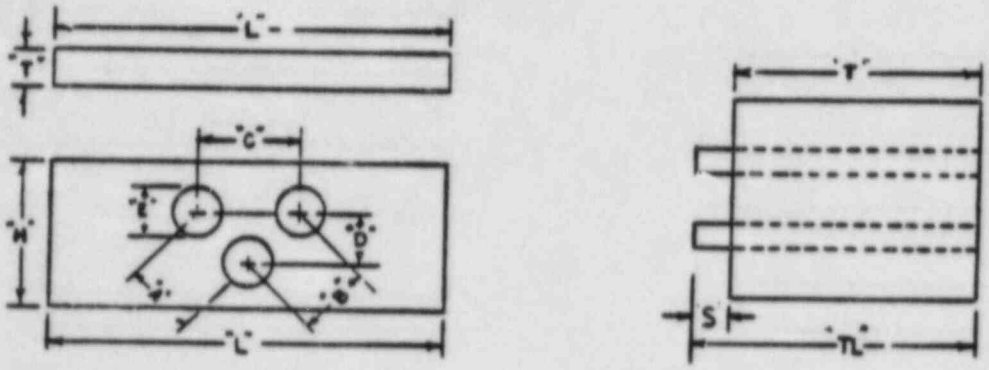
We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code, and Section XI of the ASME Code.

Manufacturer GPUN

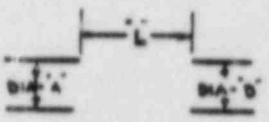
Date 11-16-82 By W. R. McConnell

FIGURE # 3

PERFORMANCE TUBE/TUBESHEET PLUGGING MOCK-UP REQUIREMENTS



PLUG DIM.



TUBE HOLE SPACING "A" .875"
"B" .875"
"C" .875"
"D" .758"
"E" .625"

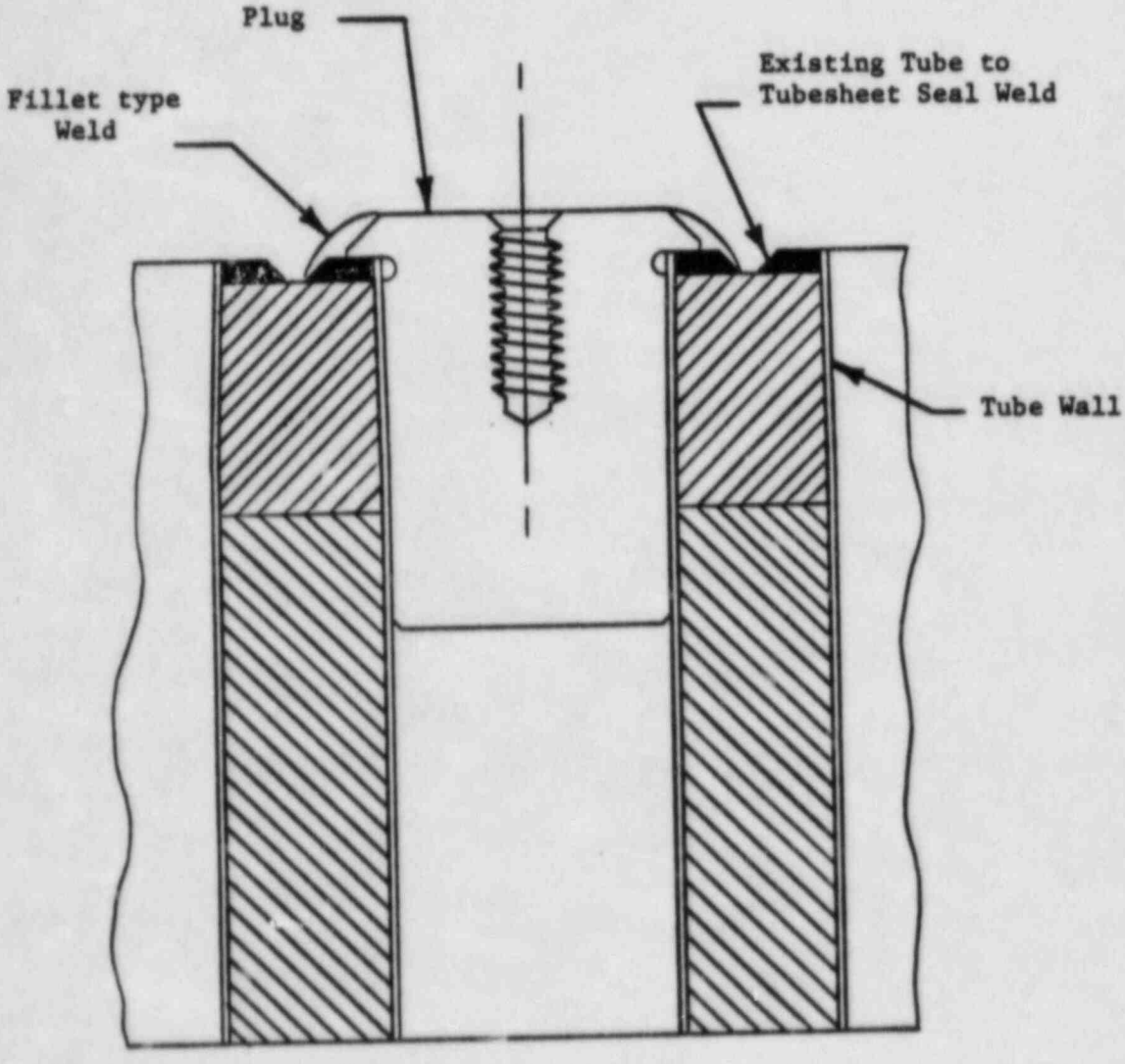
TUBE DIMENSION "TL" 2.593"
"ID" .557"
"OD" .625"
EXT. " S" .030"

TUBE SHEET DIMENSION "L" 5-3/4"
"E" 1-1/8"
"T" 2-9/16"

PLUG DIMENSION "A" DIA. .710"
"B" DIA. .555"
"L" 1.097"

FIGURE #5

OTSG Tube/Tubesheet Plugging



GPU Nuclear

Special Processes & Programs

Attachment #2

RECORD OF WELDER

QUALIFICATION TEST FOR PLUG TO TUBE/TUBESHEET

Name T. Purin Station TMI

Welder ID B-001 Employee No. 53-001 Date 11-13-82

TEST PERFORMED IN ACCORDANCE WITH:

WPS/Welder Test No. GPUN-04324

Process Gas Tungsten Arc Welding

Base Metals: ASME Spec SB-166 (Plug) To ER-NiCr-3(Existing Seal Weld) SB-163(Tube)

P-No. 43 To 43

Thickness Fillet (All sizes and thickness) Diameter .710" O.D.

FILLER METALS

Process GTAW

F-No. 43

A-No. NiCrMo-3

Spec. No. (SFA) 5.14

AWS No. (Class) ER-NiCrMo-3

Manufacturer Huntington Alloy

Trade Name ER-625

Diameter 1/16"

Other N/A

PREHEAT

Preheat Temp. 50°F Minimum

Interpass Temp. 400°F Maximum

Preheat Maintenance Until completion of the weld.

POSTWELD HEAT TREATMENT

Temperature N/A

Time N/A

Heat/Cool Rate N/A

Other N/A

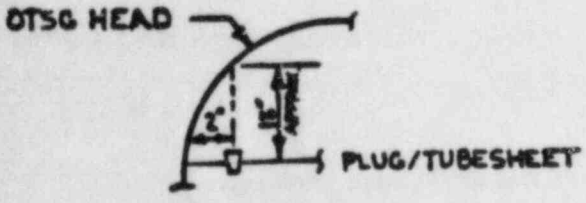
POSITION

Position of Tubesheet Mock-Up 2F

JOINTS

See Figures # 1, 2, (3), 4, (5)

Special Access Condition, Sketch:



GAS

Shielding Gas Argon

Composition 99.99% Pure

Flow Rate 15-20 CFH

Gas Backing N/A

Other Gas backing not required for fillet type weld.

TECHNIQUE

String or Weave Bead String

Orifice or Gas Cup Size 1/4" - 3/8"

No. of Layers N/A

No. of Beads (1) one

ELECTRICAL

Process GTAW

Current DC

Polarity Straight

Amps 75

Volts 10

Travel Speed 1.5 I.P.M.

Electrode Dia. 1/16"

Tungsten Elec. Dia. 1/16"

RESULTS

Specimen No.	PT Results	Macro VT Results	Pass/Fail
1	Satisfactory	Satisfactory	Pass
2	Satisfactory	Satisfactory	Pass
3	Satisfactory	Satisfactory	Pass
4	Satisfactory	Satisfactory	Pass
5	Satisfactory	Satisfactory	Pass

Test Conducted by: C. F. Leonard

(VT)By: S. Saha (PT)By: B. Kimmick

VT Data Report # 90668

PT Data Report # WE-43301-82

CERTIFICATION OF QUALIFICATION

By the results of this test, this welder is qualified to weld under the following conditions:

Process GTAW

Material P-No. 43

Thickness Range All thk./size Fillets

Diameter Range .710" O.D. & Over

Backing N/A

To P-No. 43

To N/A

Position 2F

Special Restrictions Note: See Sketch Under Position

Remarks: This WQR is based on Welder B-001 qualifying P.Q.R.-GPUN-094, which established GPUN-WPS No. 04324.

I certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Sections IX and Section XI, of the ASME Code.

Date 11-16-82

Organization GPUN

By C F Leonard

NOV 17 1982

Inter-Office Memorandum

Date November 16, 1982

GPU Nuclear

Subject Evaluation of OTSG Stabilizer Plug (Modified Design) Welds for Welding Procedure Qualification - TMI #1
Lab Nos. - 90668 & 90669

To C. K. LEE Location Reading

On November 13, 1982, the GPUN Laboratory was provided with two sets (each containing five welds) of newly designed stabilizer plugs welded to tube/seal weld. It was reported that Set #1 (Lab #90668) was welded by Mr. T. Purin and Set #2 (Lab # 90669) by Mr. R. Hamilton using manual GTAW process with 1/16" diameter ER-Ni Cr Mo-3 (Inconel-625) filler wire. It was also reported that all of the welds have been accepted by liquid penetrant test. The laboratory was requested to evaluate the welds to the requirements of ASME Section XI and B&W Field Weld Detail as shown in Figure 1, such that new plug design and welding procedure could be approved.

Evaluation and Conclusion

a) Twenty (20) weld faces from Set #1 (Lab #90668) were examined at 10X, 50X and 100X. All welds showed sound fusion and none revealed any rejectable defect.

b) The horizontal weld leg, vertical weld leg and weld throat sizes at 45° and 67 1/2° were measured on all twenty weld faces of Set #1 and were found to be over .027". The minimum acceptable throat size for welding procedure qualification as ASME Section XI is .023" and the same as per B&W calculation is .027". The details of the measurement are shown on Table 1.

c) Twenty (20) weld faces from Set #2 (Lab #90669) were examined at 10X, 50X and 100X. One weld (Weld #2-4) showed a large crack in the weld which was visible at 1X.

d) The crack on the Weld #2-4 of Set #2 does not appear to be related with the design of the plug or plug material at this stage. It appears to be an isolated case and may have been caused by some external factors such as welding technique, presence of foreign material, etc. The laboratory is investigating further to determine the cause of cracking.

e) Based upon above observations, the writer concludes that:

1. The new plug design is adequate to meet the welding requirements as set by B&W.

2. The welds on Set #1 have met the welding procedure qualification requirements of ASME Section XI.

3. The welds on Set #2 are unacceptable because of the crack observed and the welder should be requalified. Weld throat measurements, however, were over .027".

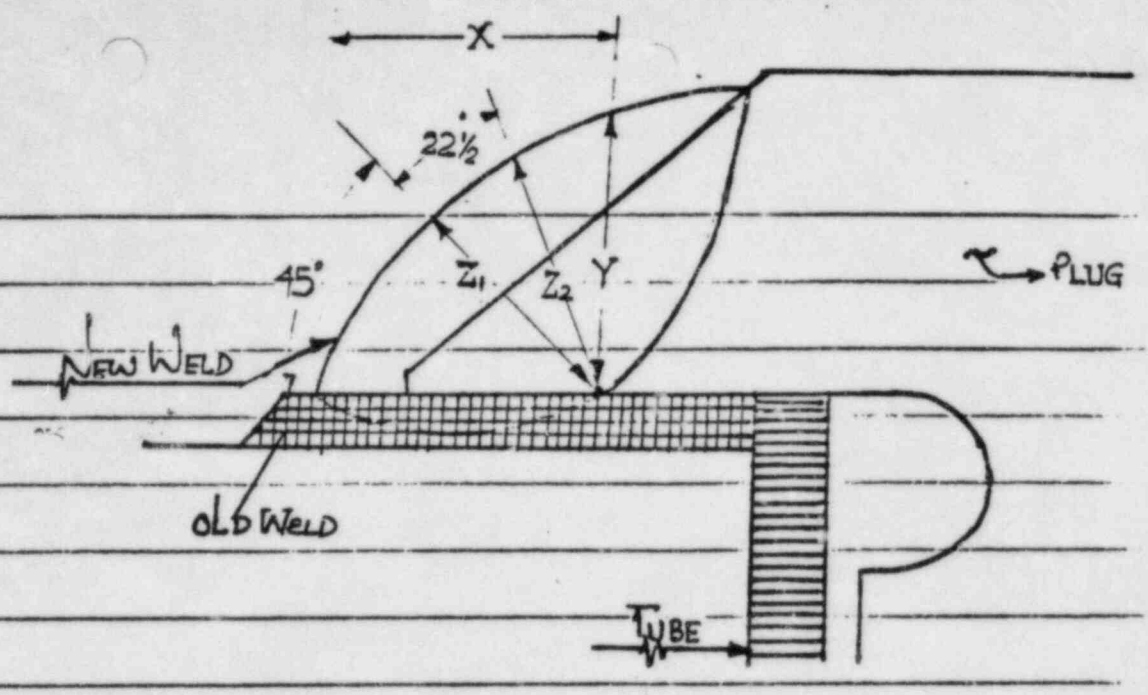
S. K. Saha

SKS/HSG/mjs

cc: R. B. Corbit
F. S. Giacobbe
B. D. Elam
F. Faist
N. C. Kazanas
S. Levin
File

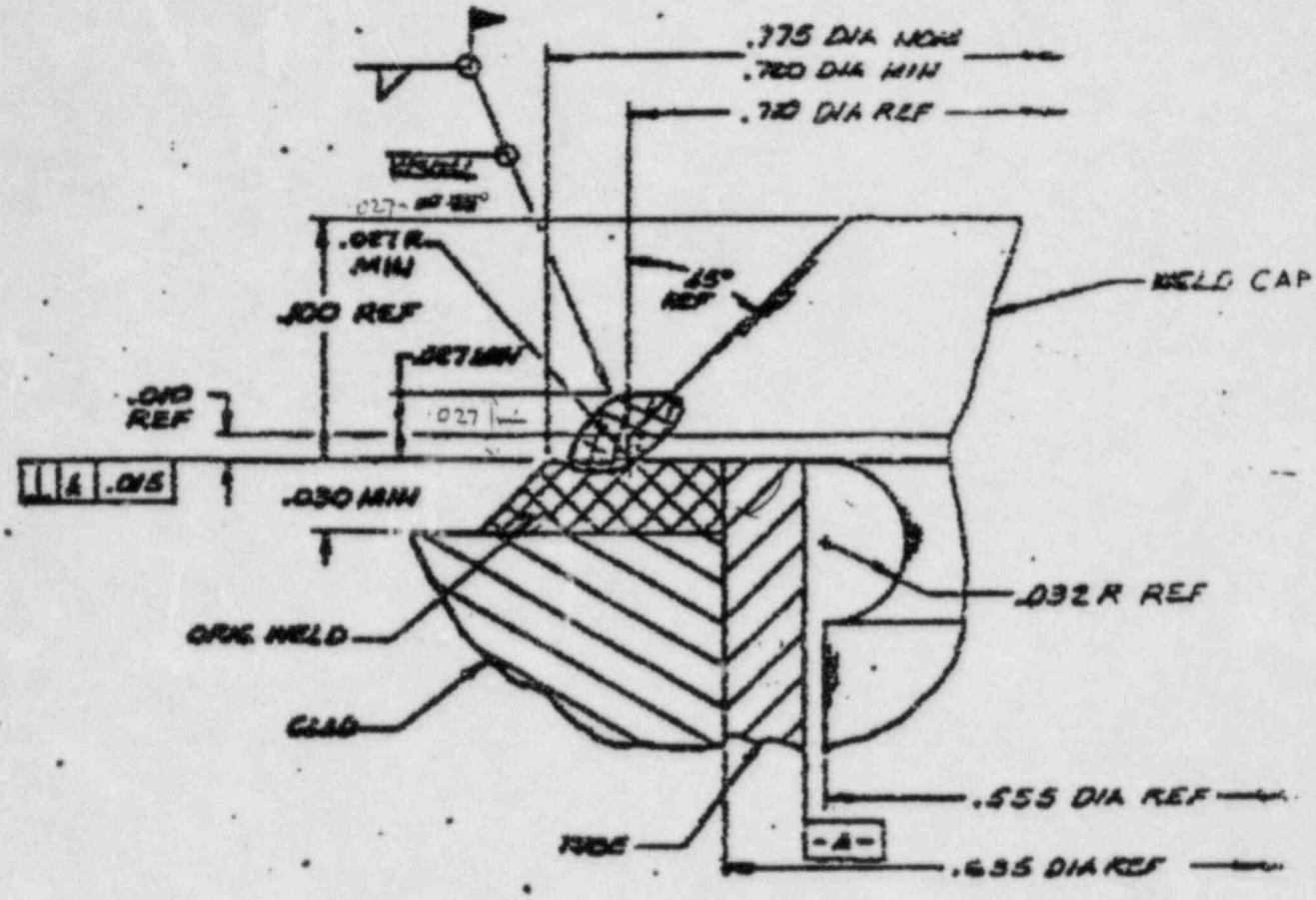
Lab # 90668
OTSG Plug Welds
(New Design)

Welder: T. Purin
#B-1



WELD No.	X (Inch)	Y (Inch)	Z_1 (Inch)	Z_2 (Inch)	WELD NO.	X (Inch)	Y (Inch)	Z_1 (Inch)	Z_2 (Inch)
1 - 1	.100+	.076	.074	.070	4 - 1	.093	.066	.058	.058
1 - 2	.096	.058	.062	.057	4 - 2	.100+	.060	.078	.060
1 - 3	.100+	.062	.062	.059	4 - 3	.100+	.071	.070	.065
1 - 4	.100+	.053	.054	.050	4 - 4	.100+	.055	.058	.051
2 - 1	.086	.065	.060	.059	5 - 1	.100+	.082	.093	.081
2 - 2	.100+	.059	.062	.057	5 - 2	.091	.068	.066	.062
2 - 3	.100+	.064	.063	.058	5 - 3	.100+	.080	.088	.078
2 - 4	.100+	.062	.067	.060	5 - 4	.100+	.059	.064	.057
3 - 1	.100+	.079	.081	.074					
3 - 2	.100+	.057	.068	.058					
3 - 3	.100+	.074	.082	.074					
3 - 4	.100+	.063	.069	.062					

TABLE 1



B & W - FIELD WELD DETAIL

FIGURE - 1

Page 1 of ___

QUALITY ASSURANCE MODIFICATIONS/OPERATIONS
QUALITY CONTROL PLANT INSPECTION REPORT

Unit No. I Inspector W.L. Kimmich

UE
PIR No. 43301/82

Inspection Description Visual dye penetrant examination of new nail head plugs definition for OTSG stabilization. This was a procedural qualification

Method: Visual: ☐ Direct Measurement: ☐ Document Review: ☐ Other: ☒

References:

Title	Rev.	Date	Verified
MWS 001	0	1-13-82	
MWS 003	0	1-27-82	

Vendor/Item Identification (as appropriate)	Item/Characteristic/ Activity To Be Inspected	Accept/ Reject Criteria	Inspection Results/ Readings	Compliance		
				Sat	Unsat	Not Applic.
Plug #1, 2, 3, 4, 5	5 plug coupon performed by welder B1	Para 7.0 MWS-0012	acc			
Plug #1, 2, 3, 4, 5	5 plug coupon performed by welder B34	Para 7.0 MWS-0012	acc			

MO-108-1 (Rev. 0)

TMI-207 6-80

Page 2 of ___

QUALITY CONTROL PLANT INSPECTION REPORT

PIR No:

Vendor/Item Identification (as appropriate)	Item/Characteristic/ Activity To Be Inspected	Accept/ Reject Criteria	Inspection Results/ Readings	Sat	Unsat	Not Applic.

N/A

Measuring and Test Equipment Used

Identification of Equipment	Serial No.	Calibration Date Due

N/A

MNCR Issued: Yes [ ] No [ ] QDR Issued: Yes [ ] No [ ]

MNCR QDR No.	Date	Reason for Issue	Hold/Condit. Release Tag Nos. Issued

N/A

Comments/Other Information: Welders qualification verified with qualification record

Inspected By: [signature] Date: 11-13-82

Reviewed and Approved By: [signature] Date: 11/16/82

Distribution
(✓) Manager Admin. and Services Unit 1 (Orig.)
( ) QA Mod/Ops Manager
( ) QC Manager
(✓) File

Others:
(✓) M Hopple
(✓) B Leonard
(✓) R Corbin
( )

MO-10S-2 (Rev. 0)

GPU Nuclear

000620

NDE

Visual/Surface Data Sheet

Site: TMI	Inspection ID: N/A			Component: Tube sheet (OTSG) coupon	
Description: new modified nail head to seal weld procedure qualification					
I.D.: N/A	Procedure: TMIS 007	Material: S/S		Thickness: N/A	Test Surface: N/A
Test Method: Visual dye	No. Positions: N/A	Distance: N/A In.	Drawing: N/A		Date: 11-13-82
Examiner: Kimmich	I.D.: A411	Level: II	Notes:		
Examiner: N/A	I.D.: N/A	Level: N/A			

Magnetic Particle (Only)

Particle:
Wet ☐ Dry N/A ☐ Color
Visible ☐ Fluorescent ☐ Batch

Instrument:
Method Current
Machine Amperes

Dye Penetrant (Only)

Cleaner Batch # B14055
Penetrant Batch # 6A035
Developer Batch # B1CDER

Method:
Visible ☒ Thermometer QC-T2
Fluorescent ☐ Temp 60°

Notes:
welders ID B-1
B-39
Filler metal ER625
1/16"

Ind. No.	Status	Size (Inches)	Distance From (Inches) CW	CCW	1	2	Surface	Remarks
		N/A						Performed visual dye penetrant exam on two five plug coupons for procedure qualification of new modified nail head. All five welds on both coupons were found to be satisfactory.

No Reportable Indications ☐ Reportable Indications ☐ Non Relevant Indications ☐

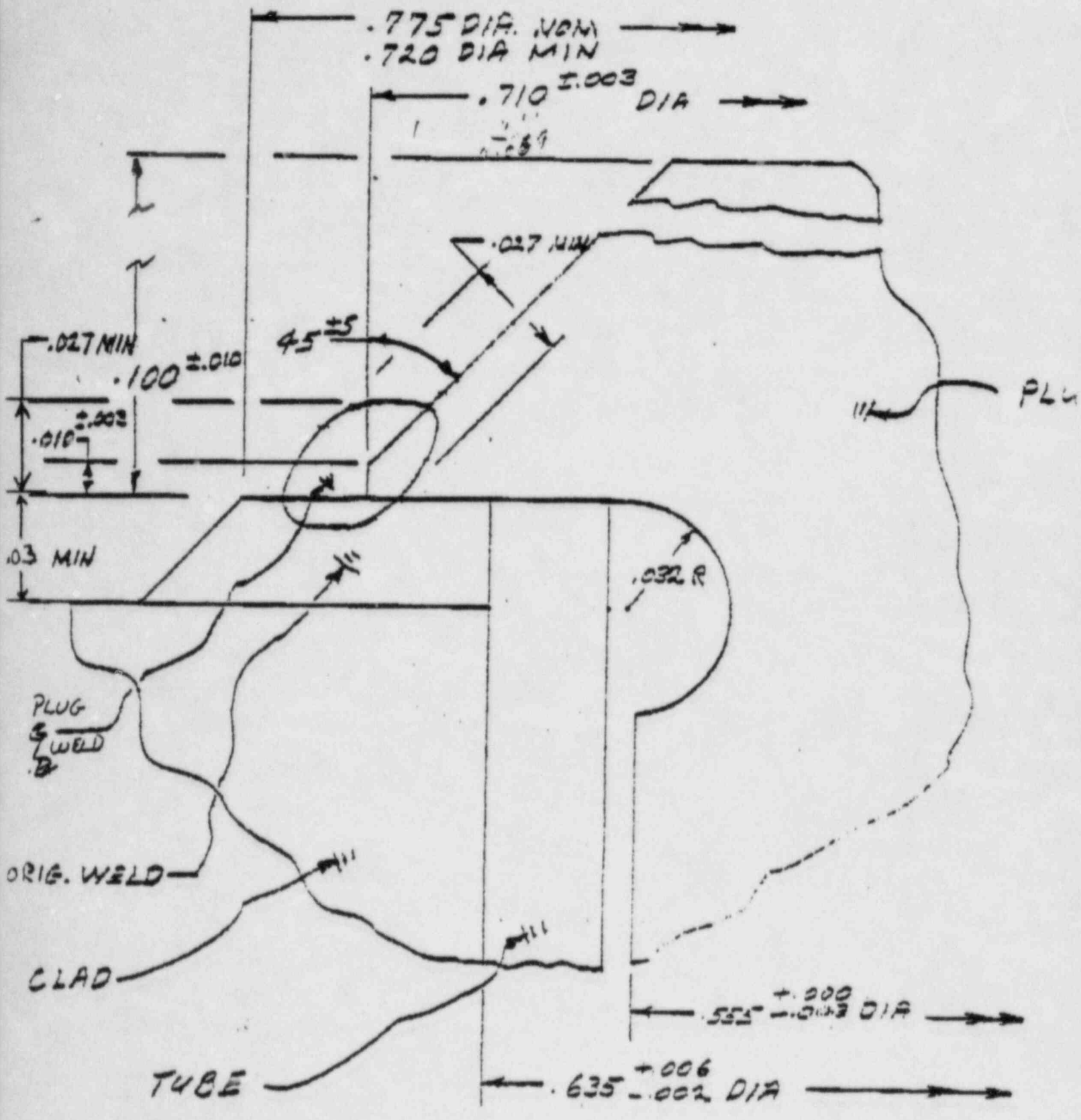
Reviewed by:	Level:	Date:	Page of	NDE Request No.

Method/Ind. No. Visual/0-199 P.T./200-399 M.T./400-599 Other/600-799

A0000925

— PRELIMINARY — Patte

TMI-1 PLUG WELD DETAIL



Culberson to Faist
11/2/82 TR# ——

STEVE K. BROWN

BABCOCK&WILCOX Nuclear Power Generation Division Copy to J. Powell

To [redacted], CUSTOMER ENGINEERING SERVICE	SWMP-20151
From L. D. DIXON, MECHANICAL DESIGN UNIT	Customer or PRe
Subject TMI-1 OTSG PT	Date NOVEMBER 2, 1982

Additional information is required to assist in the evaluation of upper TTS weld and clad integrity and its impact on tube plug designs. Therefore, Engineering requests that F. Faist provide the following:

1. PT a minimum of 10 upper TTS OTSG welds. It is desirable, although not necessary, to split the samples between OTSG A and B.
2. The test should be done all of the way around each weld selected, and should pick up a portion of adjacent welds.
3. Select the welds from areas in the OTSG(s) where corrosive action on tube ends is most evident.
4. Use the type of penetrant and PT procedure that are normally used on site.
5. Report and characterize <u>any</u> indications seen. - photos?

It is requested that this data be provided as soon as possible.

L. D. DIXON

/cc

cc: SK BROWN
AD MCKIM
MH FISH
DG CULBERSON
JM HELMEY

To FR Faist

Please pass this on to GPUN on site and to M. Fish. Culberson will formally send this out.

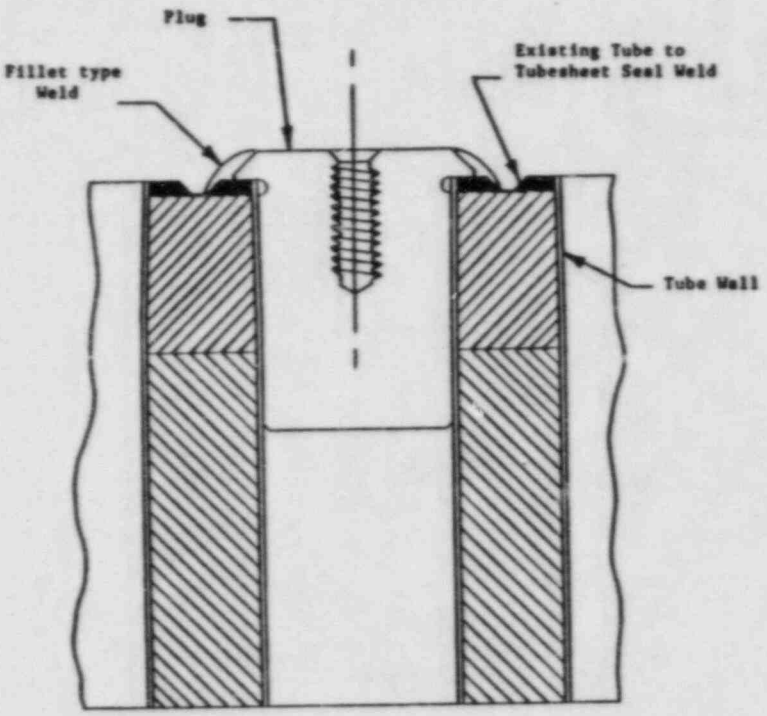
RA Baker

XC
to from - D. Culberson
M Fish
L. Stanek
Dixon

FILE

APPLICABLE JOINT DESIGN

OTSG Tube/Tubesheet Plugging



GPU Nuclear

SPECIAL PROCESSES AND PROGRAMS (SPP)

Electrical Characteristics

Filler Metal	Recommended Electrical Conditions							
Type	ER-NiCrMo-3							
Diameter	Amps	Volts	Amps	Volts	Amps	Volts	Amps	Volts
1/16"	70-80	9-11						
Current	Direct							
Polarity	Straight							

Date 11-16-82	Welding
D. K. McConnell	Joint Designs and Electrical Characteristics
Appv'd	WPS No. 04324 Rev. No. 0

Figure #1

PLUG TO TUBE SHEET

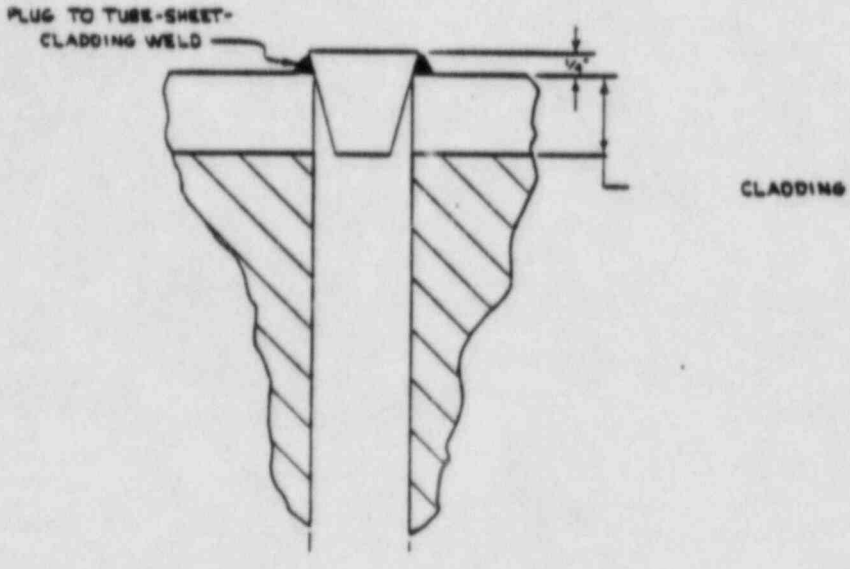
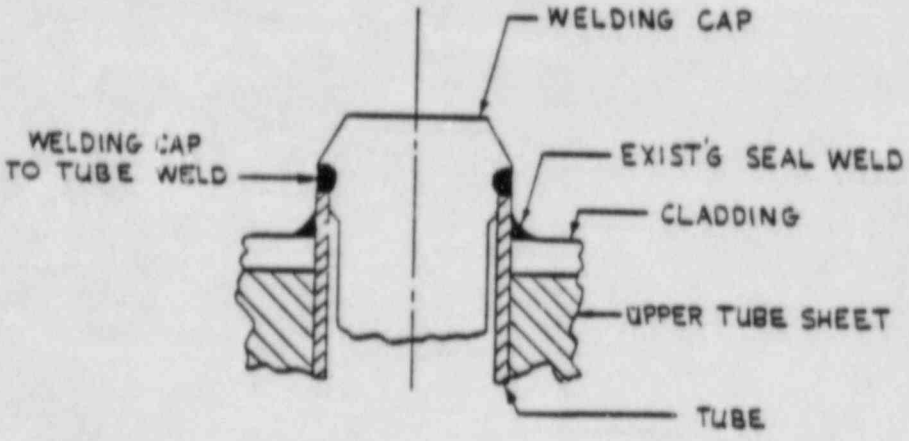


Figure #2

PLUG TO TUBE



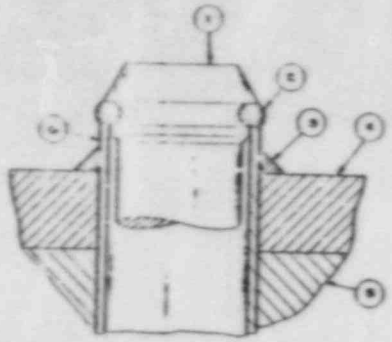


FIG. 1 WELDING CAP
(CONSUMABLE INSERT)

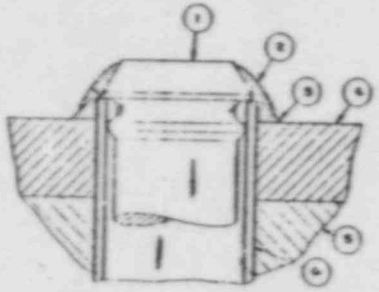


FIG. 2 MODIFIED WELDING CAP
(WITHOUT CONSUMABLE INSERT)

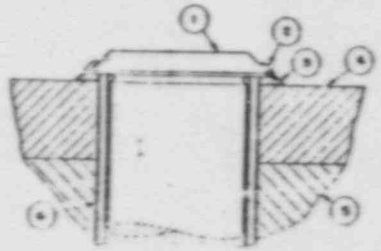


FIG. 3 EXPANDED TUBE WELD CAP

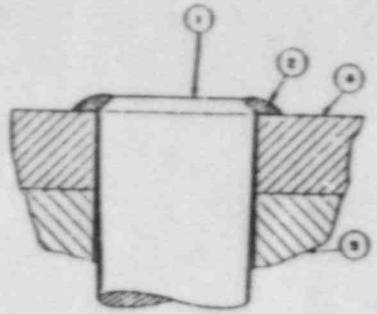


FIG. 4 TAPERED PLUG

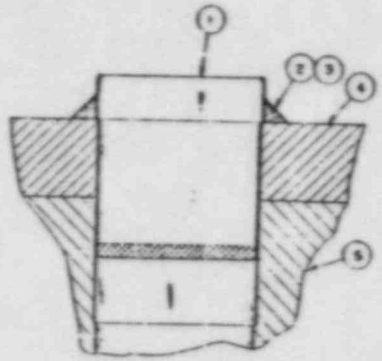


FIG. 5 UPPER TUBESHEET
LANE PLUG
('A' OTSG ONLY)

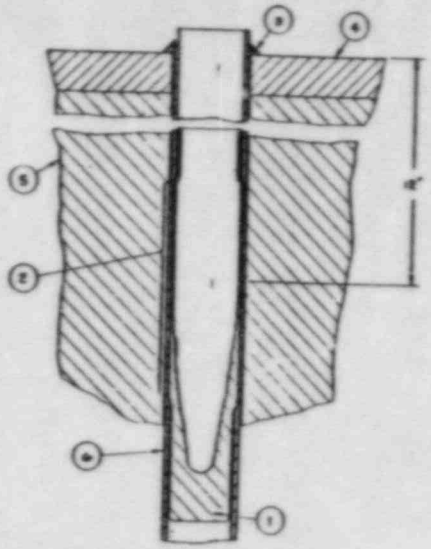


FIG. 6 EXPLOSIVE PLUG

NO.	LEGEND
1	
2	
3	
4	
5	
6	

TYPE PLUG		QUAN	TUBE CONDITION	STAB	WELD MACH HEIGHT ±.06	NEW PLUG WELD SIZE
CURRENT	REPLACEMENT					

TMI-1 OTSG
PLUGGING
CONFIGURATIONS
(UTS)

D

approximately 5 seconds.

6.4.6.5.1 Replace argon bottles when gas gauge pressure is reduced to 25 psi or less.

TECHNIQUES #1 and #2:

6.4.7 There shall be no peening allowed.

6.4.8 The completed weld shall blend smoothly into the adjacent base materials.

6.4.9 Gas: The gas used for shielding shall meet the following requirement.

6.4.9.1 Argon Type.

6.4.9.2 99.99% pure composition

6.4.9.3 Durihg welding a flow rate of 15-20 CFH shall be maintained.

6.4.10 Electrical Characteristics: Electrical characteristics shall meet the following:

6.4.10.1 Current shall be direct current

6.4.10.2 Polarity shall be straight.

6.4.10.3 The Amps and volts ranges shall be covered under the applicable WPS.

6.4.10.4 The travel speed range shall be covered under the applicable WPS.

6.4.11 Filler Materials: The filler materials and size to be used shall be addressed on the applicable WPS/weld record sheet.

6.4.12 Joints: The joint designs to be used are shown on attachments 8.2/8.3 of this procedure and the applicable WPS.

6.5 Inspection:

The following inspection requirements shall be met.

6.5.1 Lighting shall be sufficient enough to distinguish a 1/32" black line on an 18% neutral gray card.

6.5.2 No visual cracks and/or linear indications shall exist in the weld.

6.5.3 No visual porosity and/or blow holes shall exist in the weld.

6.5.4 No visual cold lap shall exist at the points of intersection between the weld and base materials.

6.5.5 Verify the weld is 360° single pass minimum.

6.5.6 Any indication proving to be relevent shall be removed and repaired as outlined in Section 6.6.

6.6 Repair welding shall be as follows:

6.6.1 Grind out defective area using acceptable grinding wheels as outlined in Section 6.3.5.1. Care shall be taken not to grind into intersecting base materials or surrounding tube welds or tube extensions.

6.6.2 Perform visual inspection of grind out to verify defect is removed and that no adjacent tubes or adjacent tubeseal welds were damaged during grinding.

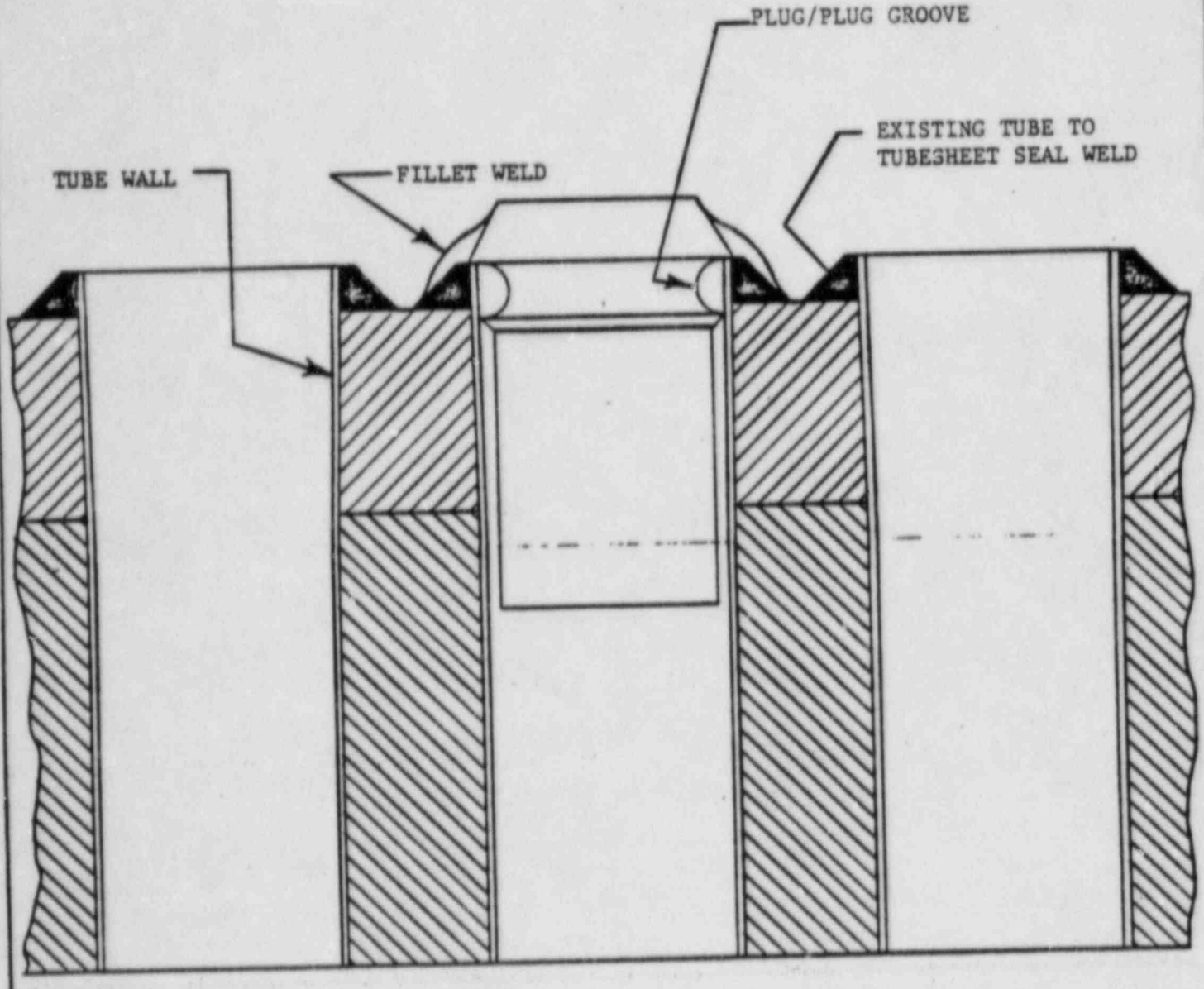
6.6.3 Once defective area has been removed filler material shall be uniformally added as described in Section 6.4.

6.6.4 Upon completion of welding, repaired area shall be visually inspected as described in Section 6.5.

7.0 RECORDS:

7.1 The weld records used to control and document welding shall be considered service life plant records.

FIGURE #4


PLUG/PLUG GROOVE
EXISTING TUBE TO
TUBESHEET SEAL WELD
TUBE WALL
FILLET WELD

THREE MILE ISLAND INFO/UPDATE

PUBLISHED BY COMMUNICATIONS SERVICES

Issue No. Vol. II, No. 50 Phone: 8197 **Date** November 19, 1982

FULL-SCALE TUBE REPAIRS UNDERWAY

Repairs of heat-exchange tubes in the Unit 1 steam generators have begun on a full-scale basis.

As of 2 a.m. November 18, some 7,504 tubes in the "A" steam generator and 10,752 tubes in the "B" steam generator had been repaired through a process known as "kinetic expansion". This process had earlier been qualified and tested both in laboratories and at Unit 1 itself. To date about half of the approximately 31,000 tubes in the two generators have been repaired.

About 200 GPU Nuclear workers will be involved in sealing the tubes against the two-foot thick tubesheet that anchors them at the top of the two generators. The repairs are expected to be completed by year's end.

The kinetic expansion will repair small cracks on the inside of the tubes in the upper tubesheet region. The repairs will enable Unit 1 to be ready to resume operation next year.

WATER BOTTLES MUST BE RETURNED

Island personnel are reminded that the Diamond Spring Water Company bottles used in drinking water dispensers are not throw-away type containers.

GPU Nuclear must pay a deposit on each water bottle. If the bottle is destroyed or damaged, that money is lost. Cutting up these plastic water bottles to make trash containers, or destroying them in some other manner, is misuse of company property and a waste of money.

Please remember that these water bottles are to be reused and are not to be destroyed or damaged.

CHILDREN'S CHRISTMAS PARTY SLATED DECEMBER 11

TMI Recreation Association is hosting its annual Christmas Party for children ages 10 and under of GPU System employees on Saturday, December 11 from 1-3 p.m. at the Middletown American Legion, East High Street.

"JUMP SCHOOL" -- Employees involved in Unit 2 polar crane decontamination and repair work learn the proper use of safety harnesses and rescue techniques during "jump school" exercises in the Unit 2 Turbine Building. Here, the "victim", Bob Kennedy, left, a GPU Nuclear safety administrator, has simulated a fall from the crane and is hanging in midair. His rescuer, John Englick, a Bechtel training engineer, attaches a rescue line to lower the victim safely to the floor. More than 100 employees have participated in such training before working inside the reactor building.

-more-

Activities will include a puppet show, snacks, a gift for each child and balloons.

Deadline for signup is noon, November 24. Reservations can be made by contacting Donna Kent, Ext. 8210; Betty Barb, Ext. 8535; Daughn Silar, Ext. 4014; and Joan Smith, Ext. 8733.

EMPLOYEES CAUTIONED AGAINST TAMPERING WITH PAGE SYSTEM

All TMI employees are cautioned against tampering with the Island's paging system or audible alarms or modifying their operation in any way.

Not only does this interfere with normal Island communications within the plant but can result in a safety problem, particularly when emergency notifications must be made.

Recently it's been discovered that some employees have been muting speakers or alarms by turning them down or by inserting rags or other materials in them.

Any problems or concerns with the operation of the page system should be addressed to the Unit 1 I&C Department at Ext. 8072 or the Unit 2 I&C Department at Ext. 8156.

WELCOME ABOARD!

Beginning with this issue of INFO/UPDATE, a list of new GPU Nuclear employees at TMI will be published on a regular basis.

We welcome employees hired since November 1. They include:

Richard Brill, Project Coordinator Senior-III, Unit 2 Systems Engineering

Roberta Strickler, clerk-junior, Unit 1 Radiological Controls

Bruce Leonard, Engineer-III, Training Department

TMI MIXED BOWLING LEAGUE

Twenty-four Island employees are participating in a mixed bowling league every Thursday night at the Clearview Lanes near Elizabethtown.

Six teams began bowling about six weeks ago and will continue competition into April. INFO/UPDATE will publish league standings on a regular basis. If you'd like more information, contact Jim Stair at Ext. 8477 or Terri Lombardo at Ext. 8497.

Here are the current standings:

TEAM	WON	LOST
EPICOR	15½	8½
SDS	14½	9½
STAs	12½	11½
Rads	10	14
Nukes	10	14
Nuclides	9½	14½

CREDIT UNION CLUB ACCOUNTS PAY SAME HIGH DIVIDENDS

Your Utilities Employees Credit Union is unique in that it pays the same high rate of dividends on club accounts -- currently 9½ percent -- as it does on regular share accounts.

-more-

While the rate of dividends on earnings can fluctuate up or down, your Credit Union has consistently paid higher than average rates.

If you don't already have a club account with the Credit Union, why not ask your local agent, Chris Skinner, Ext. 8453, to open one for you today. Payroll deductions makes it easy.

SPEAKERS BUREAU BUSY IN OCTOBER

The GPU Nuclear Speakers Bureau made 53 presentations to 2,810 people during October. Groups addressed included civic and business organizations, schools and colleges, and engineering and other professional groups.

If you know of a group that would be interested in hearing about TMI or nuclear power topics, contact Jack Thorn at the Visitors Center Public Affairs office, Ext. 8643.

UNIT 1 M&C DIRECTOR TO DISCUSS KINETIC EXPANSION AT ANS MEETING

Unit 1 Maintenance and Construction Director Sandy Levin will discuss how kinetic expansion is being used to repair Unit 1 steam generator tubes at the next meeting of the Central Pennsylvania Section of the American Nuclear Society at TMI.

The meeting is planned for 5 p.m. Tuesday, December 7 at the Training Center, and also will provide an opportunity for prospective new ANS members to learn more about the organization.

Everyone is welcome to stop in and hear an interesting presentation. For more information on membership in ANS, contact Chet Rowe at Ext. 8030.

FRIENDS & FAMILY OFFERS 'TMI STAFF' SHIRTS

Friends and Family of TMI are making available polo shirts with the GPU Nuclear emblem and the words TMI Staff below the emblem to TMI employees. The shirts are 50% polyester and 50% cotton, and come in navy blue, emerald green and bright red. Sizes are small, medium, large, extra large and extra extra large.

John Micka
GPU Nuclear Communications

Lisa Ziegler
Word Processing

-more-

Each shirt will sell for $13. Since they will have to be ordered, Friends and Family will need for you to pay in advance. Allow three weeks for delivery. Please have your orders in by December 6 to receive your shirt before Christmas.

Call Janet Parker ext. 8741, or Sandy Polon ext. 8197, for additional information.

SHIRT ORDER FORM

NUMBER	CIRCLE SIZES (Men's Sizes)				
_____ Navy Blue	S	M	L	XL	XXL
_____ Green	S	M	L	XL	XXL
_____ Red	S	M	L	XL	XXL

Send $13 check for each shirt ordered to:

Janet Parker
Room 109, Unit 2 Administration Building

Make Checks payable to: Friends & Family of TMI
(Purchase is tax deductable)

VAST MAJORITY OF SCIENTISTS ENDORSE NUCLEAR, POLL SAYS

Nuclear energy development enjoys overwhelming support among scientists, contrary to widespread public perceptions that they are sharply divided on the issue.

That's the finding of a randum sampling of the 130,000 scientists listed in "American Men and Women of Science." The survey was undertaken by two researchers, Stanley Rothman and S. Robert Lichter, as part of a study of American social and political trends they are conducting under the auspices of Smith College, Columbia University and George Washington University. The results are reported in the August/September issue of "Public Opinion", a magazine published by the American Enterprise Institute.

More than half (53%) of the scientist polled endorsed rapid development of nuclear energy, and 36% supported slow and cautious development. Only 7% would halt nuclear energy, and only 3% wished to dismantle existing facilities.

Among scientists in energy-related disciplines, moreover, the overwhelming majority (70%) endorsed rapid development. And 92% of scientists in fields related to nuclear energy (including nuclear medicine, radiation genetics, etc.) backed rapid development.

One reason that scientists support nuclear energy is that three-fourths of them regard the energy crisis as "very" or "extremely" serious, the authors say.

Scientists in energy-related disciplines, moreover, "are far less sanguine than the general public about the short-term contribution from solar energy." Only 2% of them believe any form of solar energy will provide a large amount of energy in the next 20 years. By contrast, they rated nuclear fission's potential behind only coal and oil, from among a list of 16 energy options.