Energy Industries of Ohio

Contract # S005242-F

Modular Coil Winding Form

C-1 Documentation Package

3/8/2006

This C-1 MCWF Consists of:

Part 1

Final documentation package
Metal Tek International
Pages 3 – 103
Latest revision – 2-28-06
Foundry documentation

Part 2

Final Documentation Package
Major Tool & Machine, Inc.
Pages 104 – 208
Latest Revision – 1-16-2006
Machine shop documentation

Part 3

Metal Tek radiographic films from Part 1 (shipped to PPPL)

Major Tool radiographic films – none – waived per RFD 14-005

Energy Industries of Ohio

Contract # S005242-F

Modular Coil Winding Forms

C-1 Documentation Package

Part 1 – Metal Tek International
Casting Data Package

10/28/2005

Revised 2-28-06 - updated CA-1323

C-1 Documentation Package

List of Documents 10-4-2005

Doc #	Description	# Pages
A1	Coil C-1 certificate of conformance S73140-1 revised dated 7-21-05	1
A2	Coil C shim certificate of compliance dated 4-29-05	1
A3	Coil C-1 Shim Final Inspection Report dated 7-26-05	1
A4	Dimensional sketch of shim # 141-073 dated 3-31-05	2
A5	Traveler – MTS Coil C shim orig. dated 12-14-04 – signed/dated	6
A6	Radiographic shooting sketch C shim dated 3-10-05	2
A7	Original MTS for C shim dated 12-14-04	6
4a	MTR from MTK post preventive maintenance	1
4b	MTR from Wisconsin Centrifugal	1
5	Chemistry of weld material Lot # 3012668/82743	1
7	Westmoreland tensile test report @ -320F dated 4-19-05	1
8	St Louis Testing tensile test report @ room temperature dated 4-22-05 – corrected 6-15-05	2
8a	St Louis Testing tensile test report @ room temperature –retest of heat 27728 dated 5-12-05	1
8b	St Louis Testing tensile test report @ room temperature –retest of heat 27728 dated 6-1-05	1
9	St Louis Testing charpy test report of heat 27728 @ -320F dated 1-10-05	1
10	St Louis Testing charpy test report of heat 27728 @ room temperature dated 1-10-05	1
11	Westmoreland tensile test of weld material @ -320F dated 4-28-05	1
12	St Louis Testing tensile test of weld material @room temperature dated 4-22-05	1
13	St Louis Testing tensile test of weld material @ -320F dated 4/6/05	1
15	St Louis Testing tensile test of weld material @room temperature dated 2-28-05 – revised 3-2-05	2
16	Weld map list with mag perm results	11
17	Metal Tek final inspection report	1
18	RT reports – X-ray reader sheets from 1-19-05 & 3-19-05	8
18a	Radiographic Technique sheet	17
19	Heat treat chart – dated 12-28-04	1
19a	Heat treat chart stress relief dated 3-5-05	1
20	CA1219 – major welds dated 2-18-05	2
21	CA1226 – thru wall weld dated 2-18-05	2
22	CA1251 – second weld dated 3-22-05	1
22a	CA 1252 – welding – defects discovered during final LP dated 3/24/2005	1
22b	CA 1320 – Lack of test material Dated 7/5/2005	2
23	CA 1300 – test material- lack of ID dated 5-29-05	1
24	CA 1301 – test material lack of direction dated 5-29-05	1
24a	CA 1323 – CA for sulfur & phosphorus readings dated 7/26/05 + addendum dated 8/17/05	5
25	MTS C-1 Coil original dated 12-14-04 includes supplemental routing card on welding dated 3-21-05 – with dated sign-offs	10
26	Shipping release from EIO	1

Carondelet Division

8600 Commercial Blvd. - Pevely, MO 63070 USA
Phone: 636-479-4499 - Fax: 636-479-3399

C-1 Doc Package
Document A-1

Certificate of Conformance

ENERGY INDUSTRIES OF OHIO

Order Number	PPPL-FP-LTS-2		
Pattern	MCWF-C1		
ASTM	CF8MNMN MOD	Revised Date	7/21/2005

Cert Number

S73140-1

Coil C-1, certification number S73140-1 was poured from three ladles known as heat numbers 27728, 27730 and 27731. Heat 27728 is actually a ladle containing material from heats 27728 and 27729. Cast on test bars located in each of the three zones were used for testing purposes. Test reports from St Louis Testing use Heat number 27728 for all test bar samples. Test bars did not have zone identification. Corrective action number 1300 was issued to correct.

Weld repairs were made using approved procedures and Lincoln material LMN 44/55, lot number 3012668/82743.

A shim, certification number S73220-1, for C-1 coil was poured from heat number 27728. No weld repairs were necessary.

We certify that we have complied in accordance with the drawings(s) and specifications(s) listed on the above purchase order. The articles furnished were made and/or processed from parts and/or materials in accordance with all applicable drawings(s) and specifications(s) pursuant to the afore mention purchase order except as noted by corrective actions.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

Carondelet Division

8600 Commercial Blvd. - Pevely, MO 63070 USA
Phone: 636-479-4499 - Fax: 636-479-3399

C-1 Doc Package
Document A-2

Certificate of Conformance

ENERGY INDUSTRIES OF OHIO

Order Number	PPPL-FP-LTS-2		
Pattern	SE-141-073 COIL C SHIM		
Alloy	CF8MNMnMOD	Revised Date	4/29/2005

Cert Number

S73220-1

A shim for C-1 coil was poured from heat number 27728. No weld repairs were necessary. No testing for mechanical properties was performed.

We certify that we have complied in accordance with the drawings(s) and specifications(s) listed on the above purchase order. The articles furnished were made and/or processed from parts and/or materials in accordance with all applicable drawings(s) and specifications(s) pursuant to the afore mention purchase order except as noted by corrective actions.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

C-1 Doc Package
Document A-3

Carondelet Division

8600 Commericial Blvd. - Pevely, MO 63070 USA
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Final Inspection Report

Customer Name: ENERGY INDUSTRIES OF OHIO

Pattern: SE-141-073 COIL C-1 SHIM

Order Number: PPPL-FP-LTS-2

Revised 7/26/05

ASTM Metal CF8MNMN MOD

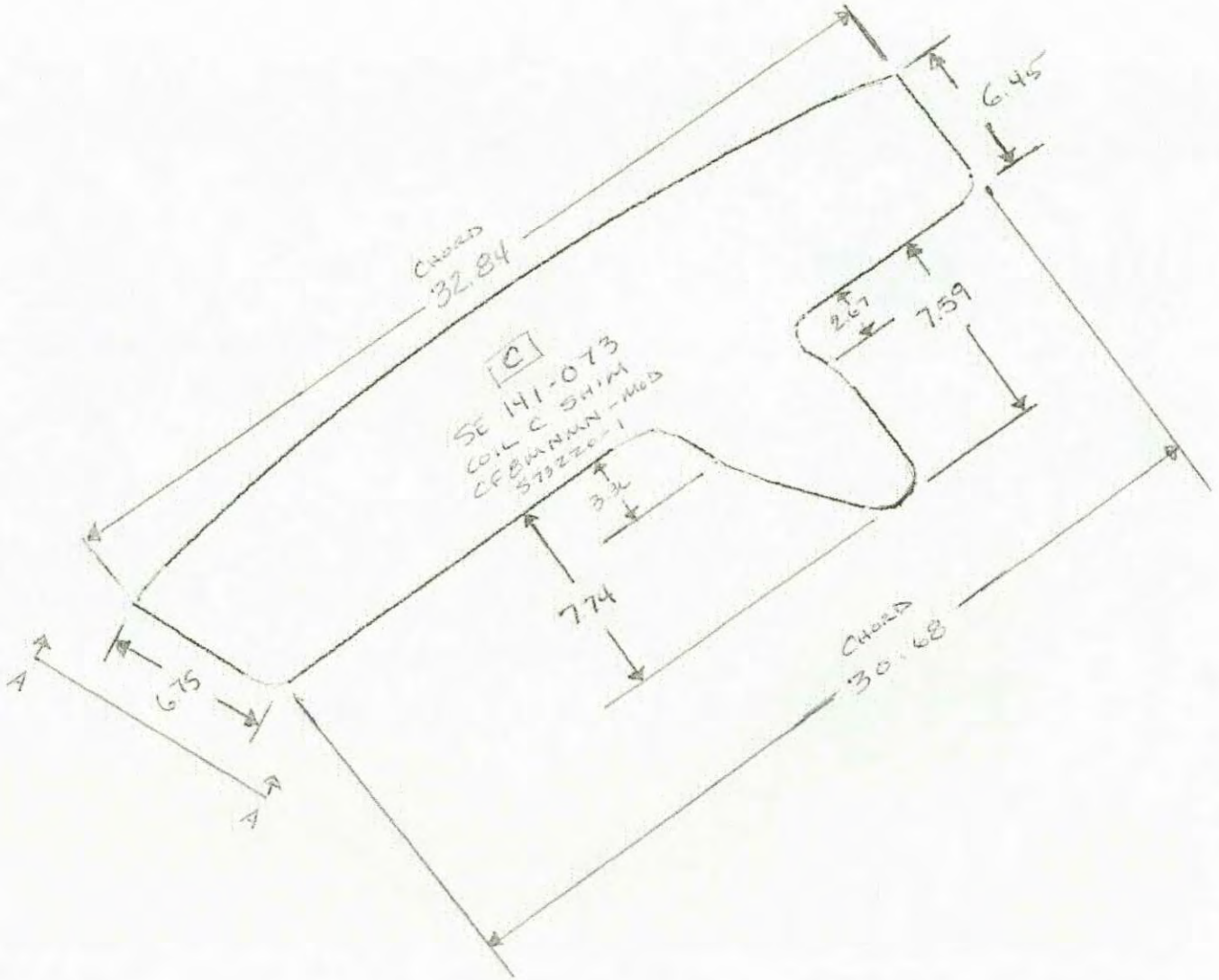
Date 7/26/2005

Type Description	Cert Number	Procedure	Acceptance Criteria	Actual
Liquid Penetrant	S73220-1	CQP - 300 Rev 9	ASTM A903 Level II	Acceptable
Mag Perm	S73220-1	SOP Mag Perm 100 Rev 1	<1.02	Acceptable
Radiographic	S73220-1	CQP - 401 Rev 5	MSS SP 54	Acceptable
Visual	S73220-1	CQP - 500 REV 4	ASTM A802 LEVEL 2	Acceptable

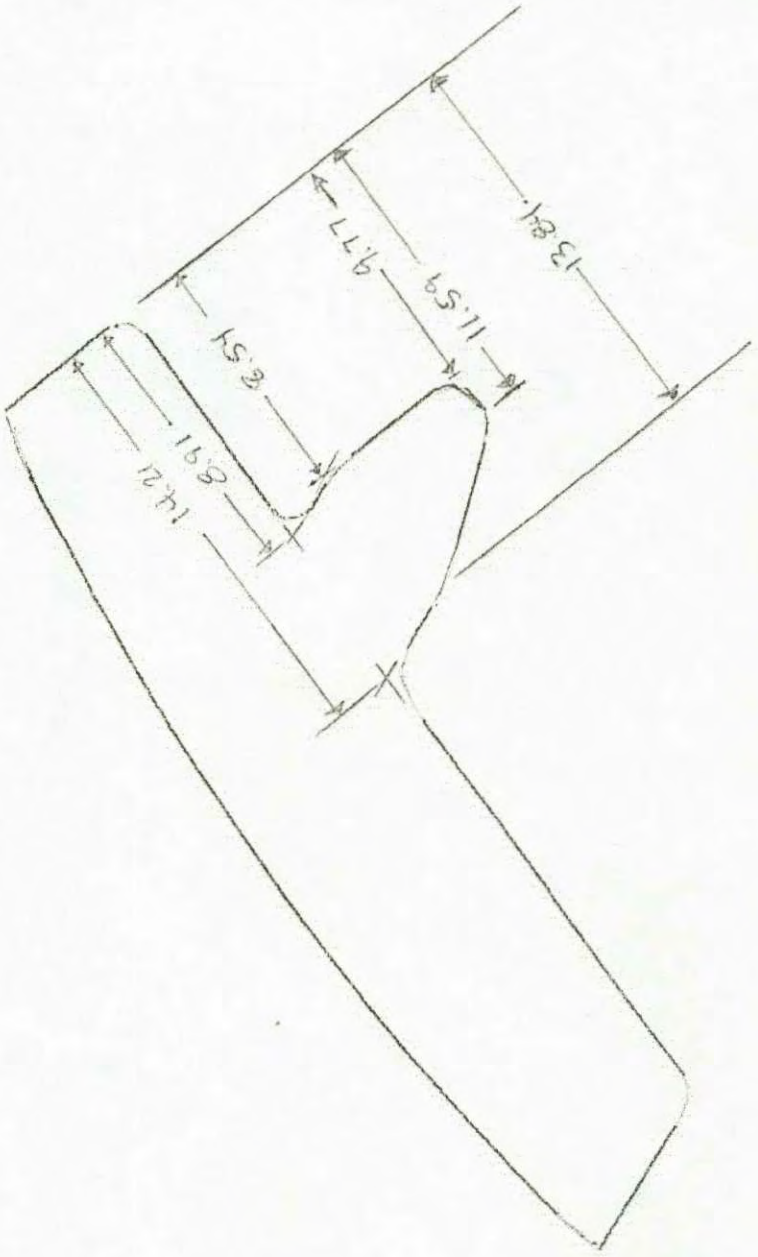
Liquid Penetrant
Technician: Kevin Anderson
ASNT Level II

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

SECT A-A



SHIM SE 141-073
SKETCH 03/31/05
Kevin Hanks



PAGE 2 OF 2
SHIM SE 141-073
SKETCH 03/31/05

420	GRIND GCHI SOP 0100R2	GRIND AREAS OF NON COMPLIANCE AND RETURN TO STEP 420. REPEAT UNTILL COMPLIANCE IS ACHIEVED.	N A	
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF MAG PERM STEP. EIO NOTIFIED ON 3/23/05 DCMA NOTIFIED ON 3/23/05	Q ENG OR QA MGR	
430	FINAL MAG PERM INSPECTION SOP MAG PERM 100, REV 1	PERFORM MAG PERM TESTING WITH SEVRIN GAUGE. ACCEPTANCE 1.02. CHECK THE ENTIRE SURFACE ON A 6"BY6" GRID. REPORT RESULTS. USE A 6" SQUARE BLOCK TO INDICATE TEST LOCATIONS AND RECORD RESULTS. COMPLIANT AREAS WILL NOT BE MARKED. MARK NONCOMPLIANT AREAS WITH AN "X" FOR REPAIR. OK CHECK HERE ____ AND GO TO STEP 470. IF REJECTED CHECK HERE ____.	3/30/05	
440	GRIND GCHI SOP 0100 REV 2	HAND GRIND WITH SUITABLE CONE OR OTHER SIMILAR GRINDER AS REQUIRED TO ENSURE REMOVAL OF MATERIAL TO ACHIEVE MAG PERM REQUIREMENT. CIRCLE AREA REMEDIATE FOR RETEST.	N A	
450	RETEST MAG PERM SOP MAG PERM 100, REV 1	RETEST MAG PERMEABILITY AT FAILED TEST POINTS. MARK NONCOMPLIANT AREAS WITH AN "X" FOR REPAIR. ACCEPTANCE 1.02. IF OK CHECK HERE ____. IF REJECTED CHECK HERE ____ RETURN TO STEP 450		
460	PHOTOGRAPH	TAKE DIGITAL PICTURES. K Harris 3/31/05		
470	AUDIT REVIEW	PROCESS DOCUMENT TO PROGRAM MANAGER FOR COMPLIANCE AUDIT.		3/31/05
480	DOC. REVIEW	REVIEW DOCUMENTS AS REQUIRED IN CAF CHECKLIST, ALL DOCUMENTS NOTED TO BE ACCESSIBLE FOR AUDITING. (SHIPPER, C OF C, M.T.R., M.T.S., INSPECTION REPORT, X-RAY READER SHEETS AND HEAT TREAT CHARTS)		3/31/05
NOTICE	RELEASE FROM EIO	PROVIDE DOCUMENTS TO EIO. SENT ON 3/30 BY ____ RECEIVED RELEASE FROM EIO ON 3/30/05	Q ENG OR QA MGR	
490	PACK AND SHIP	PACKAGE AND SHIP TO MAJOR TOOL.	Shipped	3/31/05
1000	REVISION HISTORY	ORIGINAL 12-14-04.	CARUUD	

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		MUST BE PERFORMED BY LEVEL II in VT.		
330	FINAL L.P. CQP 0300 REV 10	FINAL L.P. 100% OF COMPONENT. ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA- LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING. IF OK CHECK HERE ___✓___ WASH AND SEND TO STEP 410. IF REJECTED CHECK HERE _____	LP - LEVEL II KBA 3-30-05	
340	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING FINAL PENETRANT INSPECTION.	N/A CMA 3-30-05	
350	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903.	LP - LEVEL II	
370	WELD MAP	MAP ALL WELDS WITH DIGITAL PHOTO/MAPS. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE. FILE WITH QA. MUST SEND REPORT ON ALL WELDS OVER 10% OF NOMINAL WALL THICKNESS TO CUSTOMER. NOMINAL WALL THICKNESS TO CUSTOMER. DEFECTS.>10% YES _____, REPORT SENT BY _____ DATE_____ DEFECTS < 10 % _____SIGN BY QA ENG.		
380	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1 FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2		
390	GRIND GCHI SOP 0100 REV 2	HAND GRIND WELDS.		
400	L.P. WELDS CQP 0300 REV 10	L.P. WELD REPAIRS ACCEPTANCE PER ASTM A903. IF OK CHECK HERE _____ WASH AND SEND TO STEP 460. IF REJECTED CHECK HERE _____AND RETURN TO STEP 390.	LP - LEVEL II	
	REPEAT	REPEAT STEPS ___390 TO 410____ AS REQUIRED TILL WELDS CLEAR FINAL LIQUID PENETRANT INSPECTION. DOCUMENT REWORK ON A SUPPLEMENTAL MTS	QA ENG.	
410	TEST MAG PERM SOP MAG PERM 100, REV 1	TEST MAG PERMEABILITY REPAIR AREAS. RECORD ON WELD MAP LIST. TEST AT LEAST 5 POINTS PER WELD. ACCEPTANCE 1.02. IF OK CHECK HERE _____AND GO TO STEP 430.	NA	

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260	L.P. WELD CQP 0300 REV 10	L.P. WELD REPAIRS ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA-LEVEL 2. IF OK CHECK HERE _____ WASH AND SEND TO STEP 300. IF REJECTED CHECK HERE _____AND RETURN TO STEP 220.	LP - LEVEL II	NA
	REPEAT	REPEAT STEPS __220 TO 260___AS REQUIRED TILL CLEAR THROUGH VISUAL INSPECTION & PENETRANT INSPECTION. DOCUMENT REWORK ON A SUPPLEMENTAL MTS	QA ENG.	
270	TEST MAG PERM SOP MAG PERM 100, REV 1	TEST MAG PERMEABILITY REPAIR AREAS RECORD ON WELD MAP LIST. TEST AT LEAST 5 POINTS PER WELD. ACCEPTANCE 1.02. IF OK CHECK HERE _____AND GO TO STEP 290. IF REJECTED CHECK HERE _____.		
280	GRIND GCHI SOP 0100R2	GRIND AREAS OF NON COMPLIANCE AND RETURN TO STEP 270. REPEAT UNTILL COMPLIANCE IS ACHIEVED.		
290	CAF X-RAY DEFECTS REPAIRED BY WELDING CQP 401 REV 5	X-RAY PER TECHNIQUE: To be determined. USE CALIBRATED DENSITOMETER FOR DENSITY VERIFICATION. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET.	RT - LEVEL II	
300	X-RAY CQP 401 REV 5	X-RAY INTERPRETATION. ACCEPTANCE MSS SP 54. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET. IF OK CHECK HERE _____ AND SEND TO STEP 310. REJECTED CHECK HERE _____ MARK UP DEFECTS AND SEND THE CASTING TO STEP 200.	RT - LEVEL II	
	REPEAT	REPEAT STEPS __200 TO 300___AS REQUIRED TILL WELDS CLEAR X-RAY. DOCUMENT REWORK ON A SUPPLEMENTAL MTS	QA ENG.	
310	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.		NA
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF VISUAL AND LP STEPS. EIO NOTIFIED ON 3/23/05 DCMA NOTIFIED ON 3/23/05	Q ENG OR QA MGR	
320	FINAL VISUAL INSPECTION CQP-500 REV 4	VISUALLY INSPECT 100% of COMPONENT ACCORDING TO ASTM A802 LEVEL 2 ALL CONDITIONS. IF OK CHECK HERE ✓. IF REJECTED CHECK HERE _____. MARK AND REPAIR AT STEP 340.	VT - LEVEL II Ricardo Sivia	3/30/04

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170	CAF X-RAY CQP 401 REV 5	X-RAY PER TECHNIQUE: To be determined. USE CALIBRATED DENSITOMETER FOR DENSITY VERIFICATION. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET.	RT - LEVEL II RBK	3-10-05
180	X-RAY CQP 401 REV 5	X-RAY INTERPRETATION. ACCEPTANCE MSS SP 54. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET. IF OK CHECK HERE ✓ AND SEND TO STEP ~~310~~ 190 then to 310 ok REJECTED CHECK HERE _____ MARK UP DEFECTS AND SEND THE CASTING TO STEP 200.	RT – LEVEL II RBK	3-10-05
190	LAYOUT	INSPECT CASTING TO VERIFY DIMENSIONS. THIS MAY BE PERFORMED BEFORE OR AFTER STEP 180. NO B/P AVAILABLE MADE ROUGH SKETCH DIMENSIONED _____ DATE _____ RELEASED _____(ENGINEER ONLY)		3/31/05
200	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING RADIOGRAPHY.	NA	
210	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903. ACCEPTANCE CRITERIA- LEVEL 2.	LP - LEVEL II	
220	WELD MAP	MAP ALL WELDS WITH DIGITAL PHOTO/MAPS. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE, FILE WITH QA.. MUST SEND REPORT ON ALL WELDS OVER 10% OF NOMINAL WALL THICKNESS TO CUSTOMER. DEFECTS>10% YES _____, REPORT SENT BY _____ DATE_____ DEFECTS < 10 % _____ SIGN BY QA ENG.		
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF WELD STEP. EIO NOTIFIED ON _____ DCMA NOTIFIED ON _____	Q ENG OR QA MGR	
230	QA APPROVAL HOLD POINT	QA TO APPROVE ELECTRODE PRIOR TO USE. PROCEDURE USED: _____ MATERIAL USED:_____ _____ QUALITY ENG. Name: _____ Date: _____		
240	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1 FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2		
250	GRIND GCHI SOP 0100R2	HAND GRIND WELDS.		

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90	GRIND GSWA SOP 0100R3 GCHI SOP 0100R2	SWING GRIND TO REMOVE RISER REMAINS AND FLASH IF REQUIRED. CHIP AND HAD GRIND SURFACE OF PART AS REQUIRED.	MB.G	1-09-05
100	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.	MTW	1-7/05
110	VISUAL INSPECTION CQP-500 REV 4	VISUALLY INSPECT 100% of COMPONENT ACCORDING TO ASTM A802 LEVEL 3 ALL CONDITIONS. IF OK CHECK HERE _____. IF REJECTED CHECK HERE X. MARK AND REPAIR AT STEP 130.	VT - LEVEL II	1-7-05
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF LP STEP. EIO NOTIFIED ON 1/3/05 DCMA NOTIFIED ON 1/3/05 again on 1/4/05 for as early as 1/7/05	Q ENG OR QA MGR	
120	100% L.P. CQP 0300 REV 10	L.P. 100% OF COMPONENT. ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA- LEVEL 2. IF OK CHECK HERE _____ IF REJECTED CHECK HERE X MARK AND REPAIR AT STEP ~~120~~ 130 end.	LP - LEVEL II	1/7/05
130	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING 100% VISUAL AND LP INSPECTION. DEFECTS GROUND ON ONLY NO WELDING REQUIRED		3/9/05
140	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903. ACCEPTANCE CRITERIA- LEVEL 2.	LP - LEVEL II	N/A ↓
150	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.	MTW	3/9/05
160	WELD MAP	MAP ALL WELDS WITH DIGITAL PHOTO/MAPS. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE, FILE WITH QA.. USE YELLOW MARKER. MUST SEND REPORT ON ALL WELDS OVER 10% OF NOMINAL WALL THICKNESS TO CUSTOMER. DEFECTS>10% YES _____, REPORT SENT BY _____ DATE_____ DEFECTS < 10 % _____SIGN BY QA ENG.	N/A ↓	↓
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF XRAY AND LAYOUT STEPS. EIO NOTIFIED ON 3/9/05 DCMA NOTIFIED ON 3/9/05	Q ENG OR QA MGR	

1/7/04

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Document A5

Energy Industries of Ohio
Manufacturing and Test Sequence (MTS) Coil C Shim-1

CO# 40851, Pattern SE 141-073 S73220-1 Dated December 14, 2004 Revision:Original **Dated Issued:12-14-04**

OPER. #	STATION	DESCRIPTION OF PROCESS	Name	Date
10	QUALITY RELEASE	REVIEW AND APPROVE MTS. RECEIVED APPROVAL FROM EIO ON 12/15/04 FROM ~~Pete~~ SIGNED QUALITY MANAGER	CAK	12/15/04
20	PATTERN NPAT SOP 0100REV2	APPLY APPROPRIATE PART NUMBER, SERIAL NUMBER, FOUNDRY MARK, TO THE PATTERN.	[illegible]	12/17
30	MOLD MOLD SOP 0400 REV 8 CALIBRATION PER MOLD SOP 0900 REV 5 PREPARATION PER MOLD SOP 1100R2/1200R2/1300R1 SAND TESTING PER MOLD SOP 1400R2/1500R3/1600R2	MOLD PER WORK INSTRUCTIONS IN MAPICS ROUTING AND SOPS REFERENCED. ENGINEER OF RECORD ROGER BROMAN, CONSULT ON MOLD-RELATED CONCERNS. MOLD MATERIALS REQUIRED PER MAPICS BOM. NOTIFY ENGINEER OF ANY SUBSTITUTIONS.	[illegible]	12-17-04
40	POUR MELT SOP 0100R5 MELT SOP 0700R2 MELT SOP 0600R2	METAL MUST BE AOD REFINED OR AOD INGOT. VIRGIN METAL ADDITIONS ALLOWED. RECORD POURING TEMPERATURE: 2830 CASTING POURED AT: 5:36 Am DATE: 12/19/04 HEAT #'s: 27728, 27729, 27730, 27731 ELAPSED POUR TIME N/A CAK KEEL BLOCKS POURED: YES Sample from ladle to be analyzed for final chemical analysis and reported on material certifications. Sample Taken by: JG Analyzed: J. Galaska Date: 12-19-04	[illegible]	[illegible]
50	MELT SOP 0800R2	SHAKEOUT	BR	12-21-04
60	ARC RISE SOP 0100R1	REMOVE RISERS AS DIRECTED BY SUPERVISOR.	ZAB	12-21-04
70	HEAT TREAT HEAT SOP 0103R5	SOLUTION ANNEAL. With C-1 Coil. 2050° HOLD FS-1	DCS	12/28/04
80	PHYSICAL TESTING	OBTAIN TEST SPECIMENS AND SUBMIT FOR PHYSICAL TESTING. REPORT RESULTS AS PART OF STEP 480.	WH	12/28/04

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Document A5

Metal INTERNATIONAL

C-1 Doc Package
Document A6

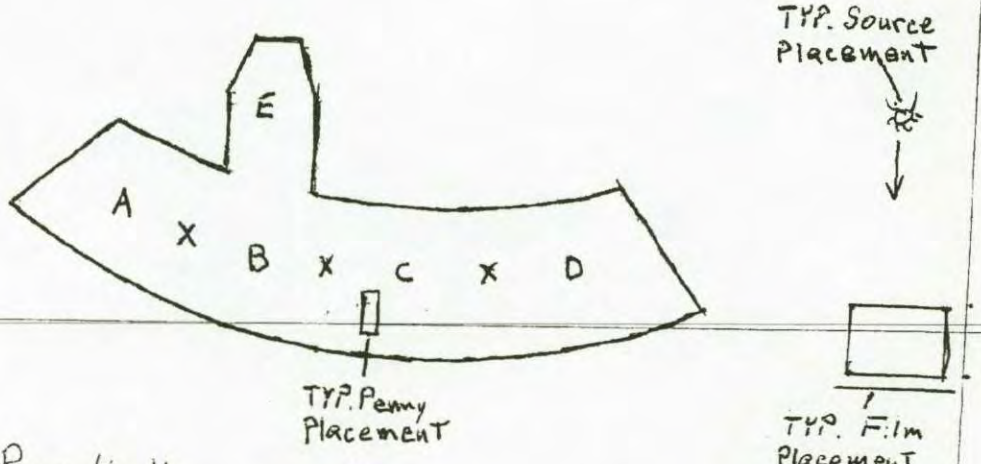
RADIOGRAPHIC STANDARD SHOOTING SKETCH

Customer Energy Industries of Ohio	Pattern Number SE-141-073
Material CF8MNMN-MOD	Traceability Number MS73220
Film Manufactuer FUJI	Source Number CO60 24.7 CI
IQI LEVEL 2-2T From CQP 401 X Other (Specify, E.G. 2-4T, 2-1T) N/A	

Exposures (views)	A	B	C	D	E
Thickness (IN.)	3 3/8"	→	→	→	→
S/F Distance (IN.)	24"	→	→	→	→
Penetrameter	50	→	→	→	→
Time (MIN.)	Calculate	→	→	→	→
Focal Spot (IN.)	.1	→	→	→	→
Film Size (IN.)	14X17	→	→	→	→
Screen Size (Pb) Front/Back	.01	→	→	→	→
S.W.E./D.W.E.	SWE	→	→	→	→
S.W.V/D.W.V.	SWV	→	→	→	→
Film Type	80	→	→	→	→
Acceptance Standard	E186	→	→	→	→
Severity Level	III	→	→	→	→

Shooting Sketch (Use Additional Pages as Needed)

use Spec. MSS-SP-54



Technique Prepared By: Roy Kelley Level: II Date: 3-10-05

Technique Approved By: [signature] Level: III Date: 3-10-05

S:DRIVE/MANUAL FORMS/RADIOGRAPHY
RSS-01 REV. 4 2/9/02

MetalTek INTERNATIONAL

C-1 Doc Package
Document A6

RADIOGRAPHIC INTERPRETATION REPORT

CUSTOMER	PURCHASE ORDER NUMBER	DATE	CONTROL NO.	PAGE
Energy Industries of Ohio	28030003	3-4-05	40E51	1 of 1

PART NO.	SPECIFICATION	CLASS	TOTAL PIECES	PIECES ACCEPTED
SE-141-073	MSS-SP-54	See Spec	1	1

RADIOGRAPHED BY:	INTERPRETED BY:	ASNT LEVEL
[illegible]	[illegible]	II

FILM TYPE	MATERIAL	ISOTOPE	CODE
FUJI 80	CF8MNMN-Mod	IRIDIUM 192 COBALT 60 ✓	ASTM E94 ✓ ASME MIL-STD-453

MS73220	VIEW	PENE	ACCEPT	REJECT	SHRINK	INCLUSION	POROSITY	LINEAR	SURFACE	LOF/LOP	COMMENTS
RT-1	A	50	/								
	B		/								
	C		/						/		
	D		/								
	E		/						/		

S:DRIVE/MANUAL FORMS/RADIOGRAPHY
RIR-01 REV. 0 6/9/03

FORM QC034

260	L.P. WELD CQP 0300 REV 10	L.P. WELD REPAIRS ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA-LEVEL 2. IF OK CHECK HERE _____ WASH AND SEND TO STEP 300. IF REJECTED CHECK HERE _____AND RETURN TO STEP 220.	LP - LEVEL II	
	REPEAT	REPEAT STEPS __220 TO 260___AS REQUIRED TILL CLEAR THROUGH VISUAL INSPECTION & PENETRANT INSPECTION. DOCUMENT REWORK ON A SUPPLEMENTAL MTS	QA ENG.	
270	TEST MAG PERM SOP MAG PERM 100, REV 1	TEST MAG PERMEABILITY REPAIR AREAS RECORD ON WELD MAP LIST. TEST AT LEAST 5 POINTS PER WELD. ACCEPTANCE 1.02. IF OK CHECK HERE _____AND GO TO STEP 290. IF REJECTED CHECK HERE _____.		
280	GRIND GCHI SOP 0100R2	GRIND AREAS OF NON COMPLIANCE AND RETURN TO STEP 270. REPEAT UNTILL COMPLIANCE IS ACHIEVED.		
290	CAF X-RAY DEFECTS REPAIRED BY WELDING CQP 401 REV 5	X-RAY PER TECHNIQUE: To be determined. USE CALIBRATED DENSITOMETER FOR DENSITY VERIFICATION. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET.	RT - LEVEL II	
300	X-RAY CQP 401 REV 5	X-RAY INTERPRETATION. ACCEPTANCE MSS SP 54. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET. IF OK CHECK HERE _____ AND SEND TO STEP 310. REJECTED CHECK HERE _____ MARK UP DEFECTS AND SEND THE CASTING TO STEP 200.	RT - LEVEL II	
	REPEAT	REPEAT STEPS __200 TO 300___AS REQUIRED TILL WELDS CLEAR X-RAY. DOCUMENT REWORK ON A SUPPLEMENTAL MTS	QA ENG.	
310	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.		
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF VISUAL AND LP STEPS. EIO NOTIFIED ON _____ DCMA NOTIFIED ON _____	Q ENG OR QA MGR	
320	FINAL VISUAL INSPECTION CQP-500 REV 4	VISUALLY INSPECT 100% of COMPONENT ACCORDING TO ASTM A802 LEVEL 2 ALL CONDITIONS. IF OK CHECK HERE _____. IF REJECTED CHECK HERE _____. MARK AND REPAIR AT STEP 340.	VT - LEVEL II	

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170	CAF X-RAY CQP 401 REV 5	X-RAY PER TECHNIQUE: To be determined. USE CALIBRATED DENSITOMETER FOR DENSITY VERIFICATION. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET.	RT - LEVEL II	
180	X-RAY CQP 401 REV 5	X-RAY INTERPRETATION. ACCEPTANCE MSS SP 54. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET. IF OK CHECK HERE _____ AND SEND TO STEP 310. REJECTED CHECK HERE _____ MARK UP DEFECTS AND SEND THE CASTING TO STEP 200.	RT – LEVEL II	
190	LAYOUT	INSPECT CASTING TO VERIFY DIMENSIONS. THIS MAY BE PERFORMED BEFORE OR AFTER STEP 180. DIMENSIONED _____ DATE _____ RELEASED _____(ENGINEER ONLY)		
200	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING RADIOGRAPHY.		
210	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903. ACCEPTANCE CRITERIA- LEVEL 2.	LP - LEVEL II	
220	WELD MAP	MAP ALL WELDS WITH DIGITAL PHOTO/MAPS. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE, FILE WITH QA.. MUST SEND REPORT ON ALL WELDS OVER 10% OF NOMINAL WALL THICKNESS TO CUSTOMER. DEFECTS>10% YES _____, REPORT SENT BY _____ DATE_____ DEFECTS < 10 % _____SIGN BY QA ENG.		
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF WELD STEP. EIO NOTIFIED ON _____ DCMA NOTIFIED ON _____	Q ENG OR QA MGR	
230	QA APPROVAL HOLD POINT	QA TO APPROVE ELECTRODE PRIOR TO USE. PROCEDURE USED: _____ MATERIAL USED:_____ QUALITY ENG. Name: _____ Date: _____		
240	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1 FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2		
250	GRIND GCHI SOP 0100R2	HAND GRIND WELDS.		

90	GRIND GSWA SOP 0100R3 GCHI SOP 0100R2	SWING GRIND TO REMOVE RISER REMAINS AND FLASH IF REQUIRED. CHIP AND HAD GRIND SURFACE OF PART AS REQUIRED.		
100	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.		
110	VISUAL INSPECTION CQP-500 REV 4	VISUALLY INSPECT 100% of COMPONENT ACCORDING TO ASTM A802 LEVEL 3 ALL CONDITIONS. IF OK CHECK HERE _____. IF REJECTED CHECK HERE ____. MARK AND REPAIR AT STEP 130.	VT - LEVEL II	
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF LP STEP. EIO NOTIFIED ON _____ DCMA NOTIFIED ON _____	Q ENG OR QA MGR	
120	100% L.P. CQP 0300 REV 10	L.P. 100% OF COMPONENT. ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA- LEVEL 2. IF OK CHECK HERE _____ IF REJECTED CHECK HERE _____ MARK AND REPAIR AT STEP 120.	LP - LEVEL II	
130	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING 100% VISUAL AND LP INSPECTION.		
140	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903. ACCEPTANCE CRITERIA- LEVEL 2.	LP - LEVEL II	
150	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.		
160	WELD MAP	MAP ALL WELDS WITH DIGITAL PHOTO/MAPS. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE, FILE WITH QA.. USE YELLOW MARKER. MUST SEND REPORT ON ALL WELDS OVER 10% OF NOMINAL WALL THICKNESS TO CUSTOMER. DEFECTS>10% YES _____, REPORT SENT BY _____ DATE_____ DEFECTS < 10 % _____SIGN BY QA ENG.		
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF XRAY AND LAYOUT STEPS. EIO NOTIFIED ON _____ DCMA NOTIFIED ON _____	Q ENG OR QA MGR	

Energy Industries of Ohio
Manufacturing and Test Sequence (MTS) Coill C Shim-1
CO# 40851, Pattern SE 141-073 S73220-1 Dated December 14, 2004 Revision:Original **Dated Issued:12-14-04**

OPER. #	STATION	DESCRIPTION OF PROCESS	Name	Date
10	QUALITY RELEASE	REVIEW AND APPROVE MTS. RECEIVED APPROVAL FROM EIO ON _____ FROM _____ SIGNED QUALITY MANAGER		
20	PATTERN NPAT SOP 0100REV2	APPLY APPROPRIATE PART NUMBER, SERIAL NUMBER, FOUNDRY MARK, TO THE PATTERN.		
30	MOLD MOLD SOP 0400 REV 8 CALIBRATION PER MOLD SOP 0900 REV 5 PREPARATION PER MOLD SOP 1100R2/1200R2/1300R1 SAND TESTING PER MOLD SOP 1400R2/1500R3/1600R2	MOLD PER WORK INSTRUCTIONS IN MAPICS ROUTING AND SOPS REFERENCED. ENGINEER OF RECORD – ROGER BROMAN, CONSULT ON MOLD-RELATED CONCERNS. MOLD MATERIALS REQUIRED PER MAPICS BOM. NOTIFY ENGINEER OF ANY SUBSTITUTIONS.		
40	POUR MELT SOP 0100R5 MELT SOP 0700R2 MELT SOP 0600R2	METAL MUST BE AOD REFINED OR AOD INGOT. VIRGIN METAL ADDITIONS ALLOWED. RECORD POURING TEMPERATURE: _____ CASTING POURED AT: _____ DATE: _____ HEAT #`s: _____ ELAPSED POUR TIME_____ KEEL BLOCKS POURED: _____ Sample from ladle to be analyzed for final chemical analysis and reported on material certifications. Sample Taken by:_____ Analyzed: _____Date: _____		
50	MELT SOP 0800R2	SHAKEOUT		
60	ARC RISE SOP 0100R1	REMOVE RISERS AS DIRECTED BY SUPERVISOR.		
70	HEAT TREAT HEAT SOP 0103R5	SOLUTION ANNEAL. With C-1 Coil.		
80	PHYSICAL TESTING	OBTAIN TEST SPECIMENS AND SUBMIT FOR PHYSICAL TESTING. REPORT RESULTS AS PART OF STEP 480.		

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420	GRIND GCHI SOP 0100R2	GRIND AREAS OF NON COMPLIANCE AND RETURN TO STEP 420. REPEAT UNTILL COMPLIANCE IS ACHIEVED.		
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF MAG PERM STEP. EIO NOTIFIED ON _____ DCMA NOTIFIED ON _____	Q ENG OR QA MGR	
430	FINAL MAG PERM INSPECTION SOP MAG PERM 100, REV 1	PERFORM MAG PERM TESTING WITH SEVRIN GAUGE. ACCEPTANCE 1.02. CHECK THE ENTIRE SURFACE ON A 6"BY6" GRID. REPORT RESULTS. USE A 6" SQUARE BLOCK TO INDICATE TEST LOCATIONS AND RECORD RESULTS. COMPLIANT AREAS WILL NOT BE MARKED. MARK NONCOMPLIANT AREAS WITH AN "X" FOR REPAIR. OK CHECK HERE ____AND GO TO STEP 470. IF REJECTED CHECK HERE _____.		
440	GRIND GCHI SOP 0100 REV 2	HAND GRIND WITH SUITABLE CONE OR OTHER SIMILAR GRINDER AS REQUIRED TO ENSURE REMOVAL OF MATERIAL TO ACHIEVE MAG PERM REQUIREMENT. CIRCLE AREA REMEDIATE FOR RETEST.		
450	RETEST MAG PERM SOP MAG PERM 100, REV 1	RETEST MAG PERMEABILITY AT FAILED TEST POINTS. MARK NONCOMPLIANT AREAS WITH AN "X" FOR REPAIR. ACCEPTANCE 1.02. IF OK CHECK HERE _____. IF REJECTED CHECK HERE _____RETURN TO STEP 450		
460	PHOTOGRAPH	TAKE DIGITAL PICTURES.		
470	AUDIT REVIEW	PROCESS DOCUMENT TO PROGRAM MANAGER FOR COMPLIANCE AUDIT.		
480	DOC. REVIEW	REVIEW DOCUMENTS AS REQUIRED IN CAF CHECKLIST, ALL DOCUMENTS NOTED TO BE ACCESSIBLE FOR AUDITING. (SHIPPER, C OF C, M.T.R., M.T.S., INSPECTION REPORT, X-RAY READER SHEETS AND HEAT TREAT CHARTS)		
NOTICE	RELEASE FROM EIO	PROVIDE DOCUMENTS TO EIO. SENT ON _____ BY _____. RECEIVED RELEASE FROM EIO ON _____.	Q ENG OR QA MGR	
490	PACK AND SHIP	PACKAGE AND SHIP TO MAJOR TOOL.		
1000	REVISION HISTORY	ORIGINAL 12-14-04.	CARUUD	

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		MUST BE PERFORMED BY LEVEL II in VT.		
330	FINAL L.P. CQP 0300 REV 10	FINAL L.P. 100% OF COMPONENT. ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING. IF OK CHECK HERE _____ WASH AND SEND TO STEP 410. IF REJECTED CHECK HERE _____	LP - LEVEL II	
340	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING FINAL PENETRANT INSPECTION.		
350	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903.	LP - LEVEL II	
370	WELD MAP	MAP ALL WELDS WITH DIGITAL PHOTO/MAPS. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE. FILE WITH QA. MUST SEND REPORT ON ALL WELDS OVER 10% OF NOMINAL WALL THICKNESS TO CUSTOMER. NOMINAL WALL THICKNESS TO CUSTOMER. DEFECTS.>10% YES _____, REPORT SENT BY _____ DATE_____ DEFECTS < 10 % _____SIGN BY QA ENG.		
380	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1 FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2		
390	GRIND GCHI SOP 0100 REV 2	HAND GRIND WELDS.		
400	L.P. WELDS CQP 0300 REV 10	L.P. WELD REPAIRS ACCEPTANCE PER ASTM A903. IF OK CHECK HERE _____ WASH AND SEND TO STEP 460. IF REJECTED CHECK HERE _____AND RETURN TO STEP 390.	LP - LEVEL II	
	REPEAT	REPEAT STEPS ___390 TO 410____AS REQUIRED TILL WELDS CLEAR FINAL LIQUID PENETRANT INSPECTION. DOCUMENT REWORK ON A SUPPLEMENTAL MTS	QA ENG.	
410	TEST MAG PERM SOP MAG PERM 100, REV 1	TEST MAG PERMEABILITY REPAIR AREAS. RECORD ON WELD MAP LIST. TEST AT LEAST 5 POINTS PER WELD. ACCEPTANCE 1.02. IF OK CHECK HERE _____AND GO TO STEP 430.		

MetalTek INTERNATIONAL

Carondelet Division

8600 Commercial Blvd. - Pevely, MO 63070 USA
Phone: 636-479-4499 - Fax: 636-479-3399

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Document #4a

Material Test Report

Replaced by product analysis - See CA1323

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C1
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD

Cert Number S73140-1
Pour Date 12/19/2004

Weighted average of 3 heats – 27728(32.4%), 27730(25.1%), 27731(42.5%) Total Weight 28779 lbs.

Revised 9/15/05

Element	Min	Actual	Max
C	0.04	0.06	0.07
MN	2.3	2.7	2.8
SI	0.0	0.5	0.7
CR	18.0	18.1	18.5
NI	13.0	13.1	13.5
MO	2.1	2.2	2.5
P*	0.0	0.018	0.035
S*	0.0	0.014	0.025
N	0.24	0.27	0.28

*P & S taken from cast on bar and analyzed by wet chemistries, ASTM E1019-03 for sulfur and Colormetric for phosphorous.

PRODUCT ANALYSIS

Results of spectrometer analysis of cast on test bar after spectrometer preventive maintenance performed.

Element	
C	***
MN	1.9
SI	0.7
CR	18.3
NI	13.2
MO	2.4
P	0.024
S	0.013
N	***

***Not analyzed on spectrograph.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

MetalTek INTERNATIONAL

Carondelet Division

8600 Commercial Blvd. - Pevely, MO 63070 USA
Phone: 636-479-4499 - Fax: 636-479-3399

C-1 Doc Package
Document # 4b

Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C1
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD
Analysis performed by Wisconsin Centrifugal

Cert Number S73140-1
Pour Date 12/19/2004

Revised 10-19-05

Element	Min	Actual	Max
C	0.04	0.06	0.07
MN*	2.3	1.8	2.8
SI	0.0	0.7	0.7
CR	18.0	18.3	18.5
NI	13.0	13.4	13.5
MO	2.1	2.4	2.5
P	0.0	0.021	0.035
S	0.0	0.014	0.025
N	0.24	0.24	0.28

- See Corrective Action Number 1323

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

PRODUCT CONFORMANCE REPORT

LINCOLN ELECTRIC

Product	LNM 4455	Size(s) mm	1,2
Class.	EN 12072-99: G 20 16 3 Mn L	Lot/Batch	3012668/82743
		Item No.	692129

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Document # 5

Customer	CK SUPPLY Contact Ernie Simpson Eureka (MISSOURI) 63025 UNITED STATES	Quantity	
		Customer ref.	P.O.: SL056508
		LSW Order No.	SD418352

Chemical analysis (%) EN10204 3.1B

C	Si	Mn	P	S	Cr	Ni	Mo	Cu	N
0,02	**0,4**	**7,2**	**0,014**	**0,003**	**19,6**	**15,7**	**2,7**	**0,1**	**0,17**

Can't read that high I.G.

Mechanical tests, all weld metal EN10204

Additional information EN10204
Other tests

Remarks

The product identified above has been manufactured, tested and supplied in compliance with a Quality Assurance Programme that fulfils the requirements of EN 29000/ ISO 9000/BS 5750 or similar standard.
We herewith certify that the product complies with the above-mentioned standards.
Certified ISO 9001:2000

Company	Issued by	Function	Date	Cert. No.
Lincoln Smitweld B.V.	**P. van Etteger**	**QS Manager**	**27/01/2005**	**3012668/8274**

Registered Office / *Visiting address* / *Telephone* / *Fax*
Mercuriusweg 29 / *P.O. Box 253* / 31 24 3522911 / 31 24 3522200
6534 AD NIJMEGEN / *6501 AG Nijmegen*
NETHERLANDS

Westmoreland Mechanical Testing & Research, Inc.
P.O. Box 388
Westmoreland Drive
Youngstown, PA 15696-0388 U.S.A.
Telephone: 724-537-3131 Fax: 724-537-3151
Website: www.wmtr.com
WMT&R is a technical leader in the material testing industry.

1/

ACCREDITED
621-01 & 621-02

Accredited Nadcap Materials Testing Laboratory

April 19, 2005

CERTIFICATION

Section 1 of 1

WMT&R Report No. 5-25287
WMT&R Quote No. QN250563
Req No. 2767

MetalTek International
The Carondelet Division
8600 Commercial Blvd.
I-55 Industrial Park
Pevely, MO 63070-1528

Attention: Rick Suria

Subject: All processes, performed upon the material as received, were conducted at WMT&R, Inc. in accordance with the WMT&R Quality Assurance Manual, Rev. 9, dated 4/1/2000.
The following tests were performed on this order: TENSILE

TENSILE RESULTS: ASTM E21-03a
Requirements: UTS KSI (Min 95/Max ---) 0.2% YS KSI (Min 72/Max ---) 4D Elong. % (Min 32/Max ---) Modulus MSI (Min 21/Max ---)
SOAK TIME: 5 Minutes
SPEED OF TESTING: 0.0050 in./in./min., 0.0500 in./min./in.
MATERIAL: Metaltek CF8MNMnMOD CAST ON Bars from C-1 Coil CAR 4/14/05
DISPOSITION: Acceptable

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Sample	TestLog Number	Temp. °F	UTS KSI	0.2% YS KSI	Elong %	RA %	Modulus MSI	Ult. Load LBS	0.2% YLD. LBS	Orig. Dia. (in.)	Final Dia. (in.)	4D Orig GL (in.)	4D Final GL (in.)	Orig. Area (Sq. In.)	Machine Number	A/U/R
Tensile-2	B67872	-320	172.0	98.7	62	68	24.2	16590	9522	0.3504	0.1968	1.40	2.27	0.09643131	M9	A
Tensile-4E	B67873	-320	167.4	97.8	44	36	23.3	16120	9416	0.3502	0.2805	1.40	2.02	0.09632126	M9	A
Tensile-5A	B67874	-320	171.2	98.7	61	64	22.5	16450	9481	0.3498	0.2090	1.40	2.25	0.09610135	M9	A

A/U/R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

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Roy E. Starr/Matt Wojton
✓ Technical Services Manager/____ Tensile Supervisor

4-19-5
April 19, 2005

8

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METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

March 22, 2005
Lab No. 05P-0864
P.O. No. 12516
Page 1 of 2
(Corrected Report 6/15/05)

Attention: Chuck Ruud

REPORT OF MECHANICAL TESTS

SAMPLE ID: 3 EA., HT# 27728 Alloy CF8MNMNMOD +70°F

Sample ID	Original Area Sq. Inches	Reduced Area Sq. Inches	Reduction in Area %	Yield Strength PSI	Tensile Strength PSI	Modulus of Elasticity	Elongation (2.0" Gage Length) in.	%
27728-1	.1948	.0683	64.9	34,600	82,500	21.3	1.06	53.0
27728-2	.1886	.0697	63.0	34,800	85,100	20.5	1.03	51.5
27728-3	.1924	.0683	64.5	33,300	83,900	21.1	1.00	50.0

Round, reduced section tensiles

Yield taken at .2% offset

Tested in accordance with ASTM A 370-03a

Identification of tested specimens provided by the client.

Ken Schmitz, Director
Materials Testing

KS/tw

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Certificate No. 0397-01
Certificate No. 0397-02

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Pevely, MO 63070

March 22, 2005
Lab No. 05P-0864
P.O. No. 12516
Page 2 of 2
(Corrected Report 6/15/05)

Attention: **Chuck Ruud**

REPORT OF MECHANICAL TESTS

SAMPLE ID: HT# 28597 & HT# 28679

Sample ID	Original Area Sq. Inches	Reduced Area Sq. Inches	Reduction in Area %	Yield Strength PSI	Tensile Strength PSI	Elongation (2.0" Gage Length) in.	%
28597	.1886	.1140	39.5	54,600	84,100	0.48	24.0
28679	.1863	.1029	44.7	57,400	82,900	0.46	23.0

Round, reduced section tensiles

Yield taken at .2% offset

Tested in accordance with ASTM A 370-03a

Identification of tested specimens provided by the client.

Unrelated to project CHR 6/14/05

Karl Schmitz, Director
Materials Testing

KS/tw

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Certificate No. 0367-01
Certificate No. 0367-02

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METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

May 12, 2005
Lab No. 05P-1439
P.O. No.12516
Page 1 of 1

Attention: **Chuck Ruud**

REPORT OF MECHANICAL TESTS

SAMPLE ID: HT# 27728

Sample ID	Original Area Sq. Inches	Reduced Area Sq. Inches	Reduction in Area %	Yield Strength PSI	Modulus MSI	Tensile Strength PSI	Elongation (2.0" Gage Length) in.	Elongation (2.0" Gage Length) %
27728	.1948	.0651	66.6	37,300	28.1	83,100	1.1	55.0

Round, reduced section room temperature tensiles

Yield taken at .2% offset

Tested in accordance with ASTM A 370-03a

Identification of tested specimens provided by the client.

KS/tw

Karl Schmitz, Director
Materials Testing

ACCREDITED

Certificate No. 0397-01
Certificate No. 0397-02

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May 3

METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

June 1, 2005
Lab No. 05P-1658
P.O. No. 12516
Page 1 of 1

Attention: Chuck Ruud

REPORT OF MECHANICAL TESTS

SAMPLE ID: HT#'s 27728, 29511, 29497, 29563, 29560, 29553

Retest of material

Sample ID	Original Area Sq. Inches	Reduced Area Sq. Inches	Reduction in Area %	Yield Strength PSI	Tensile Strength PSI	Elongation (2.0" Gage Length) in.	Elongation (2.0" Gage Length) %	Modulus of Elastisity (MSI)
27728	.1886	.0830	56.0	36400	83100	1.05	52.5	24.4
27728b	.1886	.0908	51.9	34100	84300	1.00	50.0	23.4

Sample ID	Original Area Sq. Inches	Reduced Area Sq. Inches	Reduction in Area %	Yield Strength PSI	Tensile Strength PSI	Elongation (2.0" Gage Length) in.	Elongation (2.0" Gage Length) %
29511	.1995	.1878	05.9	40600	60400	0.12	06.0
29497	.1932	.1772	08.3	35700	62100	0.18	09.0
29563	.1847	.1840	00.4	37700	37900	0.04	02.0
29560	.1863	.1728	07.3	47500	69500	0.24	12.0
29553	.1886	.1765	06.4	50100	72700	0.16	08.0

NDS F
NDS F
F
OK
OK

Round, reduced section tensiles

Yield taken at .2% offset

Tested in accordance with ASTM A 370-03a

Identification of tested specimens provided by the client.

Unrelated to project
4/14/05

Karl Schmitz, Director
Materials Testing

KS/nmc

ACCREDITED

Certificate No. 0287.01
Certificate No. 0287.02

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METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

January 10, 2005
Lab No. 05P-0008
P.O. No. 12516
Page 3 of 3

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): HT# 27728, Alloy CF8 MnMN-MOD

SPECIFICATION: ASTM A 370-03a

SPECIMEN TYPE: "A" Vee Notch

SPECIMEN SIZE: 10 mm x 10 mm

TEMPERATURE OF TEST: -320°F

RESULTS:

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
27728-1	98	0.051	50
27728-2	91	0.060	50
27728-3	80	0.045	50
Average	90	0.052	50
BASE METAL	**FOOT LBS.**	**LATERAL EXPANSION**	**% SHEAR**
27728-4	77	0.038	40
27728-5	86	0.055	50
27728-6	61	0.032	40
Average	75	0.042	43
BASE METAL	**FOOT LBS.**	**LATERAL EXPANSION**	**% SHEAR**
27728-7	64	0.041	50
27728-8	67	0.043	50
27728-9	72	0.030	40
Average	68	0.038	47

Identification of tested specimens provided by client.

Karl Schmitz, Director
Materials Testing

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Certificate No. 0597-01
Certificate No. 0313-02

(10)

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Document # 10

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METALTEK INTERNATIONAL
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Pevely, MO 63070

January 10, 2005
Lab No. 05P-0008
P.O. No. 12516
Page 2 of 3

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): HT# 27728, Alloy CF8 MnMN-MOD

SPECIFICATION: ASTM A 370-03a

SPECIMEN TYPE: "A" Vee Notch

SPECIMEN SIZE: 10 mm x 10 mm

TEMPERATURE OF TEST: +70°F

RESULTS:

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
27728-1	139	0.097	100
27728-2	119	0.081	100
27728-3	167	0.091	100
Average	142	0.090	100
BASE METAL	**FOOT LBS.**	**LATERAL EXPANSION**	**% SHEAR**
27728-4	170	0.107	100
27728-5	124	0.071	100
27728-6	129	0.060	100
Average	141	0.079	100
BASE METAL	**FOOT LBS.**	**LATERAL EXPANSION**	**% SHEAR**
27728-7	141	0.103	100
27728-8	137	0.052	100
27728-9	150	0.114	100
Average	143	0.090	100

on chart

Identification of tested specimens provided by client.

Karl Schmitz, Director
Materials Testing

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Westmoreland Mechanical Testing & Research, Inc.
P.O. Box 388
Westmoreland Drive
Youngstown, Pa. 15696-0388 U.S.A.
Telephone: 724-537-3131 Fax: 724-537-3151
Website: www.wmtr.com
WMT&R is a technical leader in the material testing industry.

ACCREDITED
621-01 & 621-02

Accredited Nadcap Materials Testing Laboratory

April 28, 2005

CERTIFICATION

Section 1 of 1

MetalTek International
The Carondelet Division
8600 Commercial Blvd.
I-55 Industrial Park
Pevely, MO 63070-1528

WMT&R Report No. 5-26097
P.O. No. 19386R9
WMT&R Quote No. QN250563
Req. No. 4315

Attention: Rick Suria

Subject: All processes, performed upon the material as received, were conducted at WMT&R, Inc. in accordance with the WMT&R Quality Assurance Manual, Rev. 9, dated 4/1/2000.
The following tests were performed on this order: TENSILE

TENSILE RESULTS: ASTM E21-03a
Requirements: UTS ksi (Min 95\Max ---) 0.2% YS ksi (Min 72\Max ---) 4D Elong. % (Min 32\Max ---) Modulus Msi (Min 21\Max ---)
SOAK TIME: 5 Minutes
SPEED OF TESTING: 0.0050 in./in./min., 0.0500 in./min./in.
MATERIAL: 316 S/S

DISPOSITION: Acceptable

Sample	TestLog Number	Temp. °F	UTS ksi	0.2% YS ksi	Elong %	RA %	Modulus Msi	Ult. Load lbf	0.2% YLD. lbf	Orig. Dia. (in.)	Final Dia. (in.)	4D Orig GL (in.)	4D Final GL (in.)	Orig. Area (sq. in.)	Machine Number	A\U\R
Bar#1 (Lot#3012668/82743)	B75123	-320	187.7	126.3	33	22	27.1	37740	25394	0.5060	0.4471	2.00	2.65	0.20109020	M9	A
Bar#2 (Batch#W019711)	B75124	-320	166.9	109.5	34	27	26.4	33500	21990	0.5056	0.4315	2.00	2.67	0.20077240	M9	A

A\U\R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

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Roy E. Starr \ Matt Wolton
Technical Services Manager \ Tensile Supervisor

4-28-05
April 28, 2005

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Attention: Chuck Ruud

April 22, 2005
Lab No. 05P-1170
P.O. No. 12516
Page 1 of 1
(revised 6/15/05)

REPORT OF MECHANICAL TESTS

SAMPLE ID: 1 Ea., Sample Bar #1, Lot 3012668/82743
1 Ea., Sample Bar #2, Batch # WO19711

Sample ID	Original Area Sq. Inches	Reduced Area Sq. Inches	Reduction In Area %	Yield Strength PSI	Tensile Strength PSI	Elongation (2.0" Gage Length) in.	Elongation (2.0" Gage Length) %	Elastic Modulus
#1	.1901	.0855	55.0	56,500	85,000	0.80	55.0	25.5 MSI
#2	.1917	.0881	54.0	63,900	98,100	0.88	54.0	23.1 MSI

Round, reduced section all weld room temperature tensiles

Yield taken at .2% offset

Tested in accordance with ASTM A 370
Identification of tested specimens provided by the client

Karl Schmitz, Director
Materials Testing

KS/tw

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Attention: Chuck Ruud

April 6, 2005
Lab No. 05P-1007
P.O. No. 12516
Page 1 of 2

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): 1 Ea., Material (1) LNM4455, Lot # 3012668/82743

SPECIFICATION: ASTM A 370-03a

SPECIMEN TYPE: "A" Vee Notch

SPECIMEN SIZE: 10 mm x 10 mm

TEMPERATURE OF TEST: -320°F

ALL WELD METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
LNM4455-1	52	0.027	40
LNM4455-2	50	0.022	40
LNM4455-3	50	0.016	20
Average	51	0.022	33

Identification of tested specimen provided by client.

Ken Schmitz, Director
Materials Testing

KS/tw

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Certificate No. 0847.02

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February 28, 2005
Lab No. 05P-0554
P.O. No. 12516
Page 1 of 2
(Revised Report 3-2-05)

Attention: Rick Suria

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): Electrode LNM 4455 & B316NF — 301266827 43

SPECIFICATION: ASTM A 370-03a — L W01914 Cert 6/14/05

SPECIMEN TYPE: "A" Vee Notch, All Weld

SPECIMEN SIZE: 10 mm x 10 mm

TEMPERATURE OF TEST: +70°F

RESULTS:

ALL WELD	JOULES	FOOT LBS.	LATERAL EXPANSION	% SHEAR
LNM 4455-7	149	110	0.055	50
LNM 4455-8	130	96	0.050	50
LNM 4455-9	134	99	0.051	50
Average	**138**	102	0.052	50

ALL WELD	JOULES	FOOT LBS.	LATERAL EXPANSION	% SHEAR
B316NF-7	155	114	0.056	50
B316NF-8	151	111	0.053	50
B316NF-9	146	108	0.052	50
Average	**151**	111	0.054	50

Identification of tested specimen provided by client.

Karl Schmitz, Director
Materials Testing

KS/clm

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Certificate No. 0597-01
Certificate No. 0597-02

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February 28, 2005
Lab No. 05P-0554
P.O. No. 12516
Page 2 of 2
(Revised Report 3-2-05)

Attention: Rick Suria

PROCEDURE QUALIFICATION

WELDER: TERRY STANFIELD

MATERIAL: 1" CF8MnMn, Mod

SPECIFICATION: ASME IX

ELECTRODE: B316NF

PROCESS: SMAW

REDUCED SECTION TENSILE

SAMPLE ID	WIDTH INCHES	THICKNESS INCHES	AREA SQ. INCHES	ACTUAL LBS.	TENSILE STRENGTH PSI	FRACTURE
TS-2	.750	1.000	.7500	70,000	93,300	Weld Metal
TS-5	.750	1.010	.7575	71,000	93,700	Weld Metal

GUIDED BEND TEST

SAMPLE ID	BEND	RESULTS
TS-1	Side	Acceptable, No Discontinuities
TS-3	Side	Acceptable, No Discontinuities
TS-4	Side	Acceptable, No Discontinuities
TS-6	Side	Acceptable, No Discontinuities

KS/clm

Karl Schmitz, Director
Materials Testing
CWI No. 92120161

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Doc 16

Metaltek INTERNATIONAL

only welds 7 to 10 submitted 2/18/05 to EIO. CAR

C COIL RT1 WELD MAP

Checked 3/6/05 < 1.02

Defect Number	Photo Number	Length Inches	Width Inches	Depth Inches	Over 10% Wall Yes/No	Weld Permeability Result
1	1	3	1 1/2	3/16	NO	OK
2	1	5 1/2	2	1/4	NO	OK
3	1	9	4 1/2	1/4	NO	OK
4	1	12	4	1/4	NO	OK
5	1	2	1	1/4	NO	OK
6	1	2	1	1/4	NO	OK
7	1	3 7/8	3	3/16	NO	OK
8	1	1	1	1/4	NO	OK
9	1	3	2	1/4	NO	OK
10	1	2 3/4	1 3/4	1/4	NO	OK
11	1	1 3/4	1	1/4	NO	OK
12	1	2	1	1/4	NO	OK
13	2	4	3	1/4	NO	OK
14	2	3	1 1/2	1/4	NO	OK
15	2	2	1 1/2	1/4	NO	OK
16	2	2	1	1/4	NO	OK
17	2	1 3/4	1	1/4	NO	OK
18	2	2	1	1/4	NO	OK
19	2	2	1 1/4	1/4	NO	OK
20	2	2	1 1/2	1/4	NO	OK
21	2	1 1/2	1 1/2	1/4	NO	OK
22	58	2	1	1/4	NO	OK
23	3	2	2	1/2	NO	OK
24	3	2	1	3/16	NO	OK
25	3	4	3	3/4	~~NO~~ yes	OK
26	3	2	3 1/2	3/8	NO	OK
27	3	2	1	1/2	NO	OK
28	3	2 1/2	1 1/2	1/4	NO	OK
29	4	2 1/2	1 1/2	1/4	NO	OK
30	5	1 1/2	2	1/4	NO	OK
31	5	2 1/2	1 1/2	1/4	NO	OK
32	5	3 1/2	1 1/2	1/4	NO	OK
33	5	2	1 1/2	1/4	NO	OK
34	5	3	2	1/4	NO	OK
35	6	3	3/4	1/4	NO	OK

X

Scanned 5/9/Certs/E10.

C COIL RT1 WELD MAP

3/6/05
<1.02

Defect Number	Photo Number	Length Inches	Width Inches	Depth Inches	Over 10% Wall Yes/No	Weld Permeability Result
36	6	1 1/4	1	3/8	NO	OK
37	6	3 1/2	2 1/2	3/8	NO	OK
38	6	3	2 3/4	3/4	NO	OK
39	6	2	1 1/2	1/8	NO	OK
40	6	2	1 1/2	1/4	NO	OK
41	6	5	2	1	YES	OK
42	6	5 3/4	3	1 1/2	YES	OK
43	7	4 3/4	1 1/2	7/8	YES	OK
44	7	2 1/2	1 1/2	1/4	NO	OK
45	59	3 1/4	1 1/4	1/4	NO	OK
46	59	5 1/2	3 1/2	2	YES	OK
47	7	2	1 1/2	1/2	NO	OK
48	7	5	2 1/2	2	YES	OK
49	7	6	4	1 1/2	YES	OK
50	8	9	4	THRU	YES	OK
51	8	4	1/2	1/8	NO	OK
52	9	1	1/2	1/4	NO	OK
53	9	2 1/2	2	1/4	NO	OK
54	9	2	1	1/4	NO	OK
55	10	6 1/2	3 3/4	1/2	NO	OK
56	10	2 1/2	1 1/4	1/4	NO	OK
57	10	3 1/2	2 1/2	1/8	NO	OK
58	11	2	1 1/2	1/4	NO	OK
59	11	2	1 1/2	1/4	NO	OK
60	14	2 1/2	2	3/4	YES	OK
61	14	2	1 1/4	1/2	YES	OK
62	13	13	5 3/4	THRU	YES	OK
63	14	2 1/4	1 1/2	1/4	NO	OK
64	14	2 1/4	1 1/2	1/4	NO	OK
65	14	7 1/4	5 1/2	1 3/4	YES	OK
66	14	3	1	1/4	NO	OK
67	14	8 1/4	4	1 1/2	YES	OK
68	14	5 1/2	3	1	YES	OK
69	17	6	2	1 1/2	YES	OK
70	17	3	2 1/2	1 3/4	YES	OK
71	17	7 1/2	4 1/2	2 3/4	YES	OK
72	17	3	1	1/4	NO	OK

C COIL RT1 WELD MAP

3/6/05
1.02

Defect Number	Photo Number	Length Inches	Width Inches	Depth Inches	Over 10% Wall Yes/No	Weld Permeability Result
73	16	3	1	1/4	NO	OK
74	17	1	1/2	1/4	NO	OK
75	15	3	2 1/2	1/4	NO	OK
76	15	2	1 1/2	1/4	NO	OK
77	16	2	1 1/2	1/4	NO	OK
78	19	2 1/2	1 1/2	1/4	NO	OK
79	18	4 7/8	1 1/2	1/2	YES	OK
80	18	1 1/2	1	1/4	NO	OK
81	18	4	3 3/4	1 1/4	YES	OK
82	20	11 1/2	4 1/2	2	YES	OK
83	20	6	3	1	YES	OK
84	23	1 1/2	1	1/8	NO	OK
85	23	3	1 1/2	1/8	NO	OK
86	23	4	3 1/2	3/8	NO	OK
87	23	6	2	3/8	NO	OK
88	21	5	3 1/4	7/8	YES	OK
89	22	8 1/2	2 1/2	3/4	Yes	OK
90	22	3	1 1/2	3/8	Yes	OK
91	60	1	1	1/8	No	OK
92	60	1	1/2	1/8	No	OK
93	23	4	1 1/2	3/8	Yes	OK
94	23	3	2 1/2	3/8	Yes	OK
95	23	1 1/2	1	1/8	No	OK
96	23	1	1	1/8	No	OK
97	23	3	2	1/8	No	OK
98	61	4 1/2	1 1/2	1/4	Yes	OK
99	24	1 1/2	3/4	7/8	Yes	OK
100	24	9 3/4	4 1/4	2 1/8	Yes	OK
101	24	1 1/2	1	1/8	No	OK
102	24	6	2	1/2	Yes	OK
103	24	1	1	1/8	No	OK
104	24	1	1/2	1/2	No	OK
105	24	3 1/2	3	1 1/4	Yes	OK
106	26	6 7/8	2	1	Yes	OK
107	26	1 1/2	1 1/2	3/4	Yes	OK
108	26	7	5	1 1/2	Yes	OK
109	27	11 1/2	6 1/2	2 1/2	Yes	OK

C COIL RT1 WELD MAP

3/6/05
<1.02

Defect Number	Photo Number	Length Inches	Width Inches	Depth Inches	Over 10% Wall Yes/No	Weld Permeability Result
110	25	6 1/2	1	3/8	Yes	OK
111	25	1	1	3/8	Yes	OK
112	62	2	1	3/8	Yes	OK
113	62	1	1/2	3/8	Yes	OK
114	28	2	1	3/8	Yes	OK
115	28	3 3/4	1	3/8	Yes	OK
116	28	1	1	3/16	No	OK
117	29	1 1/2	1 1/2	3/16	No	OK
118	29	4	1 1/2	3/16	No	OK
119	28	2	1 1/2	3/8	Yes	OK
120	28	2	1 1/2	3/8	Yes	OK
121	28	1 1/2	1	3/8	No	OK
122	28	3 1/2	1 1/2	3/8	No	OK
123	28	1	1/2	1/8	No	OK
124	28	2	1	3/8	No	OK
125	28	17	2	3/8	No	OK
126	30	2	1 1/2	1/4	No	OK
127	30	3 1/2	1 3/4	3/4	Yes	OK
128	32	1 3/4	1	3/8	Yes	OK
129	32	2	1	1/8	No	OK
130	32	3	1 3/4	1/8	No	OK
131	32	1	1/2	1/8	No	OK
132	32	1/2	1/2	1/8	No	OK
133	32	2 3/4	1/2	3/8	Yes	OK
134	32	2 3/4	1 3/4	1/4	Yes	OK
135	31	5 1/2	3	1 1/2	Yes	OK
136	31	4	2	1 1/2	Yes	OK
137	31	3	2	3/4	Yes	OK
138	31	5 1/2	2	1	Yes	OK
139	31	3	3	1	Yes	OK
140	31	3 1/2	3	1	Yes	OK
141	31	5 3/4	1 1/2	1/4	No	OK
142	31	1 1/2	1	1/4	No	OK

1. Weld maps submitted to EIO/PPPL on _____ By: _____.
2. Weld maps approved by EIO/PPPL on _____ By: _____.

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C COIL RT1 WELD MAP

3/6/05
<1.02

Defect Number	Photo Number	Length Inches	Width Inches	Depth Inches	Over 10% Wall Yes/No	Weld Permeability Result
143	33	2	1	1/8	No	OK
144	33	2	1	1/2	No	OK
145	32	3	1/2	1/8	No	OK
146	32	2	1/2	1/8	No	OK
147	35	4	3	1/8	No	OK
148	35	3	1 1/2	1/8	No	OK
149	35	2 1/2	1 1/2	1/8	No	OK
150	35	3 1/2	2 1/2	1/8	No	OK
151	34	12 1/2	2 1/2	2	Yes	OK
152	34	3	1 1/2	3/4	Yes	OK
153	34	3	2 1/2	1	Yes	OK
154	34	3	1 3/4	7/8	Yes	OK
155	38	2	1	1/8	No	OK
156	38	5 1/2	1 1/2	1/2	Yes	OK
157	38	1 1/2	1	3/8	Yes	OK
158	36	2	1 1/2	3/8	Yes	OK
159	37	3 1/2	3	1	Yes	OK
160	37	1 1/2	1	1/2	Yes	OK
161	37	1	1	3/8	Yes	OK
162	39	7	1 1/2	3/8	Yes	OK
163	39	1 1/2	1 1/2	1/2	Yes	OK
164	39	1	1/2	1/8	No	OK
165	39	3 1/2	1	3/8	No	OK
166	39	1	1	1/8	No	OK
167	39	1 1/2	1	3/8	Yes	OK
168	40	4	2	3/8	No	OK
169	40	8	1 1/2	3/8	Yes	OK
170	40	1 1/2	1 1/2	1/8	No	OK
171	40	6 3/4	4	3/8	Yes	OK
172	63	5 1/2	1	1/2	Yes	OK
173	41	4	2 1/4	3/16	No	OK
174	41	4	1	3/8	Yes	OK
175	41	5	1	3/8	Yes	OK
176	42	1	1/2	1/2	No	OK
177	43	1	1	3/8	Yes	OK

15

C COIL RT1 WELD MAP

3/6/05
≤1.02

Defect Number	Photo Number	Length Inches	Width Inches	Depth Inches	Over 10% Wall Yes/No	Weld Permeability Result
178	43	1 1/2	1	3/8	No	OK
179	43	1 1/2	1	3/8	No	OK
180	44	1	1	1/2	No	OK
181	44	1	1	1/2	No	OK
182	44	2	2	1	Yes	OK
183	44	2 1/2	2	3/4	Yes	OK
184	45	1	1	1/2	No	OK
185	46	1	1/2	3/8	Yes	OK
186	46	1	1	1/8	No	OK
187	64	2	1 1/2	1/4	No	OK
188	47	2	1 1/2	1/4	No	OK
189	48	2	1 1/2	1/4	No	OK
190	48	3	2 1/4	1/4	No	OK
191	48	9 1/4	3	1 7/8	Yes	OK
192	49	1 1/4	1	3/8	No	OK
193	49	6 1/8	3 3/4	1 1/8	Yes	OK
194	49	1 3/4	1 1/4	3/8	No	OK
195	50	1 1/2	1	1/8	No	OK
196	65	1	1	3/8	No	OK
197	51	2	1 1/4	3/8	No	OK
198	51	6	5/4	1/2	No	OK
199	51	4	1 1/2	3/8	No	OK
200	55	2	1 1/2	1/8	No	OK
201	54	4	3 1/4	2 1/2	Yes	OK
202	52	5	2	1/2	No	OK
203	52	6 3/4	3	3/8	No	OK
204	52	5 1/2	3 1/2	3 1/4	Yes	OK
205	57	3 1/4	3	2 1/4	Yes	OK
206	56	7 1/2	3	2	Yes	OK
207	66	3	2 7/8	1/8	No	OK
208	66	1	1/2	1/8	No	OK
209	66	2 1/8	1 1/2	3/8	No	OK
210	66	2 1/2	1	3/8	No	OK
211	66	2	1 1/2	1 1/4	Yes	OK
212	68	7	3 1/4	1	Yes	OK
213	68	5 1/2	3 1/4	1 1/2	Yes	OK
214	68	5 1/2	4	3/16	No	OK

Ø 4

C COIL RT1 WELD MAP

3/6/05
Checked
1.02

Defect Number	Photo Number	Length Inches	Width Inches	Depth Inches	Over 10% Wall Yes/No	Weld Permeability Result
215	69	2 3/4	2	1 1/8	Yes	OK
216	69	1 1/2	1	1/8	No	OK
217	70	12	11	2	Yes	OK
218	70	1	1/2	3/16	No	OK
219	71	11 3/4	1/2	3/16	No	OK
220	72	2 3/8	1	3/8	No	OK
221	73	6	4 3/4	2	Yes	OK
222	74	1	1/2	1/8	No	OK
223	74	1	1/2	1/2	No	OK
224	74	3	1/2	1/8	No	OK
225	75	9 1/2	2 1/2	2 1/2	Yes	OK
226	76	12 1/2	1/2	1/8	No	OK
227	76	1	1/2	1/2	No	OK
228	77	1	1	3/4	Yes	OK
229	77	4	1/2	1/8	No	OK
230	78	2	1	1/2	No	OK
231	78	9	5	3 1/2	Yes	OK
232	79	1	1/2	1/8	No	OK
233	79	4 1/2	1/2	1/2	No	OK
234	79	1 3/4	1 1/2	3/8	Yes	OK
235	79	3	2	1	Yes	OK
236	79	2	1 1/2	1	Yes	OK
237	80	2	1	3/8	No	OK
238	81	2	1	3/8	No	OK
239	82	3	1 1/2	1 1/2	Yes	OK
240	82	5 1/2	1 3/4	1/8	No	OK
241	83	2 1/2	1 1/2	3/8	No	OK
242	85	1	1	1/8	No	OK
243	84	2	1 3/4	3/8	Yes	OK
244	84	1	1	1/8	No	OK
245	86	1	1/2	1/8	No	OK
246	86	1	1	3/8	No	OK
247	87	1 3/4	1	3/8	No	OK
248	87	2 3/4	1 1/2	1	Yes	OK
249	87	1 1/2	1	3/8	Yes	OK
250	88	1 1/2	1	3/8	No	OK
251	88	1 1/2	1	3/8	No	OK

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Document #16

C COIL RT1 WELD MAP

Defect Number	Photo Number	Length Inches	Width Inches	Depth Inches	Over 10% Wall Yes/No	Weld Permeability Result
252	89	3 3/4	2	1	Yes	OK

5/6/05
1.02

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Document #16

C COIL RT1 WELD MAP

Defect Number	Photo Number	Length Inches	Width Inches	Depth Inches	Over 10% Wall Yes/No	Weld Permeability Result
253	1	1	1	1/8	NO	OK
254	1	1	1	1/8	NO	OK
255	1	2	1 5/8	1/8	NO	OK
256	1	1 1/2	1	3/8	NO	OK
257	2	2 1/2	1 1/2	3/4	NO	OK
258	2	1	1	1/8	NO	OK
259	2	4	1	3/8	NO	OK
260	3	2	1 1/2	1/2	YES	OK
261	3	4	2	3/4	YES	OK
262	4	1	1/2	3/8	NO	OK
263	5	1	1	3/8	NO	OK
264	5	1 1/2	1 1/2	1/2	YES	OK
265	6	1	1	5/8	NO	OK
266	6	9 1/4	2	3/8	NO	OK
267	7	1 1/2	1/2	1/4	NO	OK
268	7	2	1 1/2	1/4	NO	OK
269	7	3	2	1/4	NO	OK
270	7	5	2	1/8	NO	OK
271	7	4	2	1/8	NO	OK
272	7	1 1/2	1 1/2	1/4	NO	OK
273	7	1 1/2	1	1/4	NO	OK
274	7	1	1	3/8	NO	OK
275	8	2	1	1	YES	OK
276	8	1	1	3/8	NO	OK
277	8	1 1/2	1	1/2	NO	OK
278	8	1	1	1/2	NO	OK
279	8	2 1/2	2	5/8	NO	OK
280	9	2 1/2	2	5/8	NO	OK
281	9	2	2	1/2	YES	OK
282	10	1	1	1/8	NO	OK
283	11	4	1 1/2	1/2	YES	OK
284	11	3	1	1/2	YES	OK
285	12	2	1/2	1/4	NO	OK

1. Weld maps submitted to EIO/PPPL on 3/23/05 By: RS.
2. Weld maps approved by EIO/PPPL on N/A By: _____.

#9

C COIL RT1 WELD MAP

Defect Number	Photo Number	Length Inches	Width Inches	Depth Inches	Over 10% Wall Yes/No	Weld Permeability Result
286	12	2	2	1	YES	OK
287	12	2	2	1/2	YES	OK
288	12	1	1	1/4	NO	OK
289	12	2 1/2	2	3/8	NO	OK
290	12	4	2	1/4	NO	OK
291	12	1 1/2	1	3/8	NO	OK
292	12	1 1/2	1	1/8	NO	OK
293	12	2	1	3/8	NO	OK
294	12	3	1	5/8	NO	OK
295	12	2	1	3/8	NO	OK
296	13	1	1	1/4	NO	OK
297	13	2	1	1/4	NO	OK
298	13	1	1	1/8	NO	OK
299	13	1 1/2	1 1/2	1/2	NO	OK
300	13	2	1	3/8	NO	OK
301	13	3	2 1/2	1 1/4	YES	OK
302	13	6 1/2	3 1/2	1 1/2	YES	OK
303	13	3 1/2	3 1/2	1	YES	OK
304	14	2 1/2	2 1/2	1	YES	OK
305	14	4	3	1	YES	OK
306	14	1 1/2	1 1/2	3/8	NO	OK
307	15	4	2	3/8	NO	OK
308	15	4	2	3/8	NO	OK
309	15	2 1/2	2 1/2	5/8	NO	OK
310	16	2 1/2	2 1/8	1/2	YES	OK
311	17	3 1/2	3	3/8	NO	OK
312	17	1	1	1/8	NO	OK
313	17	3	1 1/2	1/8	NO	OK
314	17	3	1 1/2	1/8	NO	OK
315	17	2 1/2	2 1/2	3/8	NO	OK
316	17	2 1/2	2	3/8	NO	OK
317	17	1 1/2	1	1/8	NO	OK
318	18	1	1	1/8	NO	OK

1. Weld maps submitted to EIO/PPPL on 3/23 By: RS
2. Weld maps approved by EIO/PPPL on NA By: _____

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Document #16

C COIL RT1 WELD MAP

Defect Number	Photo Number	Length Inches	Width Inches	Depth Inches	Over 10% Wall Yes/No	Weld Permeability Result
319	18	3	2	5/8	NO	OK
320	19	5	2 1/2	5/8	NO	OK
321	20	3 1/2	2 1/2	3/8	NO	OK
322	1	1 1/2	1 1/2	1/4	NO	OK
323	2	2	2	3/8	NO	OK
324	2	2 1/2	2	3/8	NO	OK
325	3	1 1/2	1	3/8	NO	OK
326	4	4	1	1/4	NO	OK
327	5	1 1/2	1 1/2	1/4	NO	OK
328	6	3	2 1/2	1/4	NO	OK
329	7	2 1/2	2	3/8	NO	OK

1. Weld maps submitted to EIO/PPPL on 3/23/05 By: RS
2. Weld maps approved by EIO/PPPL on NA By: /

#1

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Document # 17

Carondelet Division

8600 Commericial Blvd. - Pevely, MO 63070 USA
Phone: 636-479-4499 - Fax: 636-479-3399

Final Inspection Report

Customer Name: ENERGY INDUSTRIES OF OHIO

Pattern: MCWF-C1

Order Number: PPPL-FP-LTS-2

Revised 7/26/05

ASTM Metal CF8MNMN MOD

Date 7/26/2005

Type Description	Cert Number	Procedure	Acceptance Criteria	Actual
Radiographic	S73140-1	Technique # 12726	MSS SP 54	Acceptable
Liquid Penetrant	S73140-1	CQP - 300 Rev 9	SEE NOTE	Acceptable
Notes Acceptance per ASTM A903. Acceptance criteria - level 1 for high stressed areas, level 2 for all other areas.				
Mag Perm	S73140-1	SOP Mag Perm 100 Rev 1	<1.02	Acceptable
Visual	S73140-1	CQP - 500 REV 4	ASTM A802 LEVEL 2	Acceptable

Liquid Penetrant
Technician: Kevin Anderson
ASNT Level II

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

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Document #18

MetalTek INTERNATIONAL

RADIOGRAPHIC INTERPRETATION REPORT

CUSTOMER	PURCHASE ORDER NUMBER	DATE	CONTROL NO.	PAGE
Energy Industries of Ohio	28030003	1-19-05	40851	1 of 6

PART NO.	SPECIFICATION	CLASS	TOTAL PIECES	PIECES ACCEPTED
MCWF-C1	MSS-SP-54	See Spec	1	1

RADIOGRAPHED BY:	INTERPRETED BY:	ASNT LEVEL
Cooperheat/MQS	Kelley/Suria	II

FILM TYPE	MATERIAL	ISOTOPE	CODE
Kodak	CF8M NMWMat	IRIDIUM 192 COBALT 60 Varian model 42000	ASTM E94 ✓ ASME MIL-STD-453

VIEW	PENE	ACCEPT	REJECT	SHRINK	INCLUSION	POROSITY	LINEAR	SURFACE	LOF/LOP	COMMENTS
CRT.1										
Inside Rail	1-2	60 120	✓						✓		excavation
	2-3	60 120 MA	✓						✓		excavation
	3-4	60 120 140	✓		3				✓		excavations Light Leak
	4-5	↓	✓		3				✓		excavations
	5-6	↓	✓						✓		excavation
	6-7	60 120	✓						✓		excavation
	7-8	60 80 120	✓								
	8-9	60 120	✓						✓		excavation Film Scratches
	9-10	↓	✓						✓		excavation
	10-11	↓	✓						✓		excavations
	11-12	↓	✓						✓		excavations
	12-13	↓	✓		2				✓		excavations
	13-14	↓		X			X				>2 III
	14-15	↓	✓				2		✓		Film crimp-excavations
	15-16	↓	✓						✓		Light Leak-excavations
	16-17	↓	✓						✓		excavations
	17-18	↓	✓						✓		excavations
	18-19	↓	✓						✓		excavations
	19-20	↓	✓						✓		excavations
↓	20-21	↓	✓								

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Energy Industries of OHIO	28030003	1-19-05	40851	2 of 6

PART NO.	SPECIFICATION	CLASS	TOTAL PIECES	PIECES ACCEPTED
MCWF-C1	MSS-SP-54	See Spec	1	1

RADIOGRAPHED BY:	INTERPRETED BY:	ASNT LEVEL
Cooperheat/MQS	Kelley/Suria	II

FILM TYPE	MATERIAL	ISOTOPE	CODE
Kodak	CF8M NMV Mod	Varian model 62000 IRIDIUM 192 COBALT 60	ASTM E94 ✓ ASME MIL-STD-453

CRT.1

	VIEW	PENE	ACCEPT	REJECT	SHRINK	INCLUSION	POROSITY	LINEAR	SURFACE	LOF/LOP	COMMENTS
Inside Rail	21-22	60 120		X	X						1
	22-23		/						/		excavations Processer Marks
	23-24		/						/		excavations
	24-25		/						/		excavation Processer Marks
	25-26		/								11
	26-27		/				2				Processer Marks
	V28		/				2		/		excavation
	29-30		/				2		/		excavations
	30-1		/				2		/		excavations Processer Marks
Body	1-2	50	/			2			/		Excavations
	2-3		/						/		Excavations
	3-4		/						/		Excavations, Processe Mark
	4-5		/						/		Excavations
	5-6		/						/		Excavations
	7-8		/			2			/		Excavation
	8-9		/	X				X	/		Excavation
	9-10		/				2		/		Excavations
	11-12		/						/		Excavation
	12-13		/								

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MetalTek INTERNATIONAL

RADIOGRAPHIC INTERPRETATION REPORT

CUSTOMER	PURCHASE ORDER NUMBER	DATE	CONTROL NO.	PAGE
Energy Industries of OHIO	28030003	1-19-05	40851	3 of 6

PART NO.	SPECIFICATION	CLASS	TOTAL PIECES	PIECES ACCEPTED
ACWF-C1	MSS-SP-54	SeeSpec	1	1

RADIOGRAPHED BY:	INTERPRETED BY:	ASNT LEVEL
Copperweat/MQS	Kelley/Suria	II

FILM TYPE	MATERIAL	ISOTOPE	CODE
Kodak	CF8MW/MW Mod	Varian model 62000 IRIDIUM 192 COBALT 60	ASTM E94 ✓ ASME MIL-STD-453

CRT.1

	VIEW	PENE	ACCEPT	REJECT	SHRINK	INCLUSION	POROSITY	LINEAR	SURFACE	LOF/LOP	COMMENTS
Body	13-14	50	/								
	15-16		/						/		Excavations Processor Marks
	16-17		/								
	18-19		/						/		Excavations
	19-20		/						/		Excavations
	20-21		/						/		Excavations
	21-22		/						/		Excavations
	23-24			X	X				/		Excavations
	24-25		/						/		Excavations
	26-27		/						/		Excavations
	27-28	↓	end weld	X	X						
	29-30	30		X	X						
	30-31		/						/		excavation- Processer Marks
	32-33		/								
	33-34		/						/		Processing Marks
	35-36		/						/		excavations, Film Scratch
	36-37			X	X						
	38-39		/						/		excavations
	39-40	↓		X	X						
↓	41-42	30 40		X	X						

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MetalTek INTERNATIONAL

RADIOGRAPHIC INTERPRETATION REPORT

CUSTOMER	PURCHASE ORDER NUMBER	DATE	CONTROL NO.	PAGE
Energy Industries of Ohio	28030003	1-19-05	40851	4of6

PART NO.	SPECIFICATION	CLASS	TOTAL PIECES	PIECES ACCEPTED
MCWF-C1	MSS-SP-54	SeeSpec	1	1

RADIOGRAPHED BY:	INTERPRETED BY:	ASNT LEVEL
Cooperheat/MQS	Kelley/Suria	II

FILM TYPE	MATERIAL	ISOTOPE	CODE
Kodak	CF8MNMN Mod	varian model 620DC IRIDIUM 192 COBALT 60	ASTM E94 / ASME MIL-STD-453

CRT.1

VIEW	PENE	ACCEPT	REJECT	SHRINK	INCLUSION	POROSITY	LINEAR	SURFACE	LOF/LOP	COMMENTS
Body 42-43	30 40	/						/		excavation-Processer Mark
44-45		/								Processer Marks
45-46		/			1			/		excavation--Prosser Mark
47-48		/			2			/		excavation-Processer Mark
48-49	↓		X	X						
50-51	↓	/						/		excavation-Processer Mark
52-53	30 100 40 140		X	X						
53-54	↓	/						/		excavation-Film Scratch
54-55	30 40 100	/						/		excavation-Film scratches
55-56		/								
56-57	↓	/						/		excavation-Processer Marks
57-58	60 140		X	X						
58-59	30 40	/		1	1			/		excavation-Light Leak
59-60		/						/		excavations
60-61		/								
62-63	↓	/			1	1		/		excavations.
63-64	30	/			1			/		excavations
65-66	60 180 140 200	/						/		excavations
67-68	30 40 60		X	X						
68-69	40 30	/		1				/		excavations

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MetalTek INTERNATIONAL

RADIOGRAPHIC INTERPRETATION REPORT

CUSTOMER	PURCHASE ORDER NUMBER	DATE	CONTROL NO.	PAGE
Energy Industries of OHIO	28030003	1-19-05	40851	5 of 6

PART NO.	SPECIFICATION	CLASS	TOTAL PIECES	PIECES ACCEPTED
MCWF-C1	MSS-SP-54	See Spec	1	1

RADIOGRAPHED BY:	INTERPRETED BY:	ASNT LEVEL
Cooperheat/MQS	Kelley/Suria	II

FILM TYPE	MATERIAL	ISOTOPE	CODE
Kodak	CF8M w/M.Mod	varian model 62000 IRIDIUM 192 COBALT 60	ASTM E94 / ASME MIL-STD-453

	VIEW	PENE	ACCEPT	REJECT	SHRINK	INCLUSION	POROSITY	LINEAR	SURFACE	LOF/LOP	COMMENTS
CAT. 1											
Body	69-70	30 100 40 120		X	X						
	71-72	30 50 60 80 100	/								Processer Marks
	72-73	↓	/						/		excavation - Film scratch
	73-74	30 40 80	/			1			/		excavation Film scratch
	74-75	↓	/						/		Excavations, crimp
	75-76	30 40	/						/		
	76-77	↓	/						/		Excavations
	78-79	30 40 60	/						/		Processer marks
	79-80	30 40	/						/		
	80-81	|	/						/		
	81-82	↓	/		1						
	83-84	30 40 60	/						/		
	85-86	30 40	/						/		
	86-87	30 40 120	/								
	87-88	30 40	/						/		
	88-89	30 40 60	/	X	X				/		
	90-91	30 40	/								
	92-93	↓	/						/		Excavation
	V94	50		X	X						
	V95	↓	/								Processer Mark

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MetalTek INTERNATIONAL

RADIOGRAPHIC INTERPRETATION REPORT

CUSTOMER	PURCHASE ORDER NUMBER	DATE	CONTROL NO.	PAGE
Energy Industries of OHIO	28030003	1-19-05	40851	6 of 6

PART NO.	SPECIFICATION	CLASS	TOTAL PIECES	PIECES ACCEPTED
MCWF-C1	MSS-SP-54	See Spec	1	1

RADIOGRAPHED BY:	INTERPRETED BY:	ASNT LEVEL
Cooperheat/MQS	Kelly/Suria	II

FILM TYPE	MATERIAL	ISOTOPE	CODE
Kodak	CF8MN	varian model 42000 IRIDIUM 192 COBALT 60	ASTM E94 / ASME MIL-STD-453

CRT

VIEW	PENE	ACCEPT	REJECT	SHRINK	INCLUSION	POROSITY	LINEAR	SURFACE	LOF/LOP	COMMENTS
Body 96-97	50	/						/		Excavations
97-98		/						/		Excavation
98-99		/						/		
100-101			X	X						
101-102			X	X				/		Excavation
102-103		/						/		Excavations
103-104			X	X				/		Excavation
104-105			X	X				✓		excavations
106-107			X				X	/		excavations
107-108		/			1			/		
108-109		/						✓		excavations
109-110			X	X				/		excavations
111-112		/						/		excavations - Processer marks
112-113		/			1			/		Filmscratch excavations
114-115			X				X			
115-116		/						/		excavations-ProcesserMarks
116-117	↓		X				X			
V64	20 30		X	X						

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RADIOGRAPHIC INTERPRETATION REPORT

CUSTOMER	PURCHASE ORDER NUMBER	DATE	CONTROL NO.	PAGE
Energy Industries of OHIO	2803 0003	3-19-05	40851	1 of 2

PART NO.	SPECIFICATION	CLASS	TOTAL PIECES	PIECES ACCEPTED
MCWF-C1	MSS-SP-54	See Spec	1	1

RADIOGRAPHED BY:	INTERPRETED BY:	ASNT LEVEL
Coopercheat/MQS	Coopercheat/MQS/Midget	II

FILM TYPE	MATERIAL	ISOTOPE	CODE
Kodak	CF8M/CW Mod	varian model 2000 IRIDIUM 192 COBALT 60	ASTM E94 ✓ ASME MIL-STD-453

Repair Views

CRT-1

VIEW	PENE	ACCEPT	REJECT	SHRINK	INCLUSION	POROSITY	LINEAR	SURFACE	LOF/LOP	COMMENTS
Body 8-9	50	✓						✓		Film Mark
23-24	↓	✓								
27-28	↓	✓						✓		
29-30	30		X				FBK		X	
36-37	↓	✓		1		1				
39-40	↓	✓						✓		
41-42	30/40	✓		1						
48-49	↓	✓			1	1		✓		
52-53	30/40/100/140	✓			2	1		✓		
57-58	60/140	✓						✓		
67-68	30/60/40	✓						✓		
69-70	30/40/100/120	✓		1						
88-89	30/60/40	✓	FBK	2						BK R,S
V94	50	✓						✓		
100-101	↓	✓		3						
101-102		✓		3						
103-104		✓		3						
104-105		✓		1						
106-107		✓	FBK	2			FBK	✓		
109-110	↓	✓		2						

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MetalTek INTERNATIONAL

RADIOGRAPHIC INTERPRETATION REPORT

CUSTOMER	PURCHASE ORDER NUMBER	DATE	CONTROL NO.	PAGE
Energy Industries of OHIO	28030003	3-19-05	40851	2 of 2

PART NO.	SPECIFICATION	CLASS	TOTAL PIECES	PIECES ACCEPTED
MCWF-C1	MSS-SP-54	sec spec	1	1

RADIOGRAPHED BY:	INTERPRETED BY:	ASNT LEVEL
Cooper Heat/MQS	Midgett	~~II~~

FILM TYPE	MATERIAL	ISOTOPE	CODE
Kodak	CF8MN MN mod	Varian Model 3000 IRIDIUM 192 / COBALT 60	ASTM E94 7 ASME MIL-STD-453

	VIEW	PENE	ACCEPT	REJECT	SHRINK	INCLUSION	POROSITY	LINEAR	SURFACE	LOF/LOP	COMMENTS
Repair Views CRT-1											
Body	114-115	50	/			1	1		/		
↓	116-117	↓	/		2						Processing Mark
↓	V64	~~20~~/30	/			1	1				
Inside Rail	13-14	60/120	/								
↓	21-22	↓	/		2						
Body	29-30	30	/		1	1	1		-		

S:DRIVE/MANUAL FORMS/RADIOGRAPHY
RIR-01 REV. 0 6/9/03

FORM CC034

C-1 Doc Package
Document 18a

TEAM COOPERHEAT-MQS, INC.

RADIOGRAPHIC TECHNIQUE SHEET

FORM 20.3-61 Rev. 4

5512 W. State St-Milwaukee, WI 53208 (414) 771-3060 Fax (414)771-9481 (800) 818-6403 www.cooperheat-mqs.com

CUSTOMER RSS NO.: _____ SHEET: _____ REV: _____ MQS TECH. NO.: 12970 REV.1*
MQS RSS NO.: _____

CUSTOMER METALTEK INTERNATIONAL DATE: 8-3-2005
PART NO. MCWF-C12103989 DESCRIPTION C COIL CASTING MATERIAL CF8MNM
TOTAL NUMBER OF VIEWS 121 NUMBER X-RAY VIEWS 121 NUMBER GAMMA RAY VIEWS 0
MACH(s) MAKE(s) VARIAN MODEL(s) L2000 S/N(s) 20 MAX KV(s) 7500
SOURCE(s) N/A
PROCEDURE SPECIFICATION MSS-SP-54 ACCEPTANCE CRITERIA MSS-SP-54
MQS PROCEDURE NO. 20.H.010 REV. 0 PENETRAMETER SPEC. ASTM E142-86
PROCESSING: AUTOMATIC X PROCESSOR B2000 MANUAL ___ TEMPERATURE 27.2°
TECHNICIAN J.P., S.S. NDT LEVEL II APPROVED BY Chris Rudd NDT LEVEL III

VIEW IDENTIFICATION		*	VIEWS 1-2	THROUGH	116-117	BODY	
SOURCE/X-RAY MACH USED		VARIAN	VIEWS A-B	THROUGH	DD-A	RAIL	
CURIES OR KV		7500			REV.1 :	CHANGED RAIL	VIEWS TO
MA OR PULSES		N/A				LETTERS	RATHER THAN
SOURCE TO FILM DISTANCE		*				NUMBERS.	
EXPOSURE TIME OR RADS		*					
MATERIAL THICKNESS		I					
MATERIAL GROUP		I					
PENETRAMETRER SIZE/(AMT)	GP. I	*		SEE ATTACHED	INFORMATION		
SHIM BLOCK SIZE	GP.	N/A					
FILM SIZE		*					
FILM TYPE/BRAND		*					
PB SCREEN, FRONT		.010					
PB SCREEN, BACK		.010					
SENSITIVITY		2-2T					
FILTER TYPE/LOCATION		N/A					
MASKING TYPE/LOCATION		N/A					
ANGLE		*					
NO. OF FILMS IN CASSETTE		*					
VIEWING: SING./DOUB./BOTH		S-B					
FOCAL SPOT SIZE		2 MM					
SKETCH AND/OR REMARKS		SEE ATTACHED					
GEOMETRIC UNSHARPNESS							

C-1 Doc Package
Document 18a

CUSTOMER Metaltek **RSS #** 12970 Rev.1 **PART NO.** MCWF-C1

VIEW	SFD	EXP. TIME	FILM TYPE	FILM SIZE	THK. RANGE	IQI
1-2	65"	25 KR	T	14 X 17	2-3/4"	50(2)
2-3	65"	25 KR	T	14 X 17	2-3/4"	50(2)
3-4	65"	25 KR	T	14 X 17	2-3/4"	50(2)
4-5	65"	25 KR	T	14 X 17	2-3/4"	50(2)
5-6	65"	25 KR	T	14 X 17	2-3/4"	50(2)
7-8	65"	25 KR	T	14 X 17	2-3/4"	50(2)
8-9	65"	25 KR	T	14 X 17	2-3/4"	50(2)
9-10	65"	25 KR	T	14 X 17	2-3/4"	50(2)
11-12	65"	25 KR	T	14 X 17	2-3/4"	50(2)
12-13	65"	25 KR	T	14 X 17	2-3/4"	50(2)
13-14	65"	25 KR	T	14 X 17	2-3/4"	50(2)
15-16	65"	25 KR	T	14 X 17	2-3/4"	50(2)
16-17	65"	25 KR	T	14 X 17	2-3/4"	50(2)
18-19	65"	25 KR	T	14 X 17	2-3/4"	50(2)
19-20	65"	25 KR	T	14 X 17	2-3/4"	50(2)
20-21	65"	25 KR	T	14 X 17	2-3/4"	50(2)
21-22	65"	25 KR	T	14 X 17	2-3/4"	50(2)
23-24	65"	25 KR	T	7 x 17	2-3/4"	50(2)
24-25	65"	25 KR	T	7 x 17	2-3/4"	50(2)
26-27	65"	25 KR	T	7 x 17	2-3/4"	50(2)
27-28	65"	25 KR	T	7 x 17	2-3/4"	50(2)
29-30	70"	25 KR	M125	14 x 17	1-1/2"	30(2)
30-31	70"	25 KR	M125	11 x 17	1-1/2"	30(2)
32-33	70"	25 KR	M125	14 x 17	1-1/2"	30(2)
33-34	70"	25 KR	M125	14 x 17	1-1/2"	30(2)
35-36	70"	25 KR	M125	11 x 14	1-1/2"	30(2)
36-37	70"	25 KR	M125	14 x 17	1-1/2"	30(2)
38-39	70"	25 KR	M125	14 x 17	1-1/2"	30(2)
39-40	70"	25 KR	M125	14 x 17	1-1/2"	30(2)
41-42	85"	35 KR	T/M125	14 X 17	1-1/2" – 2"	30, 40
42-43	85"	35 KR	T/M125	14 X 17	1-1/2" – 2"	30, 40
44-45	85"	35 KR	T/M125	14 X 17	1-1/2" – 2"	30, 40
45-46	85"	35 KR	T/M125	14 X 17	1-1/2" – 2"	30, 40
47-48	85"	35 KR	T/M125	14 X 17	1-1/2" – 2"	30, 40
48-49	85"	35 KR	T/M125	14 X 17	1-1/2" – 2"	30, 40
49-50-51	85"	35 KR	T/M125	14 X 17	1-1/2" – 2"	30, 40
52-53	90"	40 KR	D8/T/AA/Dumb	14 x 17	1-1/2" – 7"	30,40,100,140
53-54	90"	40 KR	D8/T/AA/Dumb	14 x 17	1-1/2" – 7"	30,40,100,140
54-55	90"	40 KR	D8/T/AA/Dumb	14 x 17	1-1/2" – 5"	30,40,100

C-1 Doc Package
Document 18a

CUSTOMER Metaltek **RSS #** 12970 Rev.1 **PART NO.** MCWF-C1

VIEW	SFD	EXP. TIME	FILM TYPE	FILM SIZE	THK. RANGE	IQI
55-56	90"	40 KR	D8/T/AA/Dumb	14 x 17	1-1/2" – 5"	30,40,100
56-57	90"	40 KR	D8/T/AA/Dumb	14 x 17	1-1/2" – 5"	30,40,100
57-58	93"	65 KR	D8/AA/T/D8	14 x 17	3" – 7"	60,140
58-59	90"	40 KR	T/M125	14 x 17	1-1/2" – 2"	30,40
59-60	90"	40 KR	T/M125	14 x 17	1-1/2" – 2"	30,40
60-61	90"	40 KR	T/M125	14 x 17	1-1/2" – 2"	30,40
62-63	90"	40 KR	T/M125	14 x 17	1-1/2" – 2"	30,40
63-64	90"	35 KR	T/M125	14 x 17	1-1/2"	30(2)
65-66	90"	150 KR	D8/AA/T/D8	14 x 17	3" – 10"	60,140,180,200
67-68	90"	40 KR	T/M125	14 x 17	1-1/2" – 3"	30,40,60
68-69	90"	40 KR	T/M125	14 x 17	1-1/2" – 2"	30,40
69-70	90"	55 KR	D8/M125/AA	14 x 17	1-1/2" – 6"	30,40,100,120
V64	90"	40 KR	M125/M100	11 X 14	1" – 1-1/2"	20,30
71-72	80"	50 KR	AA/M125/T	14 x 17	1-1/2" – 5"	30,50,60,80,100
72-73	80"	90 KR	AA/M125/M100/T	14 x 17	1-1/2" – 5"	30,50,60,80,100
73-74	80"	35 KR	T/M125	14 x 17	1-1/2" – 4"	30,40,80
74-75	80"	35 KR	T/M125	14 x 17	1-1/2" – 4"	30,40,80
75-76	80"	30 KR	T/M125	14 x 17	1-1/2" – 2"	30,40
76-77	80"	30 KR	T/M125	11 x 14	1-1/2" – 2"	30,40
78-79	80"	35 KR	T/M125	14 x 17	1-1/2" – 3"	30,40,60
79-80	80"	35 KR	T/M125	14 x 17	1-1/2" – 2"	30,40
80-81	80"	30 KR	T/M125	14 x 17	1-1/2" – 2"	30,40
81-82	80"	30 KR	T/M125	7 x 17	1-1/2" – 2"	30,40
83-84	80"	35 KR	T/M125	14 x 17	1-1/2" – 3"	30,40,60
85-86	80"	30 KR	T/M125	14 x 17	1-1/2" – 2"	30,40
86-87	80"	60 KR	D8/M125/T	14 x 17	1-1/2" – 6"	30,40,120(2)
87-88	80"	30 KR	T/M125	14 x 17	1-1/2" – 2"	30,40
88-89	80"	40 KR	AA/M125/T	14 x 17	1-1/2" – 3"	30,40,60
90-91	80"	30 KR	T/M125	14 x 17	1-1/2" – 2"	30,40
92-93	80"	30 KR	T/M125	14 x 17	1-1/2" – 2"	30,40
V94	72"	25 KR	T	14 x 17	2-3/4"	50
V95	72"	25 KR	T	8 x 10	2-3/4"	50
96-97	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)
97-98	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)
98-99	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)
100-101	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)
101-102	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)
102-103	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)
103-104	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)
104-105	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)
106-107	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)

C-1 Doc Package
Document 18a

CUSTOMER Metaltek **RSS #** 12970 Rev.1 **PART NO.** MCWF-C1

VIEW	SFD	EXP. TIME	FILM TYPE	FILM SIZE	THK. RANGE	IQI
107-108	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)
108-109	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)
109-110	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)
111-112	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)
112-113	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)
114-115	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)
115-116	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)
116-117	65"	25 KR	T/T	14 x 17	2-3/4"	50(2)

C-1 Doc Package
Document 18a

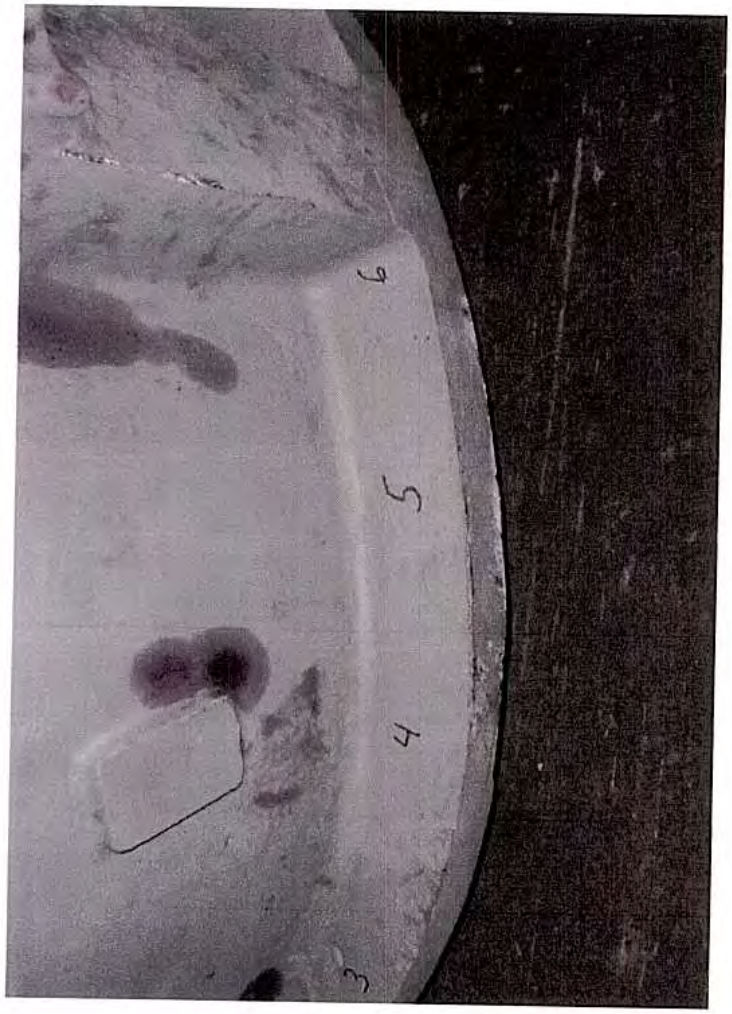
RAIL VIEWS

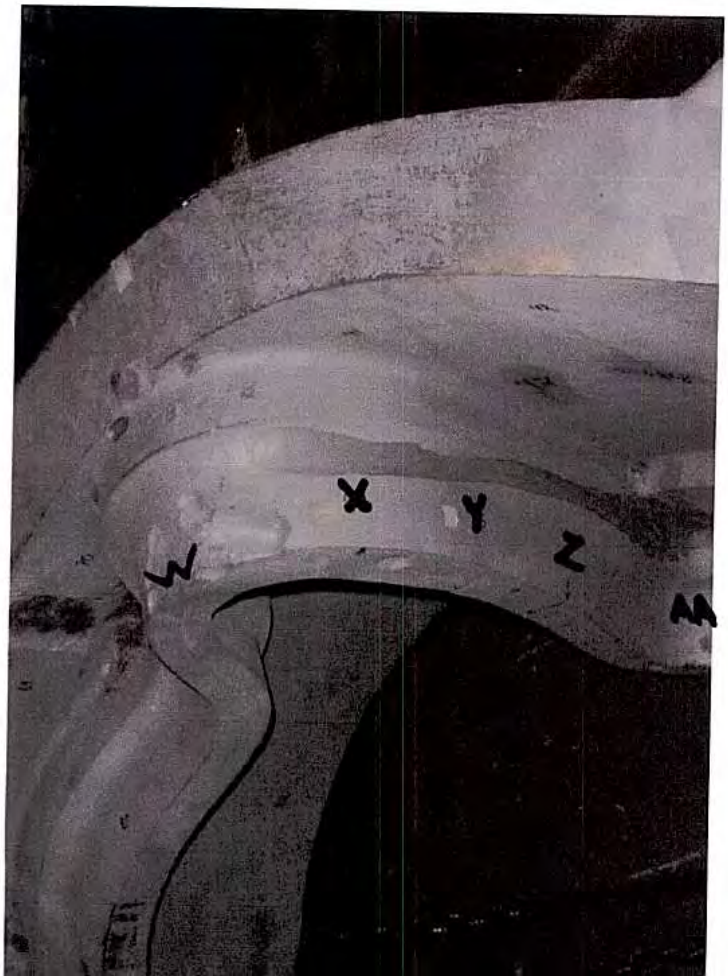
CUSTOMER Metaltek RSS # 12970 Rev.1 PART NO. MCWF-C1

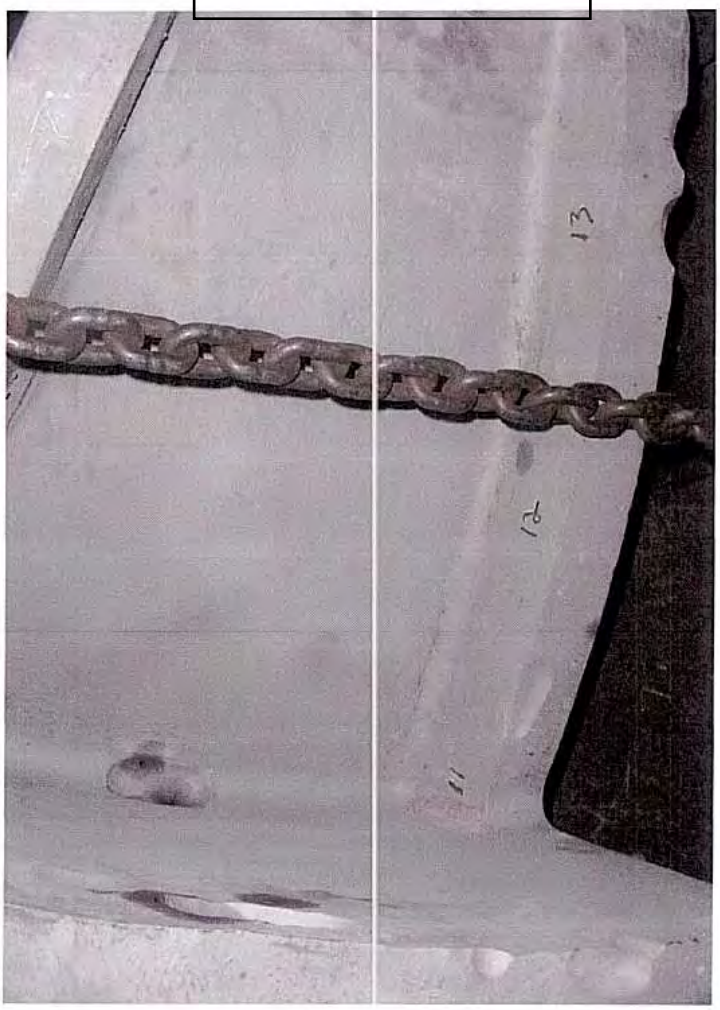
VIEW	SFD	EXP. TIME	FILM TYPE	FILM SIZE	THK. RANGE	IQI
A - B	72"	100 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
B – C	72"	100 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
C – D	72"	100 KR	AA-AA-M100	14 X 17	3" – 8"	60(2), 120(2), 140
D – E	72"	100 KR	AA-AA-M100	14 X 17	3" – 8"	60(2), 120(2), 140
E – F	72"	100 KR	AA-AA-M100	14 X 17	3" – 8"	60(2), 120(2), 140
F – G	76"	100 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
G – H	60"	67 KR	AA-M125-M100	14 X 17	3" – 6"	60(2), 80,120(2)
H – I	72"	105 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
I – J	72"	105 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
J – K	60"	67 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
K – L	60"	67 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
L – M	60"	67 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
M – N	74"	95 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
N – O	70"	90 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
O – P	64"	80 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
P – Q	62"	74 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
Q – R	60"	67 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
R – S	53"	55 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
S – T	48"	50 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
T – U	54"	55 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
U - V	65"	80 KR	AA-M100	11 X 14	3" – 6"	60(2), 120(2)
V – W	74"	110 KR	AA-M100 *	14 X 17	3" – 6"	60(2), 120(2)
W – X	74"	110 KR	AA-M100 *	14 X 17	3" – 6"	60(2), 120(2)
X – Y	72"	100 KR	AA-M100	11 X 14	3" – 6"	60(2), 120(2)
Y – Z	72"	100 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
Z - AA	72"	95 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
BB	72"	100 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
CC - DD	65"	70 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)
DD - AA	65"	70 KR	AA-M100	14 X 17	3" – 6"	60(2), 120(2)

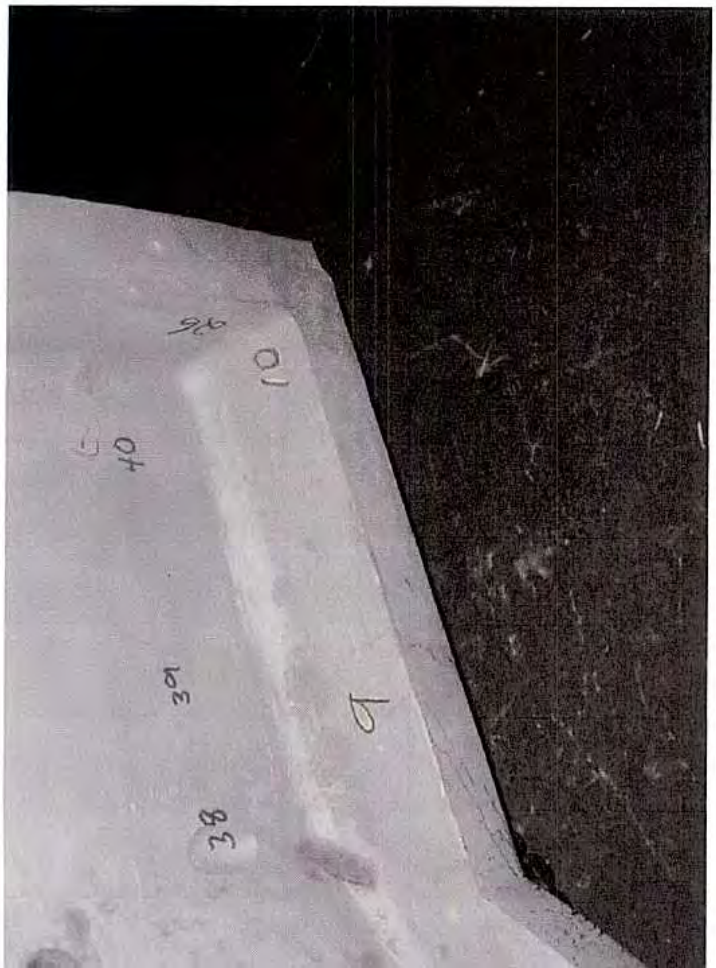
Form 20.4 - 61 Attachment A

C-1 Doc Package
Document 18a



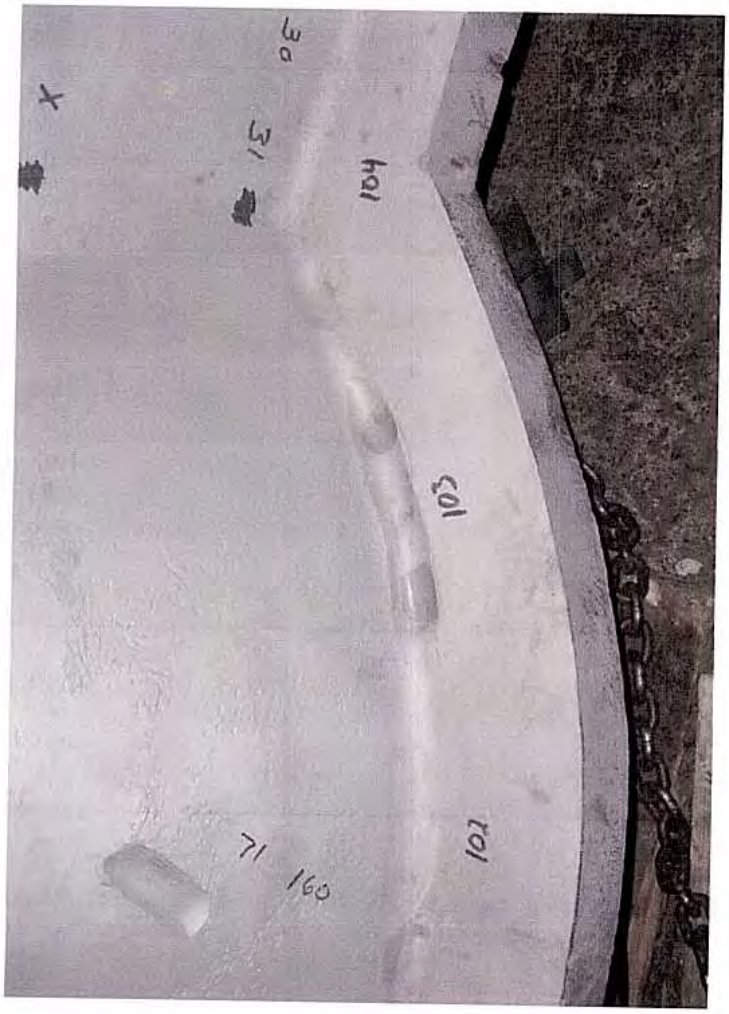







14
15


15
16
17


101
103
101
160
71
30
31


101
73
101
160
150
42
101
71

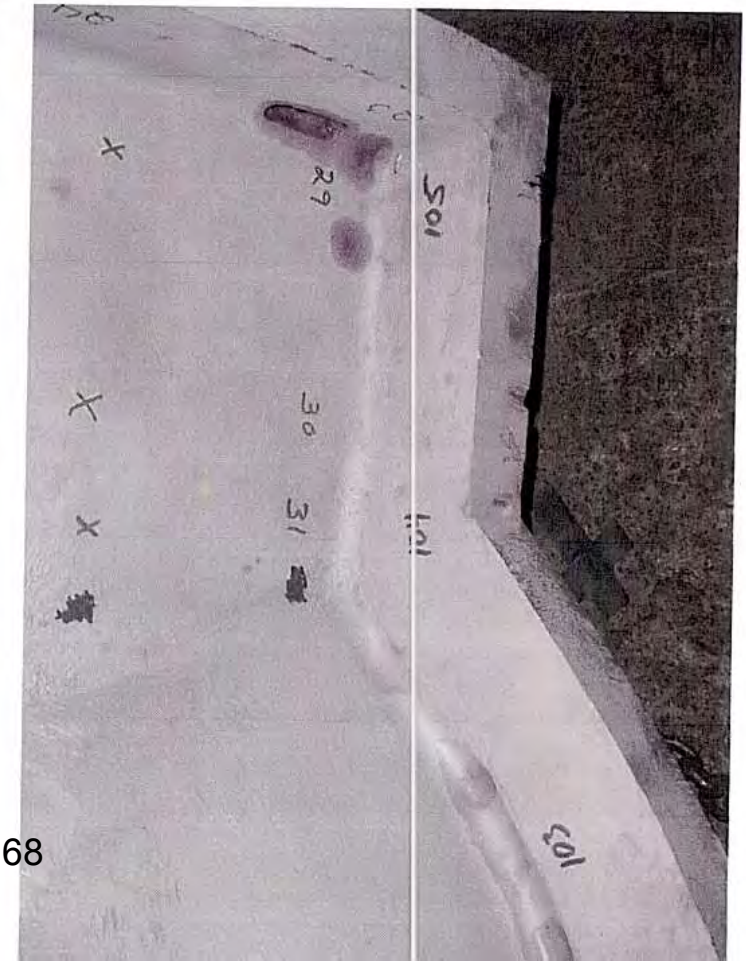

66
48

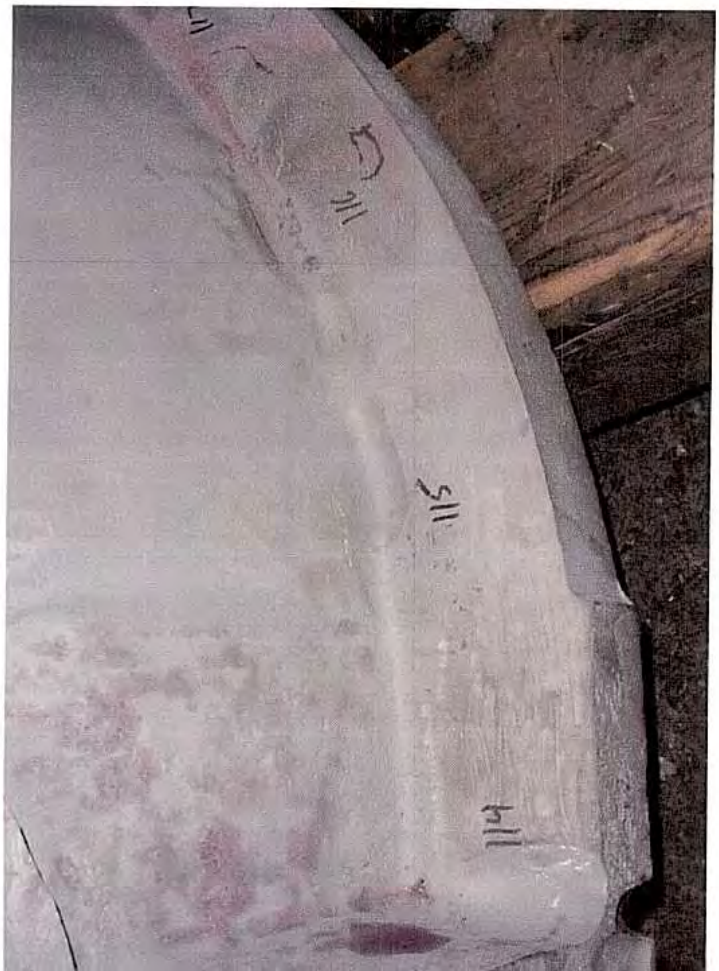

46
116
35
37
20
10

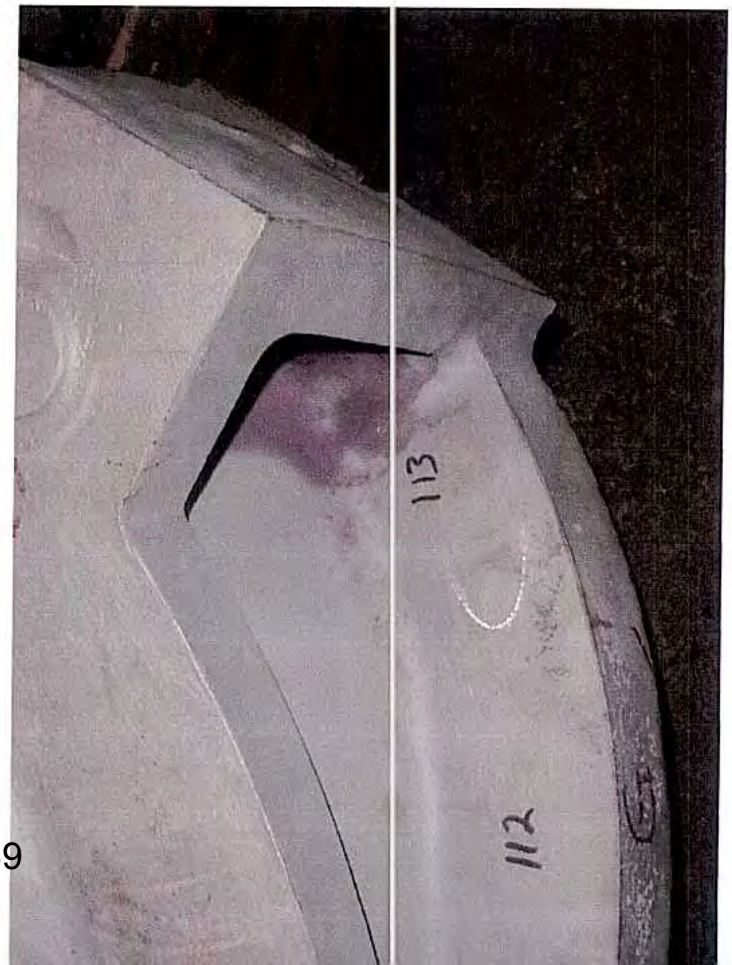

1
112
111

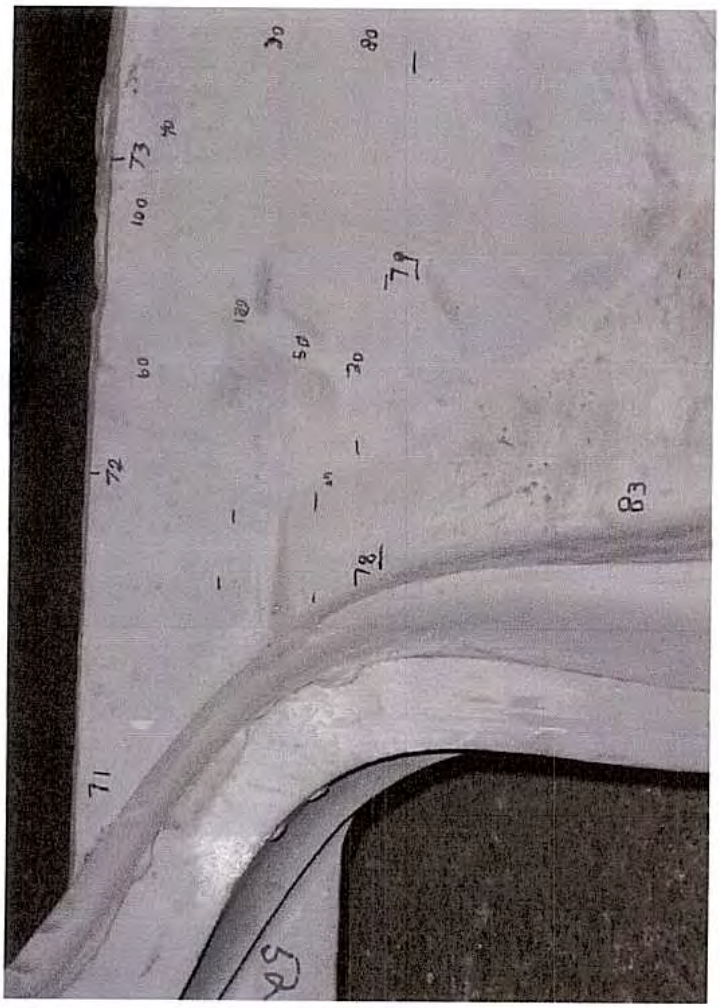

V85
109

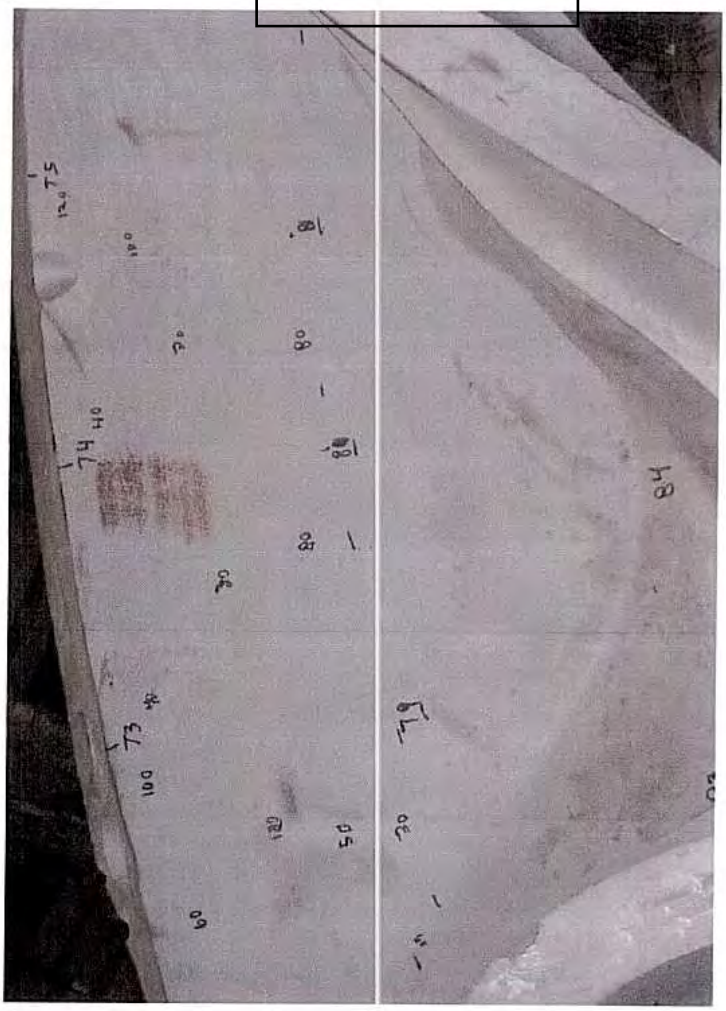

V94
110
109
108

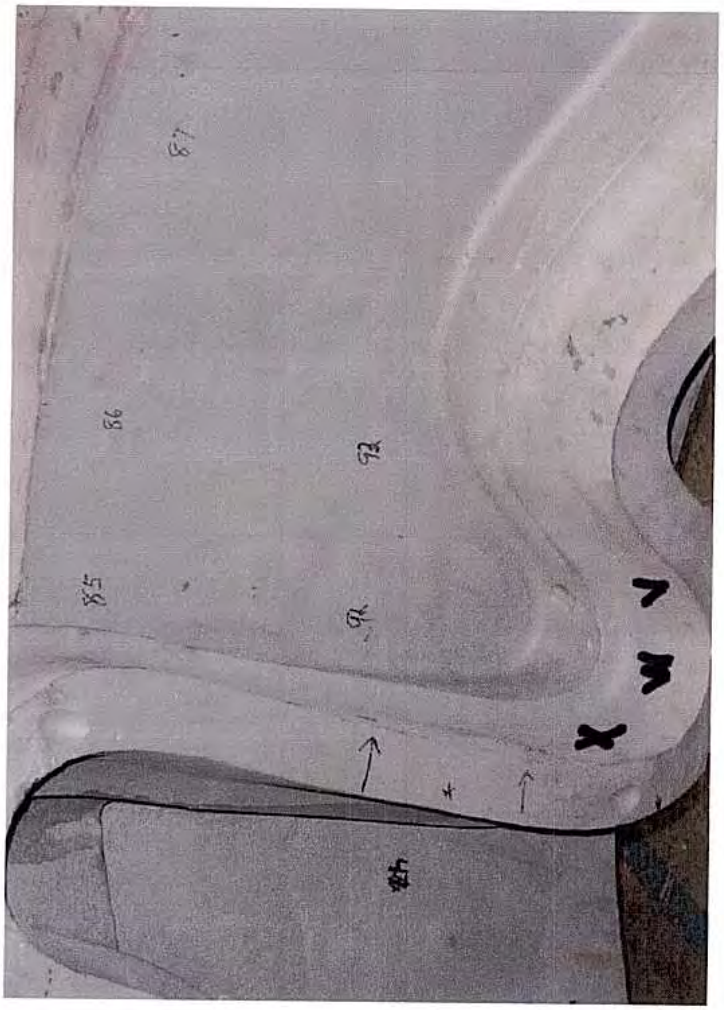

29
30
31
105
103



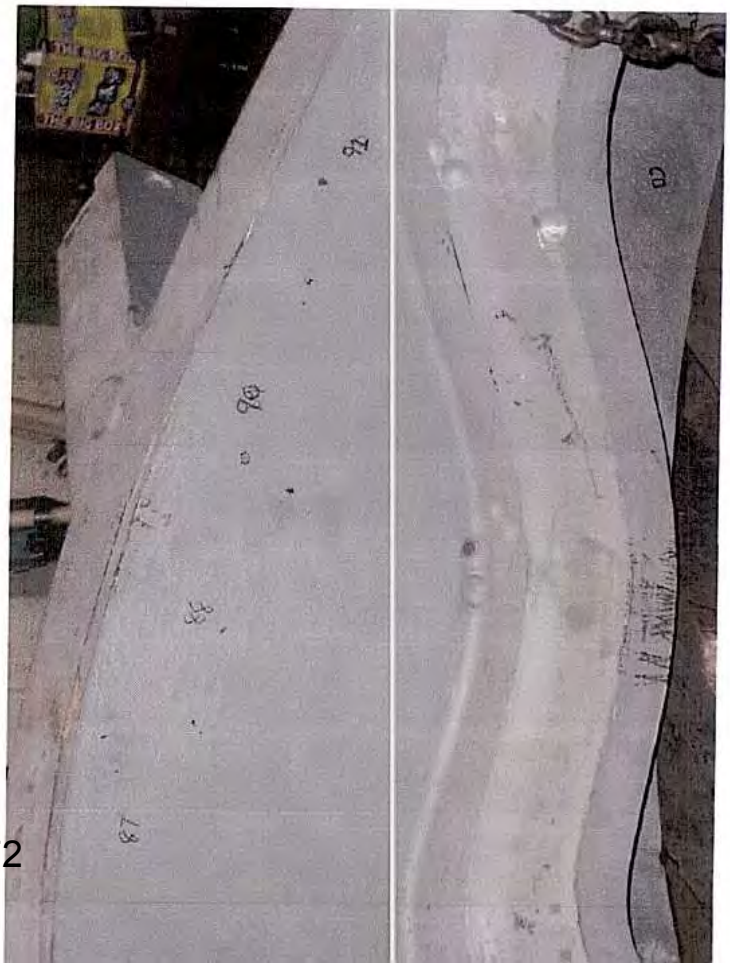


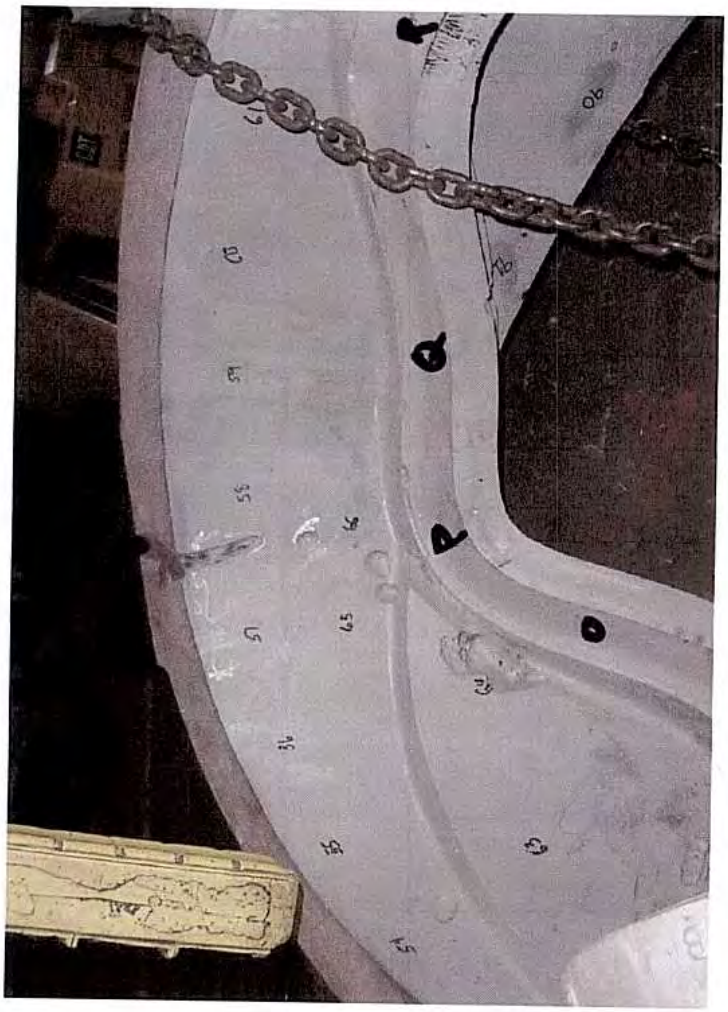


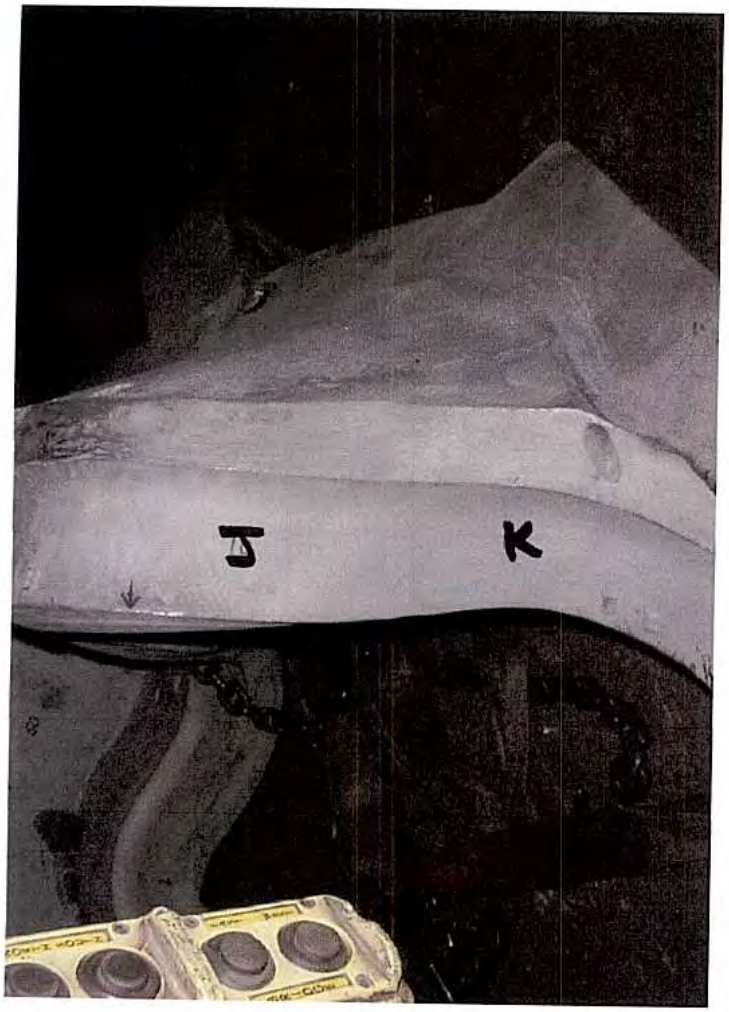


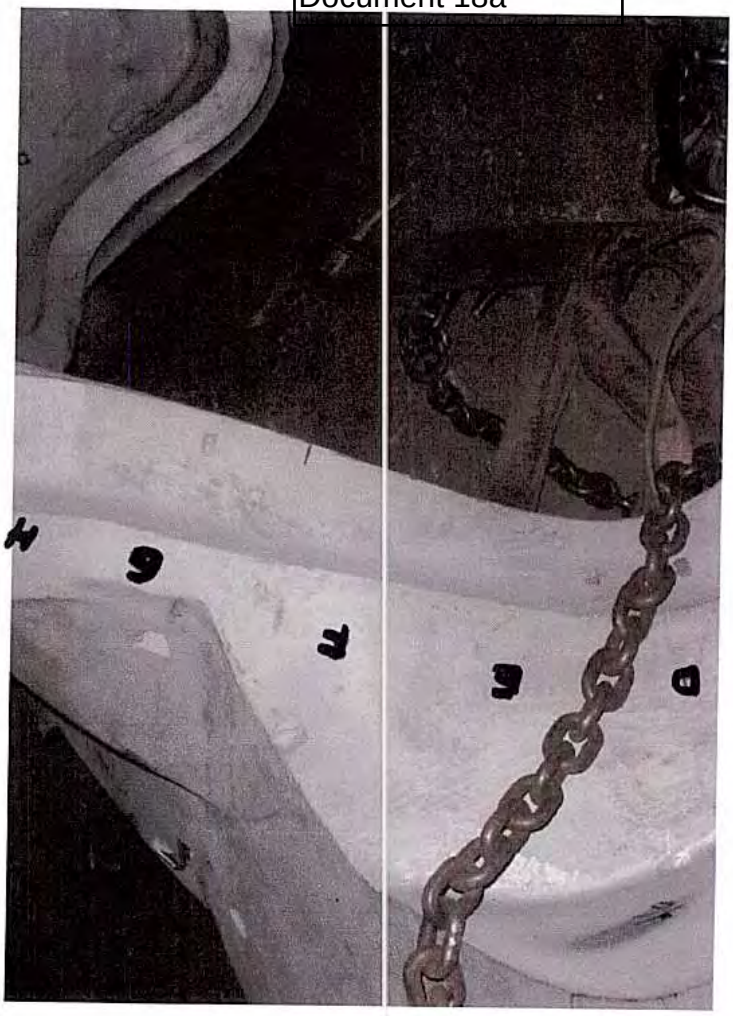



CC
DD
4






J
K


H
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D


A
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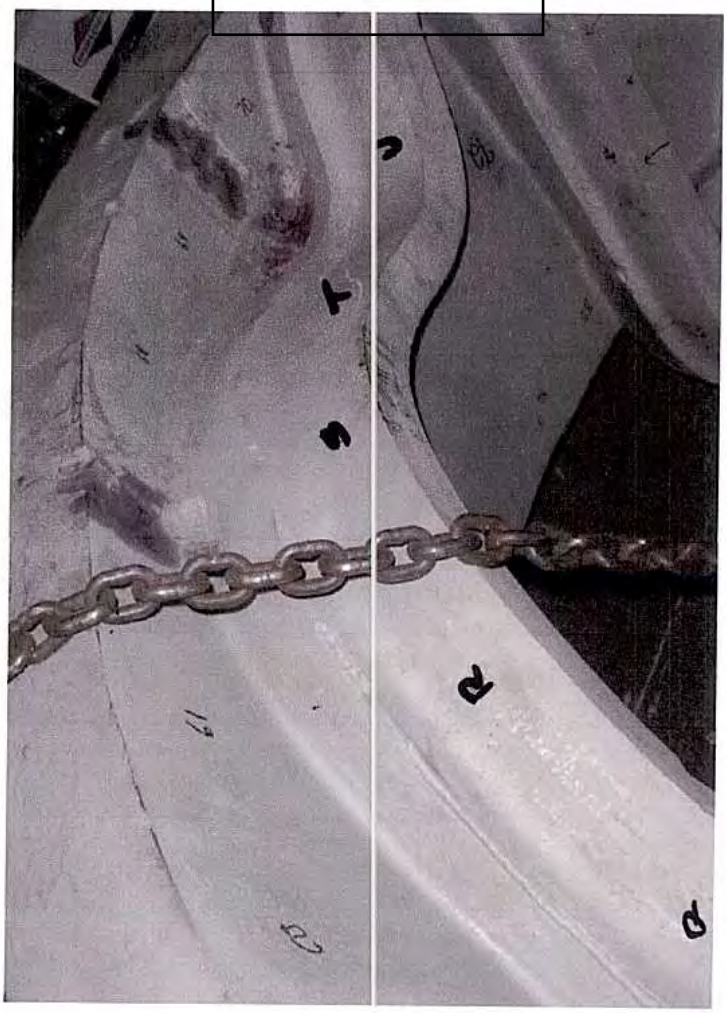
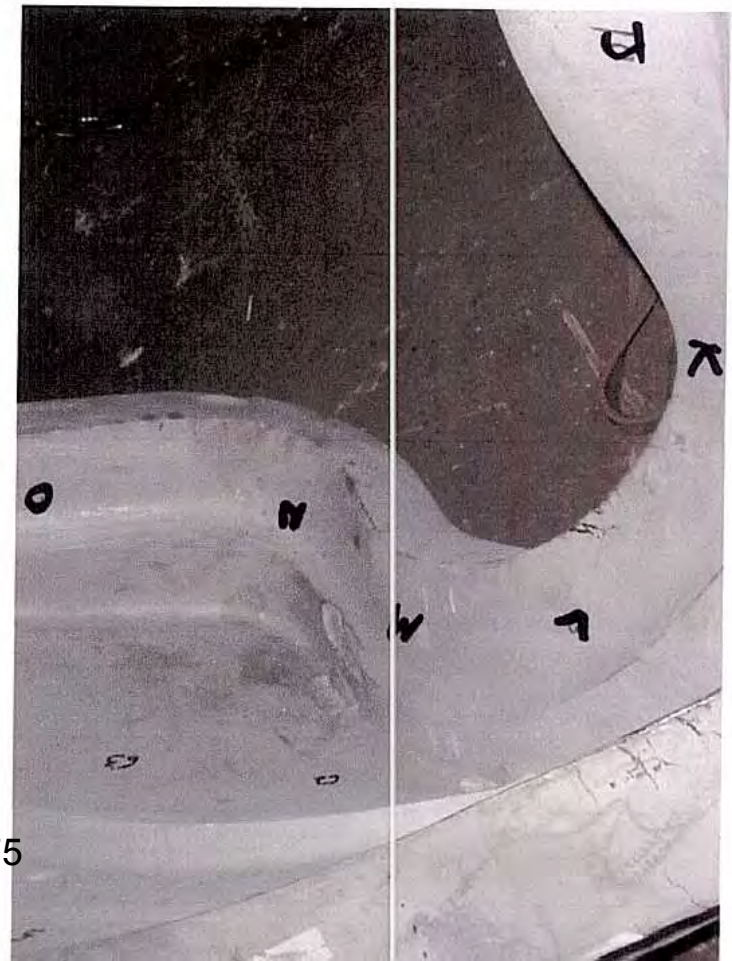
C
D

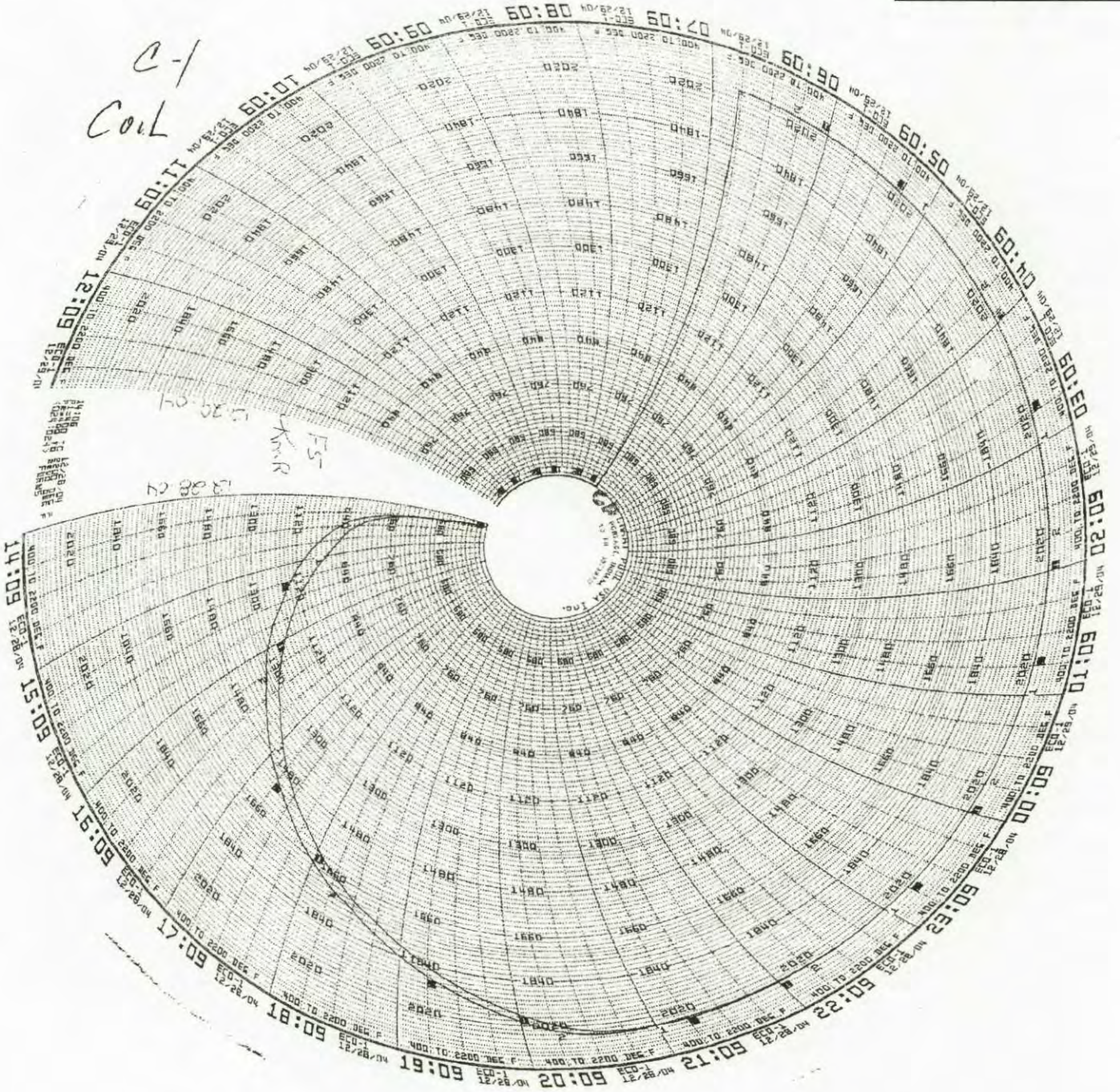

N
M
L
K
J





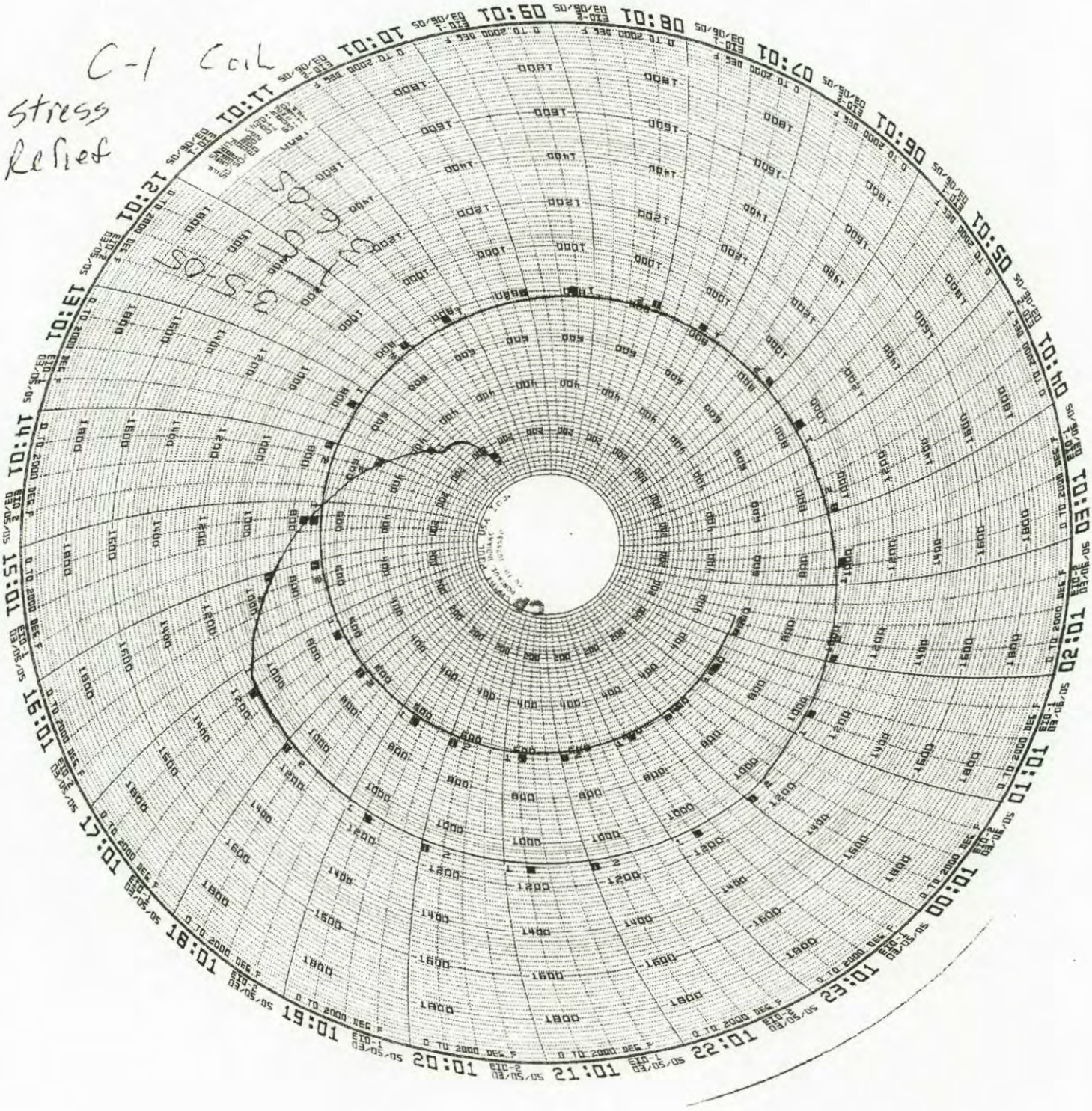
19.

C-1 Doc Package
Document #19



19A

C-1 Doc Package
Document #19A



C-1 Doc Package
Document # 20

MetalTek Corrective Action 1219

Carondelet Division - CA / PA / RGA Database

Corrective Action Type FOR CASTING DISCONTINUITIES

Date 2/18/2005

CA Originator Ruud Pattern Number: C-1 Coil

Description of Defect / Non-Conformance

96 major weld defects found in the C-1 RT1 coil casting. Two defects were on opposite sides of a wall and after excavation resulted in a through wall defect requiring repair. See CA 1226.

Root Cause : Incorrect parameter used during solidification modeling at ESI Group. They used 75% fraction solid cutoff as a feeding criterion. This made the simulation result look like the casting fed correctly with the rigging that was used.

Corrective Action: Weld upgrade C1 casting. Welding will be performed following the approved procedure FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1. FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2.

Verification of Corrective Action: All repairs will be verified by the inspection method used to discover the original defect.

Preventive Action: We used the xray information from the C1 casting to re-simulate the solidification using different fraction solid cutoff numbers. A good correlation between the C1 xray results and a 50% fraction solid cutoff number was found. As of 2-18-05, we are revising the rigging to give good simulated results with a 50%fraction solid cutoff.

Verification Of Preventative Action: Radiograph C-2 coil and compare results.

Estimated Implementation Date: Prior to shipment.

Signed: CA Ruud

CC: EIO, Barry Craig, Joe Edwards, E.J. Kubick, Geoff Mergel, File

C-1 Doc Package
Document # 20

Corrective Action 1219

Concur:

_____

P. Heitzenroeder, PPPL Tech. Rep.

_____

B. Nelson, RLM

cc: F. Malinowski, PPPL QA

C-1 Doc Package
Document # 21

MetalTek Corrective Action 1226

Carondelet Division - CA / PA / RGA Database

Corrective Action Type FOR CASTING DISCONTINUITIES

Date 2/18/2005

CA Originator Ruud Pattern Number: C-1 Coil

Description of Defect / Non-Conformance

Two defects were on opposite sides of a wall and after excavation resulted in a through wall defect requiring repair.

Root Cause : Incorrect parameter used during solidification modeling at ESI Group. They used 75% fraction solid cutoff as a feeding criterion. This made the simulation result look like the casting fed correctly with the rigging that was used.

Corrective Action: Weld upgrade C1 casting. Welding will be performed following the approved procedure FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1. FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2. Copper backing plates will used.

Verification of Corrective Action: All repairs will be verified by the inspection method used to discover the original defect.

Preventive Action: We used the xray information from the C1 casting to re-simulate the solidification using different fraction solid cutoff numbers. A good correlation between the C1 xray results and a 50% fraction solid cutoff number was found. As of 2-18-05, we are revising the rigging to give good simulated results with a 50%fraction solid cutoff.

Verification Of Preventative Action: Radiograph C-2 coil and compare results.

Estimated Implementation Date: Prior to shipment.

Signed: CA Ruud

CC: EIO, Barry Craig, Joe Edwards, E.J. Kubick, Geoff Mergel, File

C-1 Doc Package
Document # 21

Corrective Action 1226

Concur:

_____

P. Heitzenroeder, PPPL Tech. Rep.

_____

B. Nelson, RLM

cc: F. Malinowski, PPPL QA

C-1 Doc Package
Document # 22

MetalTek Corrective Action 1251
Carondelet Division - CA / PA / RGA Database

Corrective Action Type FOR CASTING DISCONTINUITIES
Date 3/22/2005
CA Originator Ruud Pattern Number: C-1 Coil

Description of Defect / Non-Conformance
Two major weld defects found following verification of weld repairs. Lack of fusion was found. These are repairs of existing weld deposits.

Root Cause
Defective weld.

Corrective Action
Excavate and repair.

Verification of Corrective Action
Radiography indicated part was properly repaired.

Actual Completion and File Date: 3-22-05

Signed: CA Ruud

CC: Barry Craig, Dean Berger, E.J. Kubick, R Suria, File

CONCUR:

3/26/05

C-1 Doc Package
Document # 22a

MetalTek
Carondelet Division - CA / PA / RGA Database

Corrective Action 1252

Corrective Action Type FOR CASTING DISCONTINUITIES
Date 3/24/2005
CA Originator Ruud

Pattern Number: C-1 Coil

Description of Defect / Non-Conformance
Major defects were observed during final Penetrant inspection.

Root Cause
Inherent casting discontinuities.

Corrective Action
Excavate discontinuities and weld repair.

Verification of Corrective Action
Penetrant Inspection of weld repairs.

Actual Completion and File Date: 3-24-05

Signed: CA Ruud

CC: Barry Craig, Dean Berger, E.J. Kubick, R Surla, File

APPROVED: 25 MARCH 2005

28 March 05

MetalTek INTERNATIONAL

C-1 Doc Package
Document # 22b

Corrective Action 1320
Carondelet Division - CA / PA / RGA Database
Corrective Action Type NCR
Date 7/5/2005
CA Originator C. Ruud
Pattern Number: C 1, C2 and A1 Coil castings

Description of Defect / Non-Conformance

Lack of test material in violation of paragraph 4.2.2.4 Additional Test Material.

Root Cause

Specification was not communicated to Pattern shop personnel.

Corrective Action

Test coupons were added to pattern and will be cast on all future coils.

Verification of Corrective Action

Pattern was inspected prior to molding C-4 casting.

Preventive Action

Create Inspection and Test Plan summarizing all requirements.

Actual Completion Date

Complete.

Signed: C. Ruud

CC: Roger Broman, Barry Craig, Joe Edwards, E.J. Kubick

PPPL and EIO agree that additional test material is not available for the C1, C2, and A1 castings, but will be provided for the remaining castings.

This NCR is approved based on EIO's corrective action and the above agreement.

_____

Brad Nelson, NCSX Core Systems Engineering Manager

_____

Phil Heitzenroeder, NCSX MCWF Subcontract Tech. Rep.

MetalTek INTERNATIONAL

C-1 Doc Package
Document # 23

Corrective Action 1300
Carondelet Division - CA / PA / RGA Database
Corrective Action Type NCR
Date 5/29/2005
CA Originator C. Ruud
Pattern Number: C-1 Coil

Description of Defect / Non-Conformance
Failed to differentiate test material on pattern/casting per the requirement of NCSX-CSPEC-141-03-07, SECTION 4.2.2.

Root Cause
Failed to communicate specification to Pattern Shop to add location identifiers to cast on test material specimens.

Corrective Action
Add location identifiers to pattern and track through testing.

Verification of Corrective Action
Verified on Coil C-2 those identifiers were present.

Preventive Action
Create Inspection and Test Plan summarizing all requirements.

Estimated Completion Date
Identifiers will be added prior to making C-2. Inspection plan by 6/15/05

Actual Completion Date
Identifiers were added 4-15-05.

Signed: C. Ruud

CC: Roger Broman, Barry Craig, Joe Edwards, E.J. Kubick

Accepted. CA for future castings. 6-6-05

Accept ~~this~~ as is for C1.

MetalTek INTERNATIONAL

C-1 Doc Package
Document # 24

Corrective Action 1301
Carondelet Division - CA / PA / RGA Database
Corrective Action Type NCR
Date 5/29/2005
CA Originator C. Ruud
Pattern Number: C-1 Coil

Description of Defect / Non-Conformance
Failed to differentiate two directions of test material on pattern/casting per the requirement of NCSX-CSPEC-141-03-07, SECTION 4.2.2.

Root Cause
Failed to communicate specification to Pattern Shop to add cast on test material specimens in the transverse direction.

Corrective Action
Will request a deviation to eliminate requirement.

Verification of Corrective Action
N/A

Preventive Action
Create Inspection and Test Plan summarizing all requirements.

Estimated Completion Date
6/15/05

Actual Completion Date

Signed: C. Ruud

CC: Roger Broman, Barry Craig, Joe Edwards, E.J. Kubick

Accept As-Is. NCSX-CSPEC-141-03-07 is being revised to eliminate the requirement to test in 2 directions. 6-6-05 PM

Nonconformance Report: CA 1323 (phosphorus levels exceeds specification limits for castings C1- C4 and A1 and C1 shim and four Type C and six A coil shims)

Project Disposition:

The erroneous levels were due to calibration errors with the spectrometer. As reported in MTK's attached report, preventive maintenance has since been performed on the spectrometer. The reported chemistry will be accepted for the castings and shims noted above. The specification chemistry will not be changed at this time.

Approvals:

Phil Heitzenroeder

Digitally signed by Phil Heitzenroeder
DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. Division
Reason: I egree to 'specified' portions of this document
Date: 2006.02.21 11:49:56 -05'00'

Procurement Technical Representative

Brad Nelson

Digitally signed by Brad Nelson
DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov
Date: 2006.02.21 14:16:12 -05'00'

Responsible Line Manager:

Corrective Action 1323
Carondelet Division - CA / PA / RGA Database
Corrective Action Type NCR
Date 7/27/2005
CA Originator C. Ruud
Applies to: Coil castings C-1, C-2, C-3, C-4 and A-1 and C 1 shim and four C coil and six A coil shims

Description of Defect / Non-Conformance
Phosphorus levels in material produced to date exceed specification limits. Both phosphorus and sulfur readings reported erroneously in certifications.

Certification reports have shown phosphorus and sulfur levels in the <.01% range. Independent laboratory data confirmed phosphorus in the .018 to .033% range and sulfur in the .005 to .022% range. Actual levels of some tests are above those in PPPL Specification NCSX-CSPEC-141-03-07 Rev 7.

Nonconformance was first suspected as a result of analysis of zoned attached test specimens volunteered by MetalTek International as response to PPPL questions on weighted average chemical analysis and quality of blending in the gating system. Nonconformance was verified on the bars used in the study and has been extended to evaluation of previously poured products.

Root Cause
Specification limits were set below the levels achievable through use of available raw materials. Spectrometer did not properly calibrate for phosphorus and sulfur at levels of specification due to equipment malfunction.
The chemical specification of EIO heats uses alloy CF8MNMn-Mod which incorporates a type standard calibration with a certified reference material (CRM) BS180. This enables the operator of the spectrometer to match the elemental concentrations of this alloy with corrective factors. These factors are determined by analyzing the CRM and having them compared with the calibration curves for each element. The phosphorus and sulfur content have very low measured intensities due to low concentrations. Intermittent failure of the spectrometer intensity measuring card caused higher intensity readings for phosphorus and sulfur. Subsequent checks with the CRM resulted in low corrective factors that were not detected. This in turn resulted in low reported concentrations for the EIO samples. All the major elements, which are measured on other intensity cards, have been closely monitored and matched very well with the CRM and thus were reported correctly.

Corrective Action
Modification to specification for phosphorus and sulfur will be requested. Limits will be set based on process capability and consistent with other stainless steel grades.
Replacement of deficient card in spectrometer will be made upon delivery.

Subsequent immediate analysis of chemistry results, obtained by wet analysis, is attached and demonstrate top of specification for sulfur and over specification for phosphorus. The spectrometer manufacturer has performed an analysis to determine the cause of the malfunction and verified that the intensity card has an intermittent fault and must be replaced. The card has been ordered and scheduled for replacement on August 15, 2005.
Until the card is replaced we will be performing additional type standardizations to ensure accurate sulfur and phosphorus analysis. Additionally, for coils made until the card is replaced, an independent laboratory will perform a verification of the chemical analysis.

Verification of Corrective Action
Will be determined at a later date.

Preventive Action
In addition to spectrometer faults, we have identified that the specification ranges for sulfur and phosphorus is unattainable. Analysis and specifications for virgin charge materials predict sulfur at 0.040% maximum and phosphorus at 0.040% maximum. We have no way to remove phosphorus from the melt and do not intentionally add phosphorus. So, the confirmed coil analyses, along with analyses of virgin material heats, demonstrate sulfur in the range of 0.010% to 0.022% and phosphorus in the range of 0.018% to 0.033%. These results are consistent with our charge material analysis. We will request a deviation for phosphorus in the subject parts and also request a permanent specification change to 0.040% maximum for both phosphorus and sulfur, to allow us to provide non-discrepant material. This change will not affect, in any way, the physical properties or material performance because all coils and test material exhibited sulfur and phosphorus within the new ranges despite inaccurate reporting.
Other actions: Specifications have been added to the BS 180 standard and the type standard will be measured against the criteria.

Estimated Completion Date
August 15, 2005

Actual Completion Date TBD

Signed: C. Ruud 

CC: Jim Galaske, Barry Craig, Joe Edwards, E.J. Kubick

Guide to St Louis Testing Report Dated 7-26-05

Sample name	Sample origin
A1Z1	Cast on bar A-1 coil, zone 1
A1Z2	Cast on bar A-1 coil, zone 2
A1Z3	Cast on bar A-1 coil, zone 3
C1	Cast on bar C-1 coil
C2Z1	Cast on bar C-2 coil, zone 1
C2Z2	Cast on bar C-2 coil, zone 2
C2Z3	Cast on bar C-2 coil, zone 3
C3Z1	Cast on bar C-3 coil, zone 1
C3Z2	Cast on bar C-3 coil, zone 2
C3Z3	Cast on bar C-3 coil, zone 3
F1	Final analysis button from ladle for C-4 coil
F2	Final analysis button from ladle for C-4 coil
F3	Final analysis button from ladle for C-4 coil
P1	Preliminary analysis button from ladle for C-4 coil

Testing is underway of the heat used to pour the four C coil and six A coil shims.

Attachment 40
CA 1323

Founded 1929 St. Louis Testing Laboratories INCORPORATED

Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.

July 26, 2005
Lab No. 05C-0608
Invoice No. 59891
P.O. No. 21324
Page 1 of 1

METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

Attention: Chuck Ruud

REPORT OF CHEMICAL ANALYSIS

SAMPLE ID: A1 Z1, A1 Z2, A1 Z3, C1, C2 Z1, C2 Z2, C2 Z3, C3 Z1, C3 Z2, C3 Z3, F1, F2, F3, P1

RESULTS: %

ANALYTE	A1Z1	A1Z2	A1Z3
Sulfur	.013	.005	.010
Phosphorus	.025	.023	.018

ANALYTE	C1	C2Z1	C2Z2	C2Z3
Sulfur	.014	.022	.018	.015
Phosphorus	.018	.024	.021	.025

ANALYTE	C3Z1	C3Z2	C3Z3
Sulfur	.013	.014	.012
Phosphorus	.024	.025	.021

ANALYTE	F1	F2	F3	P1
Sulfur	.014	.015	.012	.010
Phosphorus	.029	.033	.028	.030

Sulfur Test Method: ASTM E1019-03

Phosphorous Test Method: Colormetric

Identification of tested specimen provided by the client.

Robin E. Sinn
Laboratory Director

RES/nmc

Coil

25

RIG

Energy Industries of Ohio
Manufacturing and Test Sequence (MTS) Serial Number C-1

CO# 40851, ~~MS73140~~ Dated December 14, 2004 Revision:Original **Page 1 of 8** **Dated Issued:12-14-04**

OPER. #	STATION	DESCRIPTION OF PROCESS	Name	Date
10	QUALITY RELEASE	REVIEW AND APPROVE MTS. RECEIVED APPROVAL FROM EIO ON 12/15/04 FROM Pete SIGNED QUALITY MANAGER	CBL	12/15/04
15	PATTERN NPAT SOP 0100REV2	APPLY APPROPRIATE PART NUMBER, SERIAL NUMBER, FOUNDRY MARK, TO THE PATTERN. CAST ON BARS REQUIRED. Cast-on bars added - Marked "C1" - Part Number, etc., will have to be stamped	RB	12/17/04
20	COREMAKE CORE SOP 0100 REV 6 CALIBRATION PER CORE SOP 0200R4/0300R6	MAKE CORES IN SAND MIXTURES AS DESCRIBED BY METALTEK ENGINEERING AND VERIFIED IN MODELING TRIALS. METALTEK CORE SOP 0100 REV 6) CORE WASH WITH ZIRCONIUM CORE WASH (CALIBRATION OF EQUIPMENT REQUIRED PER CORE SOP 0200,R4 / 0300,R6) VERIFY COUNT AND INSPECT.		12-17-04
30	MOLD MOLD SOP 0400 REV 8 CALIBRATION PER MOLD SOP 0900 REV 5 PREPARATION PER MOLD SOP 1100R2/1200R2/1300R1 SAND TESTING PER MOLD SOP 1400R2/1500R3/1600R2	MOLD PER WORK INSTRUCTIONS IN MAPICS ROUTING AND SOPS REFERENCED. ENGINEER OF RECORD – ROGER BROMAN, CONSULT ON MOLD-RELATED CONCERNS. MOLD MATERIALS REQUIRED PER MAPICS BOM. NOTIFY ENGINEER OF ANY SUBSTITUTIONS.		12-17-04
40	POUR MELT SOP 0100R5 MELT SOP 0700R2 MELT SOP 0600R2	METAL MUST BE AOD REFINED OR AOD INGOT. VIRGIN METAL ADDITIONS ALLOWED. RECORD POURING TEMPERATURE: 2750 CASTING POURED AT: 5:3[illegible] DATE: 12/20/04 HEAT #'s: 27728, 27729, 27730, 27731 ELAPSED POUR TIME 105 SEC KEEL BLOCKS POURED: YES Sample from ladle to be analyzed for final chemical analysis and reported on material certifications. Sample Taken by: JG Analyzed: J.Gabbake Date: 12-19-04		12/19/04 BR 12-26-04 SIGNED WRONG BOX CJA 12-26-04
50	MELT SOP 0800R2	SHAKEOUT	CJA	12-26-04

C-1 Doc Package
Document #25
10 pages

Energy Industries of Ohio
Manufacturing and Test Sequence (MTS) Serial Number C-1
CO# 40851, MS73140 Dated December 14, 2004 Revision:Original **Dated Issued: 12-14-04**

60	ARC RISE SOP 0100R1	REMOVE RISERS AS DIRECTED BY SUPERVISOR. ARC CUT OFF HIGH FOR HT 12-23 04	MW MW	1-3-05
70	HEAT TREAT HEAT SOP 0103R5	SOLUTION ANNEAL. MAKE SURE TO BLOCK ALL FLANGES OF FORM AND RACETRACK TO MINIMIZE CREEP DISTORTION.	DLS F5-1	12/28/04
75	PHYSICAL TESTING	OBTAIN TEST SPECIMENS AND SUBMIT FOR PHYSICAL TESTING. REPORT RESULTS AS PART OF STEP 510.	WH	12/28/04
80	GRIND GSWA SOP 0100R3 GCHI SOP 0100R2	SWING GRIND TO REMOVE RISER REMAINS AND FLASH IF REQUIRED. CHIP AND HAD GRIND SURFACE OF PART AS REQUIRED FOR CONTOUR.	SR MG TV	1-2-05 1-6-05 1-6-05
90	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.	MTW	1-7-05
110	VISUAL INSPECTION CQP-500 REV 4	VISUALLY INSPECT 100% of COMPONENT ACCORDING TO ASTM A802 LEVEL 3 ALL CONDITIONS. IF OK CHECK HERE ____ IF REJECTED CHECK HERE X. MARK AND REPAIR AT STEP 120.	VT - LEVEL II	1-7-05
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF LP STEP. EIO NOTIFIED ON 1/3/05 DCMA NOTIFIED ON 1/3/05 +or- 1/4/05 for no earlier than 1/7/05	Q ENG OR QA MGR	CAZ
115	100% L.P. CQP 0300 REV 10	L.P. 100% OF COMPONENT. ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING. IF OK CHECK HERE ____ IF REJECTED CHECK HERE X MARK AND REPAIR AT STEP 120.	LP - LEVEL II KRA 1-7-05	1/7/04
120	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING 100% VISUAL AND LP INSPECTION.	ZP	1-10-05
130	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING.	LP - LEVEL II	delayed CAZ pending X Ray
165	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.	MTW	1-12-05
170	WELD MAP	MAP ALL WELDS WITH DIGITAL PHOTO/MAPS. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION [illegible] MAN OR THEIR DESIGNEE, FILE WITH QA. USE YELLOW MARKER	weld test after RT	CAZ

		MUST SEND REPORT ON ALL WELDS OVER 10% OF NOMINAL WALL THICKNESS TO CUSTOMER. DEFECTS>10% YES _____, REPORT SENT BY _____ DATE_____ DEFECTS < 10 % _____ SIGN BY QA ENG.	N/A	
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF XRAY AND DIMENSIONAL STEPS. EIO NOTIFIED ON 1/11/05 DCMA NOTIFIED ON 1/13/05	Q ENG OR QA MGR	1/13/05
180	HOLD POINT	HOLD FOR APPROVAL OF XRAY PROCEDURES. RECEIVE APPROVAL FROM EIO ON 1/11/05 from R.D	QA MGR	
190	X-RAY AT MQS MQS PROCEDURE 20.11.010 REV 0	X-RAY PER TECHNIQUE # 12726 USE CALIBRATED DENSITOMETER FOR DENSITY VERIFICATION. WHEN MARKING USE BLACK MARKERS. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET.	RT – LEVEL II	out to MQS 1-12-05
200	LAYOUT Lawton's procedure	INSPECT CASTING TO VERIFY DIMENSIONS. THIS MAY BE PERFORMED BEFORE OR AFTER STEP 190. DIMENSIONED 1/10 + 11/05 DATE by 3D SCAN RELEASED See 3D Scan Report (ENGINEER ONLY)		1/11/05
210	X-RAY CQP 401 REV 5	X-RAY INTERPRETATION. ACCEPTANCE MSS SP 54. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET. IF OK CHECK HERE _____ AND SEND TO STEP 370. REJECTED CHECK HERE ✓ MARK UP DEFECTS AND SEND THE CASTING TO STEP 260.	RT – LEVEL II EBK	1-19-05 1/25/05
220	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING RADIOGRAPHY.		1-19-05 1/25/05
230	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING.	LP - LEVEL II CC	2-17-5
240	WELD MAP	MAP ALL WELDS WITH DIGITAL PHOTO/MAPS. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE, FILE WITH QA.. MUST SEND REPORT ON ALL WELDS OVER 10% OF NOMINAL WALL THICKNESS TO CUSTOMER. DEFECTS>10% YES ✓, REPORT SENT BY R Soria DATE 2/18/05 DEFECTS < 10 % SIGN BY QA ENG.		2/18/05
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF WELD STEP. EIO NOTIFIED ON 1/11/05 DCMA NOTIFIED ON 1/11/05	Q ENG OR QA MGR	1/11/05
260	QA APPROVAL HOLD POINT	QA TO APPROVE ELECTRODE PRIOR TO USE. CF Supplier mill Rev 1 PROCEDURE USED: 15-GMAW MATERIAL USED: LNM 414/55 QUALITY ENG. Name: Ricardo Soria Date: 2/18/05		2/18/05

270	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1 FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2		3/5/05
280	GRIND GCHI SOP 0100R2	HAND GRIND WELDS.		3/5/05
290	L.P. WELD CQP 0300 REV 10	L.P. WELD REPAIRS ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING. IF OK CHECK HERE ✓ WASH AND SEND TO STEP 300. IF REJECTED CHECK HERE _____AND RETURN TO STEP 220.	LP - LEVEL II	3/5/05
	REPEAT	REPEAT STEPS 220 TO 290 AS REQUIRED TILL CLEAR THROUGH VISUAL INSPECTION & PENETRANT INSPECTION. DOCUMENT REWORK ON A SUPPLEMENTAL MTS	QA ENG. N/A	
295	TEST MAG PERM SOP MAG PERM 100, REV 1	TEST MAG PERMEABILITY REPAIR AREAS RECORD ON WELD MAP LIST. TEST AT LEAST 5 POINTS PER WELD. ACCEPTANCE 1.02. IF OK CHECK HERE X AND GO TO STEP 430. IF REJECTED CHECK HERE _____.		3/5/05
296	GRIND GCHI SOP 0100R2	GRIND AREAS OF NON COMPLIANCE AND RETURN TO STEP 295. REPEAT UNTILL COMPLIANCE IS ACHIEVED.	N/A	
300	X-RAY (NOTE)	IF RADIO GRAPHED AREAS ARE GREATER THAN FOUR TO FIVE INCHES THE CASTING WILL BE SENT TO MQS. SEND TO MQS CHECK HERE ✓. RADIOGRAPH AT CAF CHECK HERE _____.	QA ENGINEER	3/7/05
310 A	MQS X-RAY DEFECTS REPAIRED BY WELDING	X-RAY PER TECHNIQUE # 12726 USE CALIBRATED DENSITOMETER FOR DENSITY VERIFICATION. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET.	LEVEL II	3/20/05
310 B	CAF X-RAY DEFECTS REPAIRED BY WELDING CQP 401 REV 5	X-RAY PER TECHNIQUE # 12726 USE CALIBRATED DENSITOMETER FOR DENSITY VERIFICATION. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET.	RT - LEVEL II N/A	
320	X-RAY CQP 401 REV 5	X-RAY INTERPRETATION. ACCEPTANCE MSS SP 54. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET. IF OK CHECK HERE _____ AND SEND TO STEP 340. REJECTED CHECK HERE X MARK UP DEFECTS AND SEND THE CASTING TO STEP 220.	RT - LEVEL II RBK	3-21-05

Energy Industries of Ohio
Manufacturing and Test Sequence (MTS) Serial Number C-1
CO# 40851, MS73140 Dated December 14, 2004 Revision:Original **Dated Issued:12-14-04**

	REPEAT	REPEAT STEPS 220 TO 320 AS REQUIRED TILL WELDS CLEAR X-RAY. DOCUMENT REWORK ON A SUPPLEMENTAL MTS Supplental supplied 0.3/21/05	QA ENG.	
340	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.		3-22
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF VISUAL AND LP STEPS. EIO NOTIFIED ON 3/16/05 DCMA NOTIFIED ON 3/16/05	Q ENG OR QA MGR	
350	FINAL VISUAL INSPECTION CQP-500 REV 4	VISUALLY INSPECT 100% of COMPONENT ACCORDING TO ASTM A802 LEVEL 2 ALL CONDITIONS. IF OK CHECK HERE ✓ 3/30/05 Final OK IF REJECTED CHECK HERE ✓. MARK AND REPAIR AT STEP 390. MUST BE PERFORMED BY LEVEL II in VT.	VT - LEVEL II	3/22/05 3/24/05
360	FINAL L.P. CQP 0300 REV 10	FINAL L.P. 100% OF COMPONENT. ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA- LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING. 3/30/05 Final OK IF OK CHECK HERE ✓ WASH AND SEND TO STEP 455. IF REJECTED CHECK HERE	LP - LEVEL II	3/22/05
380	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING FINAL PENETRANT INSPECTION.	MC	3/22/05
390	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903.	LP - LEVEL II	3/23/05
400	WELD MAP	MAP ALL WELDS WITH DIGITAL PHOTO/MAPS. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE. FILE WITH QA. MUST SEND REPORT ON ALL WELDS OVER 10% OF NOMINAL WALL THICKNESS TO CUSTOMER. NOMINAL WALL THICKNESS TO CUSTOMER. DEFECTS.>10% YES ✓ REPORT SENT BY RS DATE 3/23 DEFECTS < 10 % SIGN BY QA ENG.	RS	3/24
420	GRIND GCHI SOP 0100R2	GRIND AREAS OF NON COMPLIANCE AND RETURN TO STEP 410. REPEAT UNTILL COMPLIANCE IS ACHIEVED.	N/A	
430	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1 FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2	MC	3-28-05

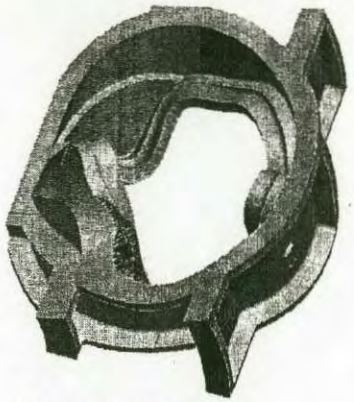
Final L.P. 3/30/05

440	GRIND GCHI SOP 0100 REV 2	HAND GRIND WELDS.	CG	3/28/05
450	L.P. WELDS CQP 0300 REV 10	L.P. WELD REPAIRS ACCEPTANCE PER ASTM A903. IF OK CHECK HERE ✓ WASH AND SEND TO STEP 460. IF REJECTED CHECK HERE _____AND RETURN TO STEP 390.	LP - LEVEL II KLA	3-30-05
	REPEAT	REPEAT STEPS 350 TO 450 AS REQUIRED TILL WELDS CLEAR FINAL LIQUID PENETRANT INSPECTION. DOCUMENT REWORK ON A SUPPLEMENTAL MTS	QA ENG NA	
451	TEST MAG PERM SOP MAG PERM 100, REV 1	TEST MAG PERMEABILITY REPAIR AREAS. RECORD ON WELD MAP LIST. TEST AT LEAST 5 POINTS PER WELD. ACCEPTANCE 1.02. IF OK CHECK HERE ✓ AND GO TO STEP 430. IF REJECTED CHECK HERE _____.	CSA	3/28/05
452	GRIND GCHI SOP 0100R2	GRIND AREAS OF NON COMPLIANCE AND RETURN TO STEP 451. REPEAT UNTILL COMPLIANCE IS ACHIEVED.	N/A	
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF LAYOUT AND MAG PERM STEPS. EIO NOTIFIED ON 3/23/05 DCMA NOTIFIED ON 3/23/05	Q ENG OR QA MGR	CM
455	~~LAYOUT~~	~~LAYOUT PRODUCTION PARTS PROCEDURE TO BE DETERMINED.(PERFORMED AFTER~~ FIRST ARTICLE APPROVAL) MAY BE PERFORMED BEFORE OR AFTER STEP 460-480.	Deleted CM	
460	FINAL MAG PERM INSPECTION SOP MAG PERM 100, REV 1	PERFORM MAG PERM TESTING WITH SEVRIN GAUGE. ACCEPTANCE 1.02. CHECK THE ENTIRE SURFACE ON A 6"BY6" GRID. REPORT RESULTS. USE A 6" SQUARE BLOCK TO INDICATE TEST LOCATIONS AND RECORD RESULTS. COMPLIANT AREAS WILL NOT BE MARKED. MARK NONCOMPLIANT AREAS WITH AN "X" FOR REPAIR. OK CHECK HERE ✓ AND GO TO STEP 490. IF REJECTED CHECK HERE _____	CM	3/30/05
470	GRIND GCHI SOP 0100 REV 2	HAND GRIND WITH SUITABLE CONE OR OTHER SIMILAR GRINDER AS REQUIRED TO ENSURE REMOVAL OF MATERIAL TO ACHIEVE MAG PERM REQUIREMENT. CIRCLE AREA REMEDIATE FOR RETEST.	N/A	
480	RETEST MAG PERM SOP MAG PERM 100, REV 1	RETEST MAG PERMEABILITY AT FAILED TEST POINTS. MARK NONCOMPLIANT AREAS WITH AN "X" FOR REPAIR. ACCEPTANCE 1.02. IF OK CHECK HERE _____. IF REJECTED CHECK HERE _____ RETURN TO STEP 470		
490	PHOTOGRAPH	TAKE DIGITAL PICTURES.	RM	3/31/05
	SAND Blast		CAP	3-31-05

500	AUDIT REVIEW	PROCESS DOCUMENT TO PROGRAM MANAGER FOR COMPLIANCE AUDIT.	3/31/05 [illegible]	
510	DOC. REVIEW	REVIEW DOCUMENTS AS REQUIRED IN CAF CHECKLIST, ALL DOCUMENTS NOTED TO BE ACCESSIBLE FOR AUDITING. (SHIPPER, C OF C, M.T.R., M.T.S., INSPECTION REPORT, X-RAY READER SHEETS AND HEAT TREAT CHARTS)	3/31/05 [illegible]	
NOTICE	RELEASE FROM EIO	PROVIDE DOCUMENTS TO EIO. SENT ON 4/4/05 BY [illegible] RECEIVED RELEASE FROM EIO ON 3/30/05	Q ENG OR QA MGR	
520	PACK AND SHIP	PACKAGE AND SHIP TO MAJOR TOOL. Shipped	3/31/05	
1000	REVISION HISTORY	ORIGINAL 12-14-04. approved 12-14-04.	CARUUD	

Page 8 of 8 Revised 1-26-05 to clarify and illustrate the critical areas (CLASS 1) of the C-1 Coil

CLASS 2 ...



GENERAL ISOMETRIC
VIEW FROM TOP SIDE

RED AREA INDICATES HIGH STRESSED AREA

TOP SIDE ISOMETRIC

TOP SIDE VIEW

BOTTOM SIDE ISOMETRIC

BOTTOM SIDE VIEW

NOTES: Weld repair of C-1 Coil Casting Date: 3-21-05				SUPPLEMENTAL ROUTING CARD		
	PART NUMBER: C-1 Coil			SERIAL NUMBER: C-1		AUTHORITY C Ruud
OPER NUMBER	STATION					OPERATOR SIGN/DATE
220	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING RADIOGRAPHY.				3/21/05
230	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING.			LP - LEVEL II SB	3/21/05
240	WELD MAP	MAP ALL WELDS WITH DIGITAL PHOTO/MAPS. SERIALIZE DEFECTS ON CASTING, USE SCALE IN PHOTOS AND DOCUMENT SIZE. THIS IS TO BE PERFORMED BY SUPERVISOR, INSPECTION LEAD MAN OR THEIR DESIGNEE, FILE WITH QA.. MUST SEND REPORT ON ALL WELDS OVER 10% OF NOMINAL WALL THICKNESS TO CUSTOMER. DEFECTS>10% YES ✓, REPORT SENT BY R Suria DATE 3/22/05 DEFECTS < 10 % _____ SIGN BY QA ENG.			RS	3/22/05
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF WELD STEP. Waived Note EIO NOTIFIED ON 3/21/05 DCMA NOTIFIED ON 3/21/05			Q ENG OR QA MGR	CBC
260	QA APPROVAL HOLD POINT	QA TO APPROVE ELECTRODE PRIOR TO USE D PROCEDURE USED: 15-GMAW-CF8MnNMO MATERIAL USED: Lincoln LNM 44/55 QUALITY ENG. Name: Ricardo Suria Date: 3/21/05				
270	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1 FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2				3/21/05
280	GRIND GCHI SOP 0100R2	HAND GRIND WELDS.				3/21/05
290	L.P. WELD CQP 0300 REV 10	L.P. WELD REPAIRS ACCEPTANCE PER ASTM A903. ACCEPTANCE CRITERIA-LEVEL 1 FOR HIGH STRESSED AREAS, LEVEL 2 FOR ALL OTHER AREAS. SEE LP DRAWING. IF OK CHECK HERE ✓ WASH AND SEND TO STEP 300. IF REJECTED CHECK HERE _____ AND RETURN TO STEP 220.			LP - LEVEL II SB	3/21/05
	REPEAT	REPEAT STEPS 220 TO 290 AS REQUIRED TILL CLEAR THROUGH VISUAL INSPECTION & PENETRANT INSPECTION. DOCUMENT REWORK ON A SUPPLEMENTAL MTS			QA ENG	N/A

S:DRIVE/MANUAL FORMS/SEI
SRC-01 REV. 0 10/28/03

101

295	TEST MAG PERM SOP MAG PERM 100, REV 1	TEST MAG PERMEABILITY REPAIR AREAS RECORD ON WELD MAP LIST. TEST AT LEAST 5 POINTS PER WELD. ACCEPTANCE 1.02. IF OK CHECK HERE ✓ AND GO TO STEP 430. IF REJECTED CHECK HERE _____.	CAL	3/31
296	GRIND GCHI SOP 0100R2	GRIND AREAS OF NON COMPLIANCE AND RETURN TO STEP 295. REPEAT UNTILL COMPLIANCE IS ACHIEVED.	N/A	
300	X-RAY (NOTE)	IF RADIO GRAPHED AREAS ARE GREATER THAN FOUR TO FIVE INCHES THE CASTING WILL BE SENT TO MQS. SEND TO MQS CHECK HERE _____. RADIOGRAPH AT CAF CHECK HERE ✓.	QA ENGINEER	DWM 3-21-05
310 A	MQS X-RAY DEFECTS REPAIRED BY WELDING	X-RAY PER TECHNIQUE # 12726 USE CALIBRATED DENSITOMETER FOR DENSITY VERIFICATION. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET.	LEVEL II N/A	
310 B	CAF X-RAY DEFECTS REPAIRED BY WELDING CQP 401 REV 5	X-RAY PER TECHNIQUE # 12726 USE CALIBRATED DENSITOMETER FOR DENSITY VERIFICATION. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET.	RT - LEVEL II	DWM 3-21-05
320	X-RAY CQP 401 REV 5	X-RAY INTERPRETATION. ACCEPTANCE MSS SP 54. ATTACH TECHNIQUE, READER SHEET FOR ALL RADIOGRAPHS. MUST INDICATE RADIOGRAPHER AND ASNT CERTIFICATION LEVEL ON READER SHEET. IF OK CHECK HERE ✓ AND SEND TO STEP 340. REJECTED CHECK HERE _____ MARK UP DEFECTS AND SEND THE CASTING TO STEP 220.	RT - LEVEL II	

11/26/04
Rev. 01

C-1 Doc Package
Document #26

26

EIO
Energy Industries of Ohio
SUPPLIER QUALITY RELEASE

Date: 3/30/05

I. General Information:	
Project Name	Modular Coil Winding Form C1 + Shim Ctg. Rev
PO No	NCSX SOW 141 02 01
Supplier	MetalTech
Procurement Agent:	EIO
Shipment:	☒ Partial ☐ Final

II. Material Description

Casting C1 Coil

III. Release Checklist		
Plan Requirements Complete?	☐ Yes ☒ No ☐ N/A	(If identified "No" provide explanation in comments section below)
Variances?	☒ Yes ☐ No ☐ N/A	(If identified "No" provide explanation in comments section below)
Princeton Notified of Shipment?	☒ Yes ☐ No ☐ N/A	(If identified "No" provide explanation in comments section below)
DCMA Notified of Shipment?	☒ Yes ☐ No ☐ N/A	(If identified "No" provide explanation in comments section below)
☒ Conditional ☐ Unconditional	Explain conditional releases in comments section.	

IV. Comments:

Metallurgical testing pending, unable to complete prior to shipment.
Final dimensional inspection waiver. (3D Scanco data utilized)
Conditional release (Casting may ship , but metallurgical data must be submitted in a reasonable time frame)
Casting has been accepted by EIO Quality with the above acceptions.

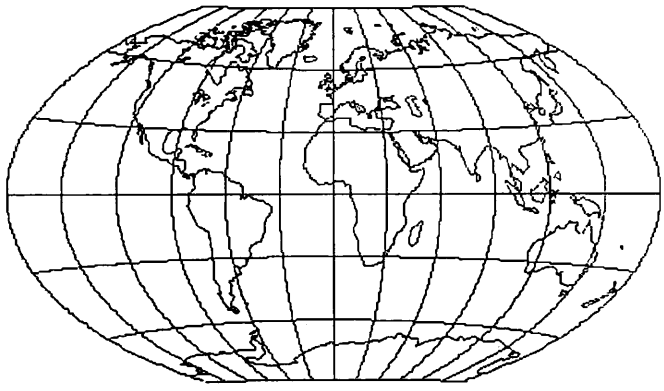
By signing below you acknowledge that the casting has met all applicable standards and contractual requirements

V. Supplier Quality Representative Sign Off

+ Charles Rwad	+ CRwad	3/30/05
Supplier Quality Representative (SQR) Print/Type Name	Supplier Quality Representative (SQR) Signature	Date

VI. Supplier Approval For Shipment

Procurement Agent Notified of Shipment	Date: 3/29/05	
Required Vendor Data Ready for Shipment	Date: 3/30/05	
Peter A Djordjevich	Peter A Djordjevich	3/30/05
Supplier's Representative Print/Type Name	Supplier's Signature	Date



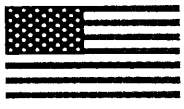
ENERGY INDUSTRIES OF OHIO

Purchase Order Number:
S005242-F

Part Number:
SE141-103-1

Part Name:
MCWF C-1

MTM Work Order Number:
65707/1.0
Data Package Revision: 1



MTM Major Tool & Machine, Inc.

Customer: 8909 - ENERGY INDUSTRIES OF OHIO
Customer P.O.: S005242-F
Customer Part ID: SE141-116 - MCWF C-1

Item#	Document Description / Material Description / File Name / Heat Lot
1	CERTIFICATE OF CONFORMANCE
2	COMPLETED SHOP TRAVELERS: - 65707-1 completed shop travelers.xls
3	NC17399: - 17399 dispositioned.pdf
4	NC17452: - 17452 dispositioned.pdf
5	NC17746: - 17746 dispositioned.pdf
6	NC18236: - 18236 dispositioned.pdf
7	NC18237: - 18237 dispositioned.pdf
8	NC18238: - 18238 dispositioned.pdf
9	NC18297: - 18297 dispositioned.pdf
10	NC18315: - 18315 dispositioned.pdf
11	NC18588: - 18588 dispositioned.pdf
12	NC18830: - 18830 dispositioned.pdf
13	NC18831: - 18831 dispositioned.pdf

DS141-036 - STUD

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
14	4	10	30	Material Certification: TEST REPORTS / DS141-036 - STUD - mc108260.tif / 8969595

DS141-060 - NUT

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
15	4	10	50	Material Certification: / DS141-060 - NUT - mc108258.tif / 8977349

DS141-079 - FLAT WASHER

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
16	4	10	60	Material Certification: / DS141-079 - FLAT WASHER - mc108259.tif / 8990135

SE141-078 - POLOIDAL BREAK SHIM ASSEMBLY

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
17	2	30	20	Certificate of Conformance: C OF C / LOCTITE 411 - LOCKING COMPOUND - mc106141.tif / CERTIFIED

SE141-078-03 - INSULATING SLEEVE

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
18	3	10	10	Certificate of Conformance: / G11CR_1 - ROUND, BAR, 1.75 DIA - mc108545.tif / CERTIFIED

SE141-103-1 - MOD COIL WINDING FORM ASSEMBLY TYPE-C

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
19	0	10	40	Material Certification: TRACE ID: 116255 / ER316MNNF_093_GTAW - WELD WIRE,GTAW .093 DIA - MC106579.TIF / W020132 / WO20132
20	0	10	40	Material Certification: TRACE ID: 113686 / ER316MNNF_093_GTAW - WELD WIRE,GTAW .093 DIA - MC106164.PDF / W020132 / WO20132

SE141-103-4 - INSULATING SHEET

Customer: 8909 - ENERGY INDUSTRIES OF OHIO
Customer P.O.: S005242-F
Customer Part ID: SE141-116 - MCWF C-1

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
21	7	10	10	Certificate of Conformance: G11CR / G11CR_3 - SHEET, FLAT - mc107081.tif / CERTIFIED

SE141-103-5 - INSULATING SLEEVE

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
22	5	10	10	Certificate of Conformance: / G11CR_1 - ROUND, BAR, 1.75 DIA - Same as Item #18 / CERTIFIED

SE141-116 - MODULAR COIL WINDING FORM TYPE-C

Item#	Sub	Op	Pc	Document Description / Material Description / File Name / Heat Lot
23	1	90		Inspection Data Checklist: 2 steps
24	1	100		Nondestructive Liquid Penetrant Test Certification #13726
25	1	120		Inspection Data Checklist: 137 steps
26	1	140		Inspection Data Checklist: 2 steps

Major Tool & Machine, Inc.

CERTIFICATE OF CONFORMANCE

Date: 12/05/05
User ID: GRIFFIT#

TO: ENERGY INDUSTRIES OF OHIO DATE: 10/25/2004

ATTENTION: Receiving Department

Seller certifies that:

Part Number: SE141-103-1 Purchase Order: S005242-F

Part Name: MCWF C-1 Workorder: 65707/1.0

Part Serial Number: C1 Quantity: 1

1. These materials and/or parts were produced in conformance with all contractually applicable Government and/or Customer specifications referred in, or furnished with, the above Purchase Order.
2. The materials and/or parts furnished under the above Purchase Order were produced:

   [X] From materials furnished by Customer for the production of such parts.

   [X] From materials for which the seller has available for examination chemical and/or physical test reports or other evidence of conformance to applicable specifications.
3. All processes required in the production of these part and/or materials are listed below and were performed by a facility or personnel approved or certified by the Seller and the customer when such approval or certification is required by contract.

Certifications are on file at this plant.

Other Requirements:

Signature: _____ Title: Quality Mgr Date: 10/25/05

Major
Tool & Machine, Inc.

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
Final Inspection----Prepare part for source inspection.----Review and complete QA data package per QAP and the requirements of the product specification NCSX-CSPEC-141-03.--Contact CFT to review data package prior to notifying source inspection.	65707/1.0 -Sub:0 Op#:20	Closed	9/29/2205	840-G.Masood
Source Inspection	65707/1.0 -Sub:0 Op#:30	Closed	9/29/2205	840-G.Masood
Package and Ship----Build a box/crate suitable for protecting the part from the environment.----Weigh the finished part and metal stamp the value in pounds on the casting in the area marked on the customer drawing.----Part must be protected and wrapped in plastic prior to inserting into the crate. Refer to PS583.----Part is to be shipped to PPPL in Princeton- NJ per QAP shipping address.----Crate must be marked/stenciled per the MTM drawing.	65707/1.0 -Sub:0 Op#:40	Closed	10/1/2005	131-W.Allen
Receive customer supplied material. --Verify the receipt of quality documentation for the casting.--Check off IDC noting receipt of material and receipt of quality documentation.----Part Number: SE141-116 Rev: 6--Part Description: PRODUCTION WINDING FORM TYPE-C	65707/1.0 -Sub:1 Op#:10	Closed	4/1/2005	825-B.Jarrett
Setup the machining fixture on the rotary table. Load casting into the machining fixture with the initial pickup pads facing up. Indicate the pickup pads and orient the casting for machining. ----Rough machine the top flange face and the outer periphery leaving .25- +.060/-.000-. The outside surfaces of the flange will serve as qualifiers for the next operation. Record the qualifier dimensions on the IDC.----Install the lifting holes per the MTM drawing.----Rough machine the top side of the -T- section leaving .25- +.060/-.000-.----Remove the casting from the machining fixture and flip over with the bottom flange facing up. Re-load into the machining fixture. Pickup the qualifiers and orient the casting for machining.----Rough machine the bottom flange face leaving .25- +.060/-.000-. ----Rough machine the poloidal break leaving a minimum of .25- of stock per side.----Install temporary shim filling in the poloidal break and hold together with temporary c-clamps. Tack weld in place.----Rough machine the bottom side of the -T- section leaving .25- +.060/-.000-.----Finish machine both sides of t	65707/1.0 -Sub:1 Op#:20	Closed	7/20/2005	219-T.Laird

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
Perform an in-process inspection of the magnetic permeability of the material using the Severn Permeability Indicator Gage. Inspect a minimum of (8) points on the rough machined flange face and an additional (8) points on the rough machined -T- section. Record the upper and lower range values on the IDC's. Values that exceed 1.02 must be documented with a non-conformance record and dispositioned prior to continuing.	65707/1.0 -Sub:1 Op#:40	Closed	8/26/2005	744-P.Schumacher
Finish machine the -T- section and wings. Run a probe pass to inspect the surface for stock.----Remove the casting from the machining fixture and flip over with the bottom flange facing up. Re-load the casting into the machining fixture. Pickup the qualifiers and orient the casting for machining.----Finish machine the -T- section and wings. Run a probe pass to inspect the surface for stock.----Obtain sketches SE141-116 FLATNESS D and SE141-116 FLATNESS E from the team leader. Use this sketch as a map and record indicator readings at each tooling ball location and near each point. Record information on the IDC prior to moving the part to the next workcenter.	65707/1.0 -Sub:1 Op#:70	Closed	9/21/2005	274-M.Moorman
Setup the machining fixture with the casting installed. Machine the inspection fiducials per the MTM drawing. Finish machine the poloidal break to drawing requirements. Remove the casting from the machining fixture.----Install temporary shims in the poloidal break. Use the temporary shim 1.75 thick with additional shims as necessary and C-clamp before moving the part.	65707/1.0 -Sub:1 Op#:80	Closed	9/21/2005	274-M.Moorman
DEBURR ENTIRE PART- NO SHARP EDGES ALLOWED. HAND WORK THE TWO SIDE -L-'S OF THE .750 WIDE TWISTED SHAPE OR -T- SECTION TO YIELD A SURFACE FINISH OF 125 RMS OR BETTER. SEE ENGINEERING TO CLARIFY SURFACES NEEDING HANDWORK. INSPECT SURFACE FINISH AND RECORD ON IDC. SPRAY UP WITH BLUE AND HANDWORK UNTIL BLUE IS TOTALLY REMOVED. SURFACE PROFILE TOLERANCE IS CRITICAL SO ONLY REMOVE THE STOCK NECESSARY TO PRODUCE THE REQUIRED SURFACE FINISH.--ALL GRINDING WHEELS AND DISKS MUST BE VIRGIN MATERIAL NOT PREVIOUSLY USED ON ANY MATERIAL TO AVOID MATERIAL CONTAMINATION.	65707/1.0 -Sub:1 Op#:85	Closed	9/30/2005	219-T.Laird

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
Inspect the magnetic permeability of the entire casting using the Severn Permeability Indicator Gage. Refer to PS584. All as cast surfaces must be inspected on a 6- x 6- grid. Record range of actual values on IDC. All machined surfaces must be inspected on a 2- x 2- grid. Record range of actual values on IDC. Permeability measurements shall be per supplementary requirements S24 of ASTM A703/A703M and S1 of ASTM A800/800M except the results will be expressed as relative permeability (μ) rather than ferrite content (FN). Values that exceed 1.02 must be documented with a non-conformance record and dispositioned prior to continuing.	65707/1.0 -Sub:1 Op#:90	Closed	9/20/2005	212-J.Lehr
SOURCE FOR MAG PERMEABILITY----CONTACT ENGINEERING. DO NOT HOLD FOR CUSTOMER IF THEY ARE NOT PRESENT.	65707/1.0 -Sub:1 Op#:91	Closed	9/21/2005	840-G.Masood
PT 100% of the part as-cast surfaces as well as finished machine surfaces. See PS582 for processing instructions. During the inspection also perform a visual inspection of the casting surface per ASTM A802/A802M and accept per the same. Include reference to ASTM A802 on the certification.----Specification: ASTM A903/A903M----Method: ASTM E165----Acceptance Criteria: ASTM A903/A903M Level II for as cast surfaces----Acceptance Criteria: ASTM A903/A903M Level I for machined surfaces including the entire -T- section (high stress areas)----Certification: MTM certification to include the information per Supplementary Requirements S1 of ASTM A903/A903M--MTM NDT Cert: LPI CERTIFICATION	65707/1.0 -Sub:1 Op#:100	Closed	9/21/2005	840-G.Masood
SOURCE FOR PT----CONTACT ENGINEERING. DO NOT HOLD FOR CUSTOMER IF THEY ARE NOT PRESENT.	65707/1.0 -Sub:1 Op#:101	Closed	9/29/2005	840-G.Masood
Setup and inspect the part 100% per the drawing requirements. Refer to PS593.--Surface profile dimensions are to be taken on a 2- x 2- grid for machined surfaces and 4- x 4- grid for as cast surfaces.--Inspect fiducials that are located around the periphery of both flanges. --Record dimensions as required per the IDC's.--Forward and IGES file of the 2 x 2 and 4 x 4 grid points as well as points representing the locations of the inspection fiducials to Kevin Bowling for reporting to the customer.	65707/1.0 -Sub:1 Op#:120	Closed	9/29/2005	295-C.Weaver
SOURCE FOR DIMENSIONAL	65707/1.0 -Sub:1 Op#:121	Closed	9/29/2005	840-G.Masood

Major Tool & Machine, Inc.

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
Clean the casting thoroughly to remove all coolant- oil- tapping fluid etc... Rinse the part thoroughly and wipe down with isopropyl alcohol to remove any residue or film. Refer to PS583.----Install the poloidal break shim assembly and accompanying hardware and insulation per the assembly drawing.----Stamp numbers near every fifth -T- hole per sketch. See engineering for sketch.	65707/1.0 -Sub:1 Op#:130	Closed	9/30/2005	219-T.Laird
Perform electrical resistance test.----Wire all of the bolts together. Set one jumper directly on casting flange and one on the bolts. Record resistance between the bolt and casting combination and the mid-plane shim in kohms on IDC.----Set a jumper between the poloidal joint midplane and the casting. Set one jumper on the poloidal joint midplane and one on each of the bolts. Record range of resistance in kohms on IDC.	65707/1.0 -Sub:1 Op#:140	Closed	9/29/2005	840-G.Masood
SOURCE FOR ELECTRICAL TEST	65707/1.0 -Sub:1 Op#:150	Closed	9/29/2005	840-G.Masood
WELD BUILD UP AREA PER NC17399.	65707/1.0 -Sub:8 Op#:10	Closed	5/31/2005	099-J.Velez
WELD BUILD UP AREA PER NC 17452	65707/1.0 -Sub:9 Op#:10	Closed	6/6/2005	465-J.Bever
RECEIVE CUSTOMER SUPPLIED CASTING	65707/1.0 -Sub:2 Op#:10	Closed	9/2/2005	883-S.Dulworth
MACHINE THE SHIM COMPLETE PER THE DRAWING AND CNC PROGRAMS.	65707/1.0 -Sub:2 Op#:20	Closed	9/8/2005	506-R.Liston
ASSEMBLE (5) OF THE INSULATING SLEEVES INTO THE SHIM AND BOND USING LOCTITE 411. DO NOT INSTALL THE BUSHINGS IN THE OUTSIDE HOLES. THEY WILL BE INSTALLED LATER.	65707/1.0 -Sub:2 Op#:30	Closed	9/12/2005	746-G.Davidson
SAW OFF 16- AND MOVE TO NEXT WORK CENTER.	65707/1.0 -Sub:3 Op#:10	Closed	6/1/2005	227-D.Bockover
MACHINE PER THE DRAWING FOR A SLIP FIT WITH MATING DETAIL. OBTAIN FINISHED MACHINED CASTING SHIM BEFORE FINAL SIZING THE O.D. OF THE SLEEVE.	65707/1.0 -Sub:3 Op#:20	Closed	7/18/2005	821-J.Leggins
RECEIVE MATERIAL--NOTIFY CFT AND FORWARD MATERIAL STORES.	65707/1.0 -Sub:4 Op#:10	Closed	5/19/2005	825-B.Jarrett
SAW OFF 30- LENGTH AND MOVE TO NEXT WORK CENTER.	65707/1.0 -Sub:5 Op#:10	Closed	6/1/2005	227-D.Bockover
MACHINE PER THE DRAWING FOR A SLIP FIT WITH MATING DETAIL. CHECK FINISHED MACHINED CASTING BEFORE FINAL SIZING THE O.D. OF THE SLEEVE.	65707/1.0 -Sub:5 Op#:20	Closed	9/21/2005	565-S.Woods
SAW 13- LENGTH AND MOVE TO NEXT WORK CENTER.	65707/1.0 -Sub:6 Op#:10	Closed	6/1/2005	227-D.Bockover

Activity	Visual Mfg Ref.	Op Status	Close Date	Emp ID
UNRELEASED DO NOT PERFORM THIS OPERATION DUE TO PRODUCT CHANGES THIS PART HAS BEEN ELIMINATED FROM THE ASSEMBLY.	65707/1.0 -Sub:6 Op#:20	Closed		276-B.Probst
RECEIVE MATERIAL	65707/1.0 -Sub:7 Op#:10	Closed	4/5/2005	131-W.Allen
MACHINE THE PROFILE LEAVING STOCK PER PROGRAM.----ALSO MACHINE OUT FLAT STOCK PIECES FOR SHIMS BEHIND THE OUTSIDE OF POLOIDAL BREAK FLANGE PER CNC PROGRAM.	65707/1.0 -Sub:7 Op#:20	Closed	9/2/2005	568-J.Kereszturi
OPEN UP THE OUTSIDE (2) HOLES ON BOTH SIDE PLASTIC SHIM PIECES TO 1.670- TO ALLOW FOR BUSHING ASSEMBLY. SEE ENGINEERING OR CHAD EASTMAN FOR SPECIFIC INSTRUCTIONS.	65707/1.0 -Sub:7 Op#:30	Closed	9/21/2005	361-M.Westerfield
HANDWORK AREAS AS DESCRIBED BY CUSTOMER DISPOSITION OF NC 18237. SEE ATTACHMENT SECTION OF NC FOR CUSTOMER DISPOSITION AND ASSOCIATED MAPS. DO NOT REMOVE MARKING WHILE REWORKING THESE AREAS. THE MARKING WILL REMAIN ON PART FOR REVIEW BY CUSTOMER AFTER SHIPMENT. DO NOT USE ANY FLUIDS OTHER THAN ISOPROPYL ALCOHOL ON THE G11 (PLASTIC) MATERIAL THAT IS LOCATED AT THE POLOIDAL BREAK (SPLIT LINE).	65707/1.0 -Sub:10 Op#:10	Closed	9/29/2005	164-L.Freeland

Major Tool &
Machine, Inc.
1458 East 19th Street
Indianapolis, IN
46218-4289

MTM N/C: 17399

Date: 05/24/05

User ID: BOWLINK

ENERGY INDUSTRIES OF OHIO Customer:
Contact: NANCY HORTON Telephone: 216-496-2314
NKHFlowen@aol.com E-Mail: 216-328-2001 Fax:

SE141-116 / MODULAR COIL WINDING FORM TYPE Part:
S005242-F/Ln:1 Customer P.O.: SE141-116 Drawing ID: 3 Revision: C1 Serial No./Qty: Links: 1-Type:W: 65707/1.0 Sub: 1 Op: 20

KEVIN BOWLING Reported By: 317-636-6433 Telephone: E-Mail: kBowling@MajorTool.com Fax: 317-634-9420

Problem: Part was gouged by an errant tool path.
Gouge is approximately 2" wide by 10" long and at worst case 1/2" deep.

Proposed Disposition:
SUBMIT TO CUSTOMER REQUESTING WELD REPAIR.

Number of additional pages:

Customer Disposition: [ ] Use As Is [ ] Rework X Repair [ ] Scrap [ ] Replace

MTM is authorized to ~~proceed with~~ repair Piston Pkt. 5 on Casting C-1 based on the ~~as soon as MTM's weld repair procedure which was submitted by e-mail on 5/12/05 is formally approved by PPPL. Weld repair procedures are currently being reviewed at~~ PPPL.
Submitted weld qualification procedures which lack some of the test results required in ASTM A488. Full qualification and re-submittal are required ~~before~~ ASAP and prior to weld repair on any subsequent castings. B.N. Concurs

Technical Contact Approval: Phil Heitzenroeder 2005.05.25 08:10:42 -04'00' PPPL Tech. Rep. FA 5/26/05 ~~5/24/05~~ 5/26/05

Buyer Approval: Larry J Sutton Title: SR BUYER Date: 5/26/05

Major Tool Implemented By: Kevin Bowling Title: PROGRAM MANAGER Date: 27-MAY-2005

816-PROGRAMMING ERROR Root Cause 1:

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 17452

Page: 1
Date: 06/03/05
User ID: BOWLINK

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON — Telephone: 216-496-2314
E-Mail: NKHFlowen@aol.com — Fax: 216-328-2001

Part: SE141-116 / MODULAR COIL WINDING FORM TYPE — Customer P.O.: S005242-F/Ln:1
Drawing ID: SE141-116 — Revision: 3 — Serial No./Qty: 1
Links: 1-Type:W: 65707/1.0 Sub: 1 Op: 20

Reported By: KEVIN BOWLING — Telephone: 317-636-6433
E-Mail: kBowling@MajorTool.com — Fax: 317-634-9420

Problem: THERE IS A TOOL GOUGE ON A CORNER OF THE FLANGE FACE.

Proposed Disposition:
SUBMITTED TO CUSTOMER REQUESTING PERMISSION TO WELD REPAIR.

Number of additional pages:_____

Customer Disposition: [ ] Use As Is [ ] Rework X] Repair [ ] Scrap [ ] Replace

MTM is authorized to weld repair the gouge. Welding may proceed per N/C 17339, which authorizes repairs on the C1 casting based on the submitted weld qualification procedures which lack some of the test results required in ASTM A488.

Technical Contact Approval: Phil Heitzenroeder 2005.06.03 11:39:21 -04'00' **Title:**_____ **Date:**_____

RLM Approval: Brad Nelson **Title:**_____ **Date:**_____

Major Tool Implemented By: Kevin Bowling **Title:** PROGRAM MGMT **Date:** 10-NOV-05

Root Cause 1: 806-PROCEDURE NONCOMPLIANCE
Resource: 40FT MITSU — Equipment:
Description: MACHINIST TOUCHED OFF THE PART AND SET ZERO INCORRECTLY.

Corr Actn: 1: — Action: — By:
Description: N/A

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 17746

Date: 08/19/05
User ID: BOWLING

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON — Telephone: 216-496-2314
E-Mail: NKHFlowen@aol.com — Fax: 216-328-2001

Part: SE141-116 / MODULAR COIL WINDING FORM TYPE — Customer P.O.: S005242-F/Ln:1
Drawing ID: SE141-116 — Revision: 5 — Serial No./Qty: C-1

Reported By: KEVIN BOWLING — Telephone: 317-636-6433
E-Mail: kBowling@MajorTool.com — Fax: 317-634-9420

Problem: Part has multiple gouges from tools and one dent. See attached sketches describing the non-conformances.

Proposed Disposition:
SUBMIT TO CUSTOMER FOR DISPOSITION.

Number of additional pages: 1

Customer Disposition: **Use As Is** [X **Rework** [ ] **Repair** [ ] **Scrap** [ ] **Replace**

NCSX reviewed the descriptions of the three tool gouges and one dent shown in the attached sketches. The gouges need to be blended to avoid sharp edges. The dent defect needs to be worked as necessary so the tapped hole can be used.

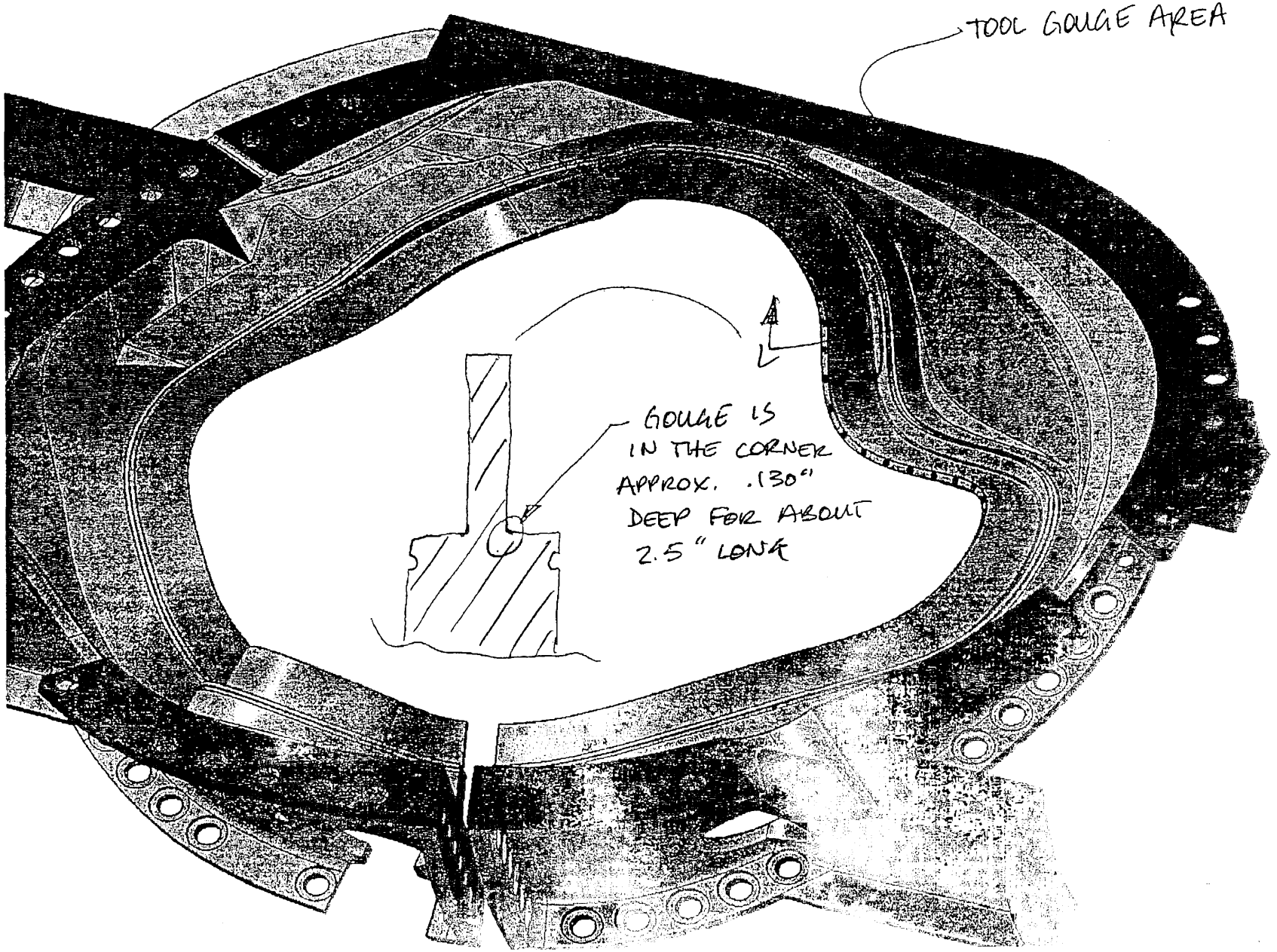
Technical Representative: Phil Heitzenroeder 2005.08.25 16:13:48 -04'00'

RLM: Brad Nelson Digitally signed by Brad Nelson DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov Date: 2005.08.25 17:22:21 -04'00'

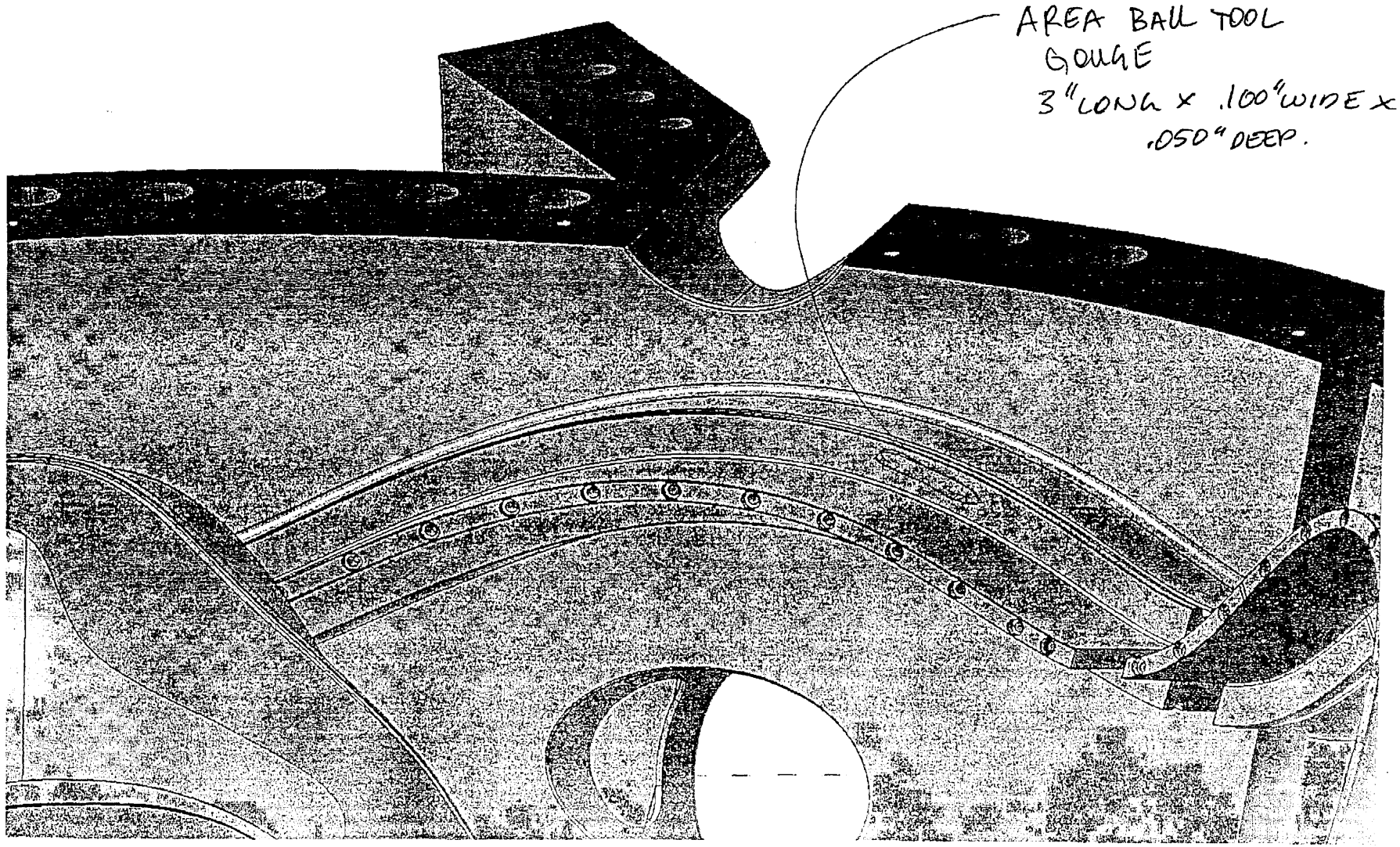
Major Tool Implemented By: _____ **Title:** QA ENGINEER **Date:** 1/16/2006

n:\mmapps\Mtnonc14.qrp

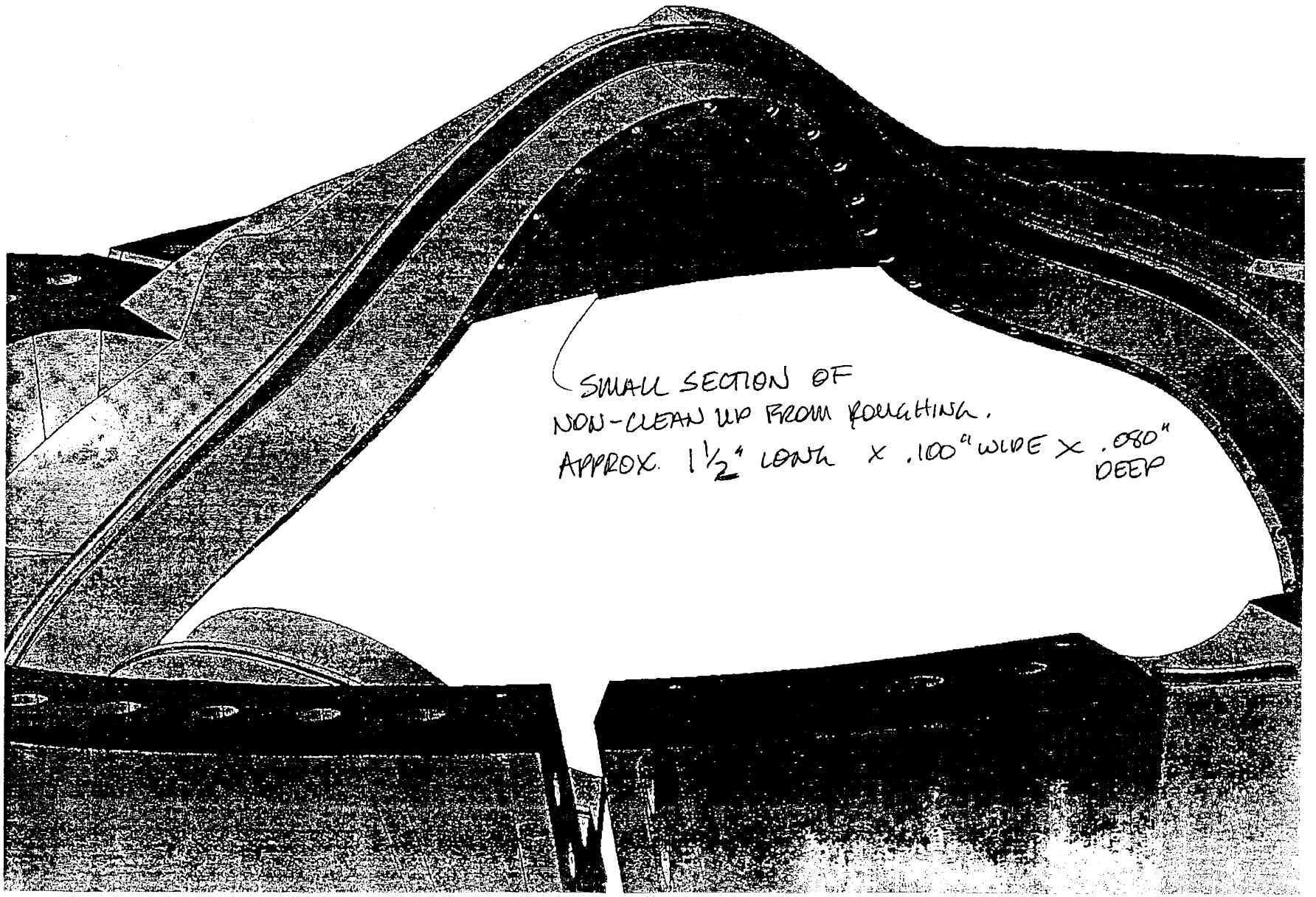
(1.)


TOOL GOUGE AREA
GOUGE IS IN THE CORNER APPROX. .130" DEEP FOR ABOUT 2.5" LONG

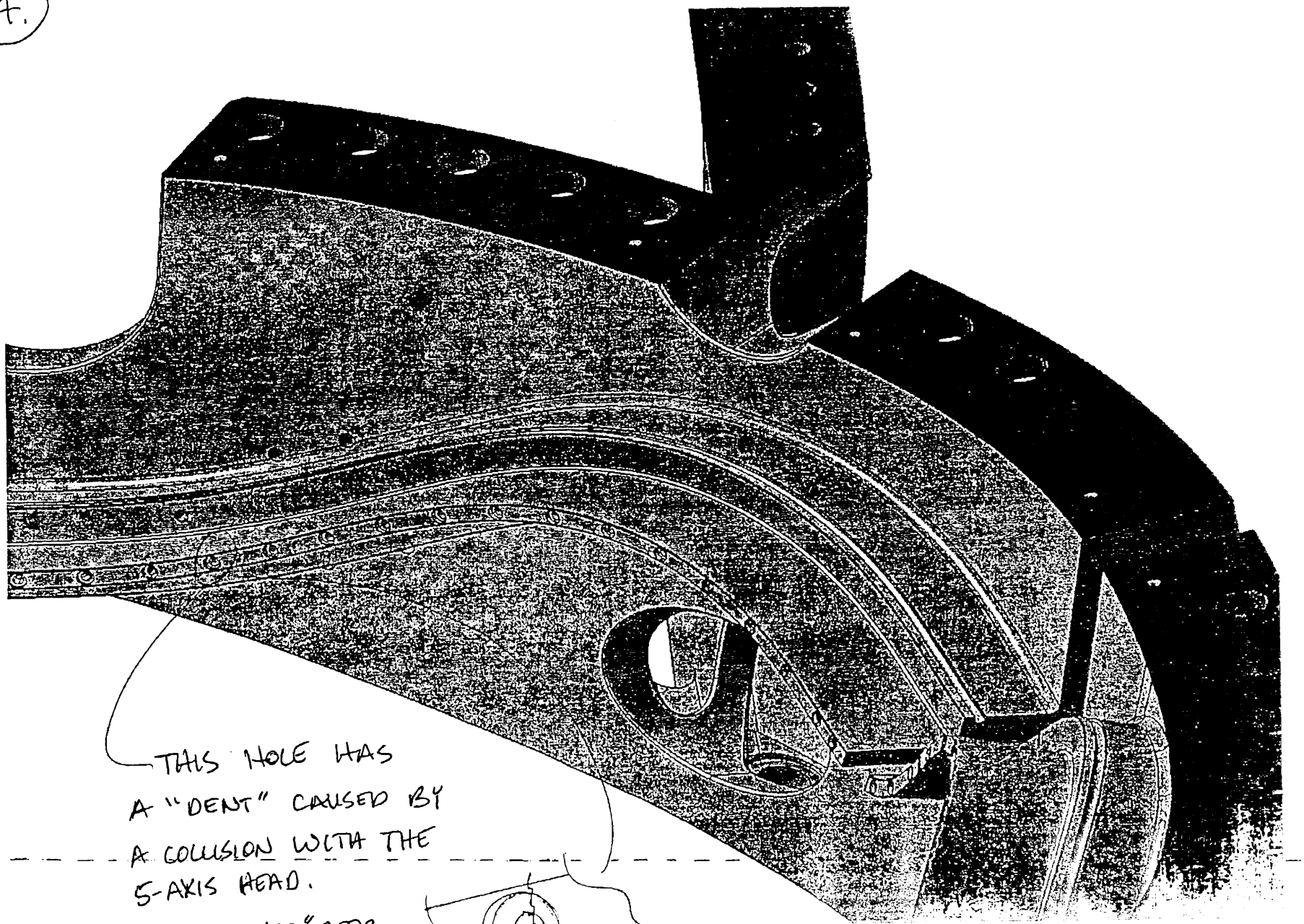
(2.)



(3.)


SMALL SECTION OF
NON-CLEAN UP FROM ROUGHING.
APPROX. 1½" LONG X .100" WIDE X .080" DEEP

4.



THIS HOLE HAS
A "DENT" CAUSED BY
A COLLISION WITH THE
5-AXIS HEAD.
APPROX .100" DEEP

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 18236

Page: 1
Date: 09/21/05
User ID: BOWLINK

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON — Telephone: 216-496-2314
E-Mail: NKHFlowen@aol.com — Fax: 216-328-2001

Part: SE141-116 / MODULAR COIL WINDING FORM TYPE — Customer P.O.: S005242-F/Ln:1
Drawing ID: SE141-116 — Revision: 6 — Serial No./Qty: C1

Reported By: KEVIN BOWLING — Telephone: 317-636-6433
E-Mail: kBowling@MajorTool.com — Fax: 317-634-9420

Problem: AFTER MACHINING SEVERAL MACHINING DEFECTS WERE DETECTED UPON VISUAL EXAMINATION. SEE ADDITIONAL DOCUMENTS FOR MAPS AND LISTS OF (16) SEPARATE NON-CONFORMING FEATURES.

Proposed Disposition:
SUBMIT TO CUSTOMER CONTINUE PROCESSING THE PART.

Customer Disposition: [X] Use As Is [ ] Rework [ ] Repair [ ] Scrap [ ] Replace

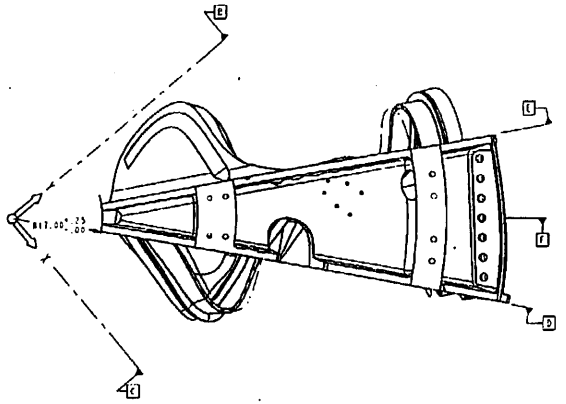
PARL WILL PATCH IMPERFECTIONS WITH FILLED EPOXY MIXTURE

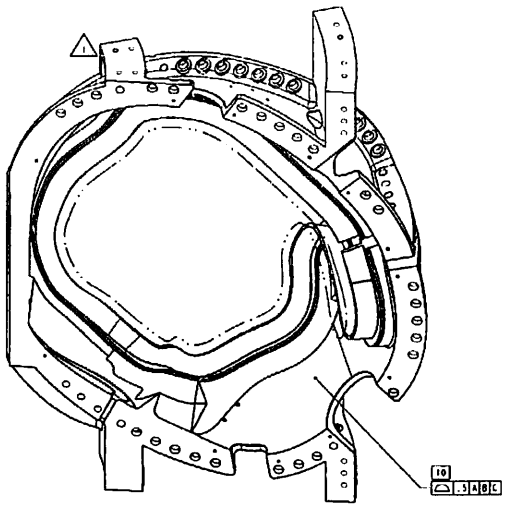
Technical Contact Approval: _____ Title: Tech Rep. Date: 9/22/05

RLM ~~Buyer~~ Approval: _____ Title: RLM Date: 9/22/05

Major Tool Implemented By: _____ Title: PROG. MGR Date: 23-SEP-05

n:\mtmapps\Minor14.qrp

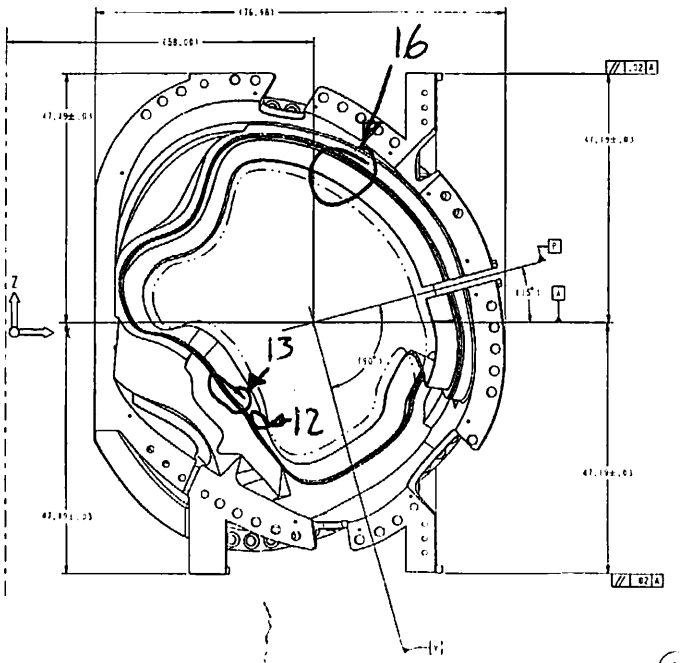


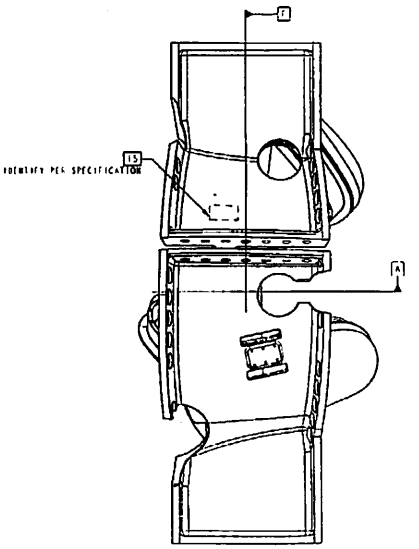


ISOMETRIC VIEW

NOTES:

1. DRAWING PREPARED IN ACCORDANCE WITH ASME Y14.2M-1994.
2. INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M-1994.
3. DIMENSIONS ARE IN INCHES.
4. DRAWING DEFINES FINAL MACHINED STATE OF PART DEFINED BY PRO/ENGINEER FILE SE141-116.PRT.
5. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE RELATED TO
   DATUM A- (PRIMARY X-Y PLANE, TOP)
   DATUM B- (SECONDARY Y-Z PLANE, SIDE)
   DATUM C- (TERTIARY X-Z PLANE, FRONT)
6. DIMENSIONS APPLY AT TEMPERATURE OF 20-30°C (68-86°F)
7. DIMENSIONS AND TOLERANCES EXCLUDE PROCESS MATERIAL ALLOWANCES WHICH MAY ADD MASS.
8. APPROXIMATE WEIGHT = 4656 LBS.
   WEIGHT OF FINISHED PART NOT TO EXCEED 6000 LBS.
9. UNLESS OTHERWISE SPECIFIED, AS-CAST SURFACE PROFILE TOLERANCE = +/-.25 - INCH, WITH EXEMPTION FOR INTERSECTING SURFACES WHERE FILLETS ARE EXPECTED. MIN FILLET AND CORNER RADII = 0.5 +/- 0.1-IN.
10. DESIGNATED SURFACE REGIONS HAVE PROFILE TOLERANCE = +/-0.125-IN.
11. MIN THICKNESS PER CAD GEOMETRY, TOLERANCE = +0.25-IN / -0.0-IN.
12. PARTING LINE EDGES, FLASH, GATES, RUNNER, AND RISER EXTENSIONS 0.25-IN MAX
13. UNLESS OTHERWISE SPECIFIED, MACHINED SURFACE PROFILE TOLERANCE = +/- 0.01-IN
14. BACK SPOTFACE ALL THRU HOLES MINIMUM TO CLEAN UP.
15. SEE LATEST REVISION OF SPECIFICATION NCSX-CSPEC-141-03 FOR ADDITIONAL REQUIREMENTS.





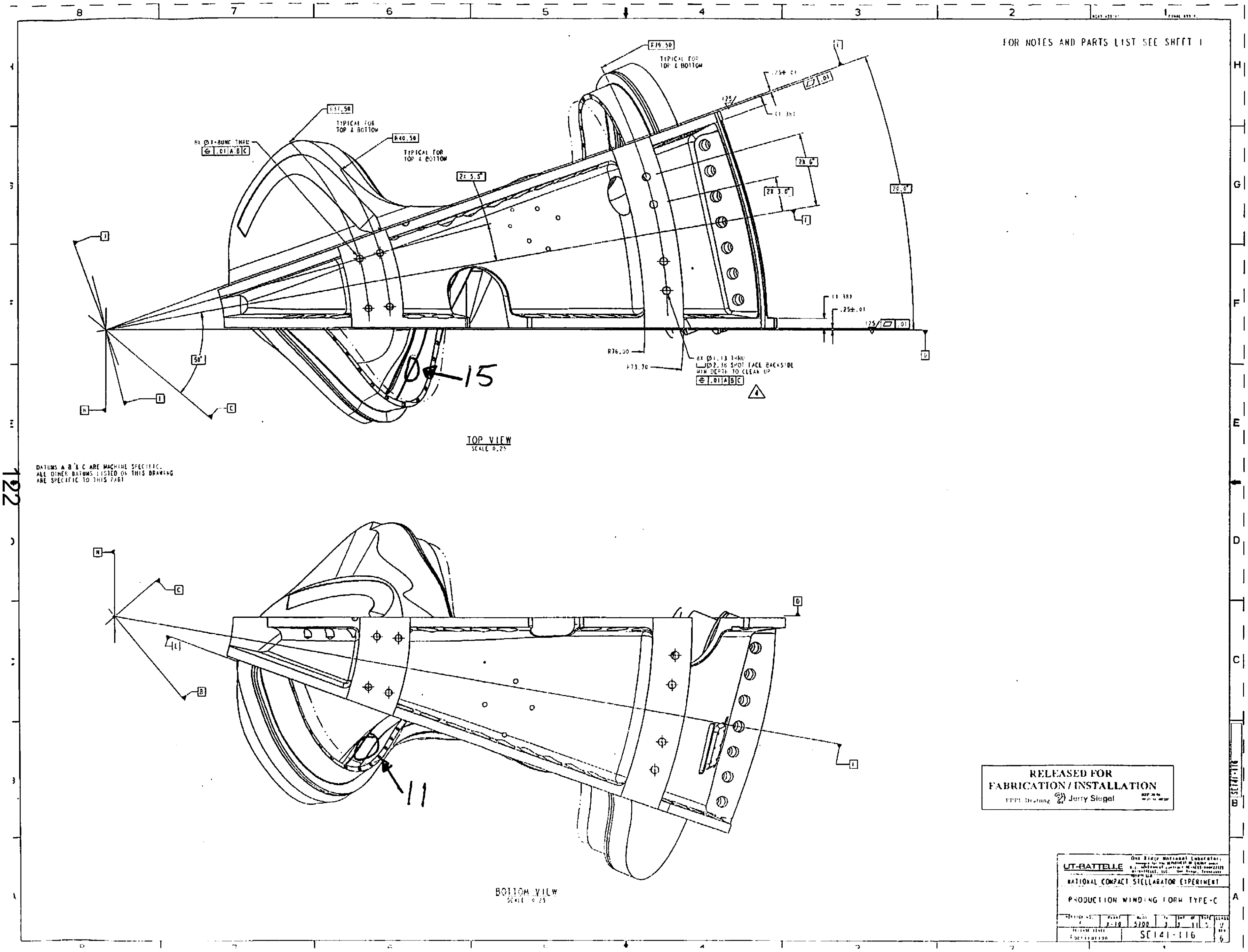
RELEASED FOR FABRICATION / INSTALLATION
PPPL Drafting: Jerry Siegel

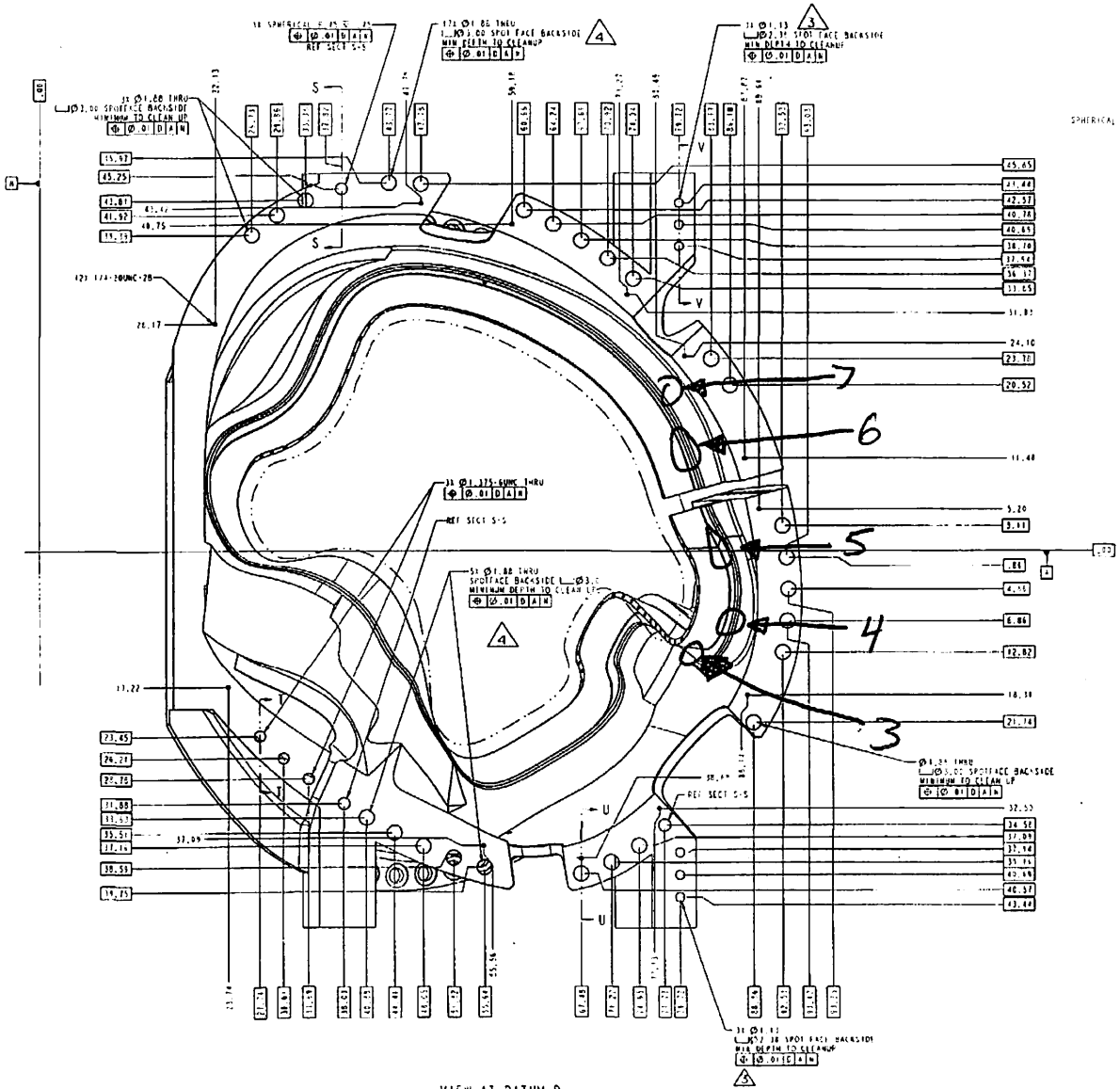
QTY	CAGE CODE	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL	SPECIFICATION	FIND NO
		NEXT ASSEMBLY				

PARTS LIST

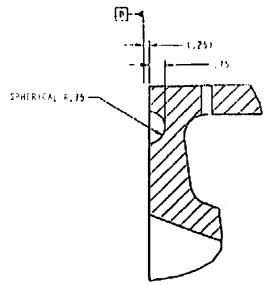
P THIS DRAWING PRODUCED ON PRO/ENGINEER

UT-BATTELLE
NATIONAL COMPACT STELLARATOR EXPERIMENT
PRODUCTION WINDING FORM TYPE C
SE141-116 6

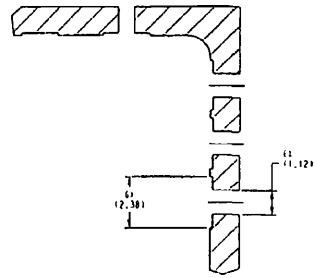

FOR NOTES AND PARTS LIST SEE SHEET 1
TYPICAL FOR TOP & BOTTOM
R40.50
R79.50
R76.00
R73.70
2X 5.5°
2X 6°
2X 3.0°
70.0°
50°
.25±.01
DATUMS A, B & C ARE MACHINE SPECIFIC. ALL OTHER DATUMS LISTED ON THIS DRAWING ARE SPECIFIC TO THIS PART
TOP VIEW
SCALE 0.25
15
11
BOTTOM VIEW
SCALE 0.25
RELEASED FOR FABRICATION / INSTALLATION
Jerry Siegel
UT-BATTELLE
NATIONAL COMPACT STELLARATOR EXPERIMENT
PRODUCTION WINDING FORM TYPE-C
SE141-116



VIEW AT DATUM D
SCALE 0.25



SECTION S-S
SCALE 0.50



SECTION V-V
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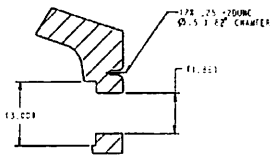

SECTION U-U
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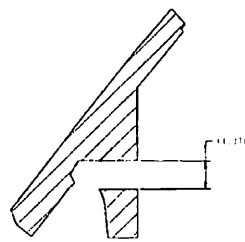


SECTION T-T
SCALE 0.50

FOR NOTES AND PARTS LIST SEE SHEET 1

RELEASED FOR
FABRICATION / INSTALLATION
PPPL Drafting Jerry Siegel

UT BATTELLE
Oak Ridge National Laboratory

NATIONAL COMPACT STELLARATOR EXPERIMENT

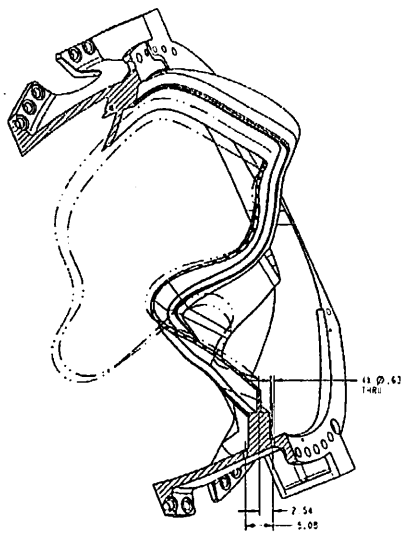
PRODUCTION WINDING FORM TYPE-C

SCALE 0.25 | SIZE D | SHEET 1 OF 6 | REV U

SE141-116

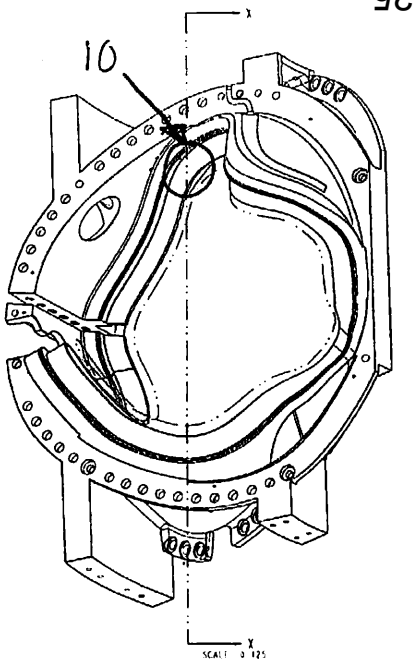
123

FOR NOTES AND PARTS LIST SEE SHEET 1



SECTION X-X

USE PROVE MODEL GEOMETRY TO DETERMINE SECTION ORIENTATION



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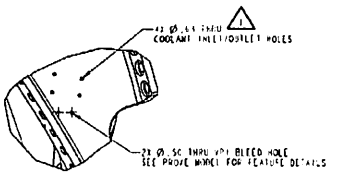
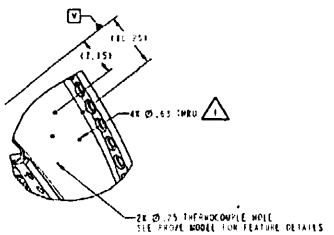
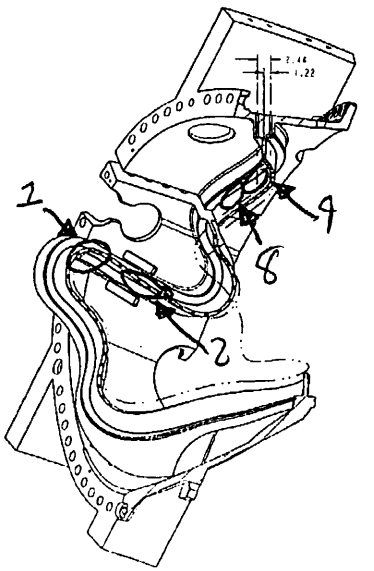
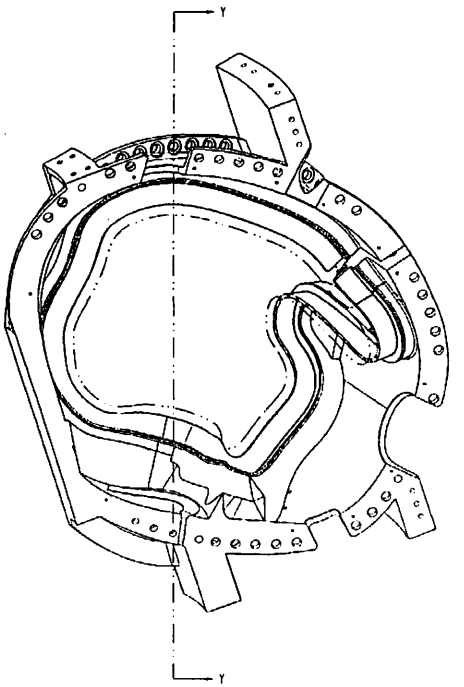




COOLING INLET / OUTLET HOLES.

TYPICAL 2 PLACES





SECTION Y-Y

SCALE 0.125

USE PROVE MODEL GEOMETRY TO DETERMINE SECTION ORIENTATION

RELEASED FOR FABRICATION/INSTALLATION

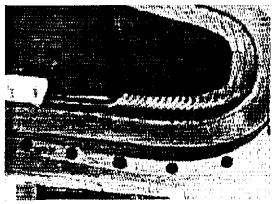
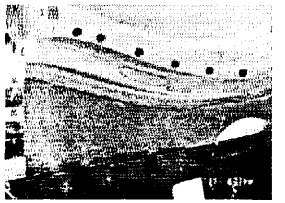
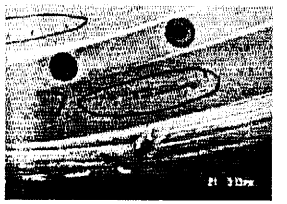
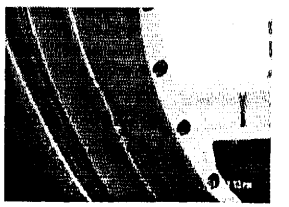
APPROVED: Jerry Siegel

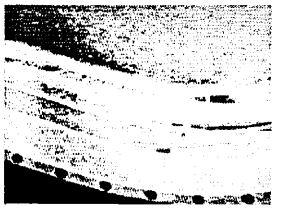
UT-BATTELLE — Oak Ridge National Laboratory

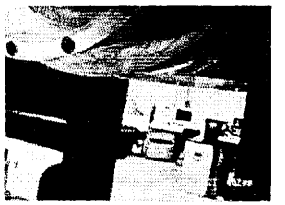
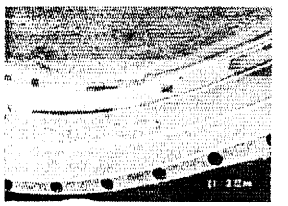
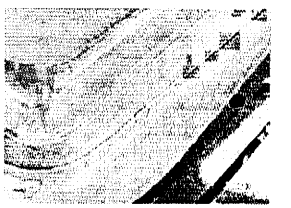
NATIONAL COMPACT STELLARATOR EXPERIMENT

PRODUCTION WINDING FORM TYPE-C

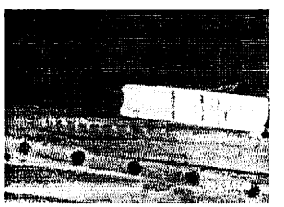
SE141-116

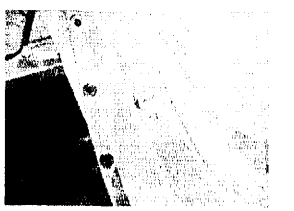














C1 MCWF

Photos for NC18236

K. Bowling 21-Sep-05

Major Tool & Machine, Inc.

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 18237

Page: 1
Date: 09/21/05
User ID: BOWLINK

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON — Telephone: 216-496-2314
E-Mail: NKHFlowen@aol.com — Fax: 216-328-2001

Part: SE141-116 / MODULAR COIL WINDING FORM TYPE — Customer P.O.: S005242-F/Ln:1
Drawing ID: SE141-116 — Revision: 6 — Serial No./Qty: C1

Reported By: KEVIN BOWLING — Telephone: 317-636-6433
E-Mail: kBowling@MajorTool.com — Fax: 317-634-9420

Problem: AFTER MACHINING SEVERAL MACHINING DEFECTS ON THE OUTSIDE OF THE PART WERE DETECTED UPON VISUAL EXAMINATION. SEE ADDITIONAL DOCUMENTS FOR MAPS AND LISTS OF (9) SEPARATE NON-CONFORMING FEATURES.

Proposed Disposition:
SUBMIT TO CUSTOMER CONTINUE MANUFACTURING.

Customer Disposition: [ ] Use As Is [X] Rework [ ] Repair [ ] Scrap [ ] Replace

ITEM 3 - BLEND TROUGH SMOOTHLY

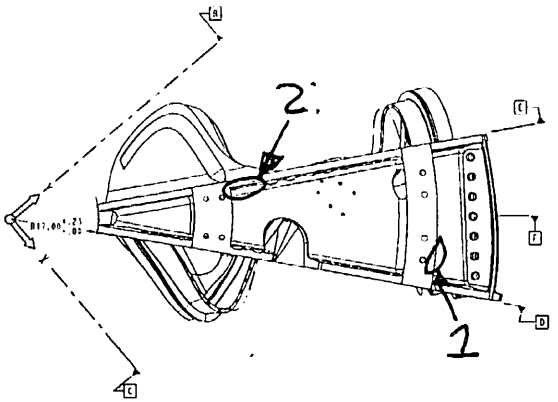
ITEMS 1, 2, 4, 5, 6, 7, 8, 9 - REMOVE SHARP EDGES, GRIND FLUSH

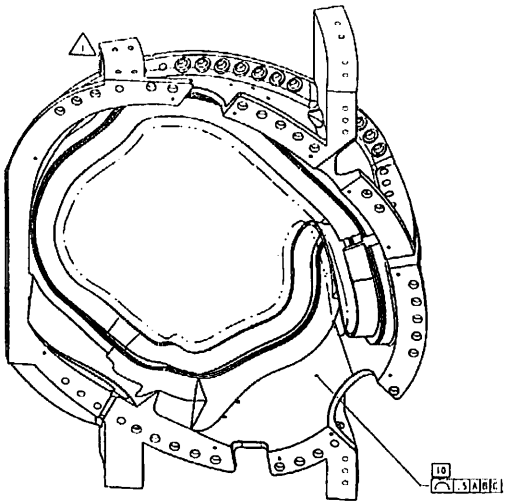
Technical Contact Approval: Phil Heitzman — Title: Tech. Rep — Date: 9/22/05

RLM ~~Buyer~~ Approval: [signature] — Title: RLM — Date: 9/22/05

Major Tool Implemented By: K. Bowling — Title: PROG. MGR. — Date: 26-SEP-05

n:\mmapps\Minoac14.qrp

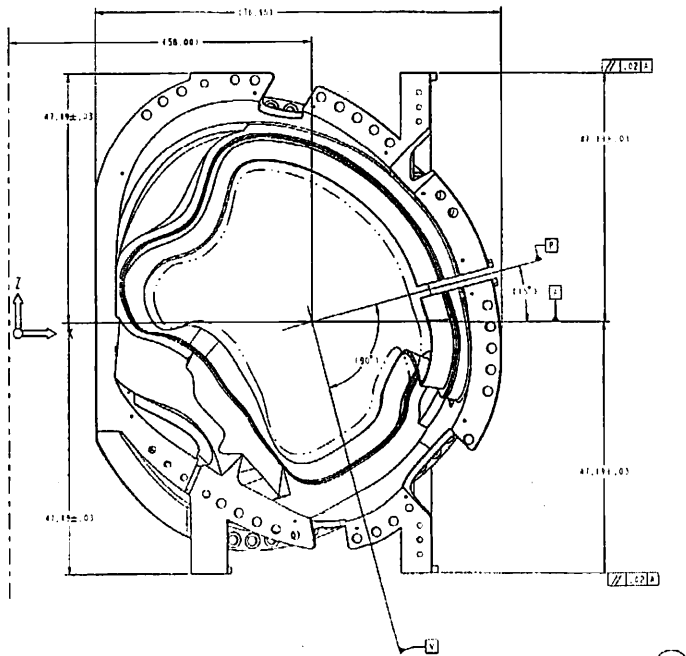


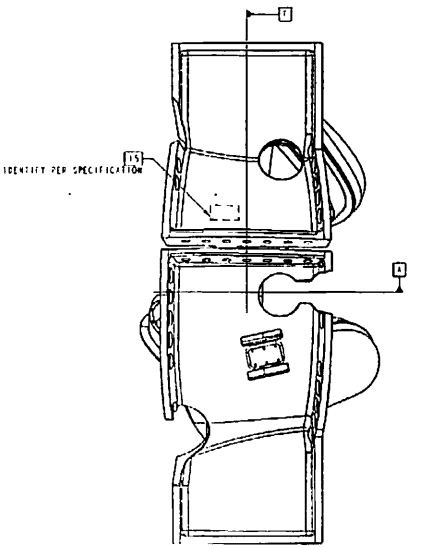


ISOMETRIC VIEW

NOTES:

1. DRAWING PREPARED IN ACCORDANCE WITH ASME Y14.24M 1994.
2. INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M 1994.
3. DIMENSIONS ARE IN INCHES.
4. DRAWING DEPICTS FINAL MACHINED STATE OF PART DEFINED BY PRO/ENGINEER FILE SE141-116.PRT.
5. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE RELATED TO
   DATUM A= (PRIMARY X-Y PLANE, TOP)
   DATUM B= (SECONDARY Y-Z PLANE, SIDE)
   DATUM C= (TERTIARY X-Z PLANE, FRONT)
6. DIMENSIONS APPLY AT TEMPERATURE OF 23±3°C (68°±5°F).
7. DIMENSIONS AND TOLERANCES EXCLUDE PROCESS MATERIAL ALLOWANCES WHICH MAY ADD MASS.
8. APPROXIMATE WEIGHT = 4856 LBS. WEIGHT OF FINISHED PART NOT TO EXCEED 6000 LBS.
9. UNLESS OTHERWISE SPECIFIED, AS-CAST SURFACE PROFILE TOLERANCE = +/-.25 - INCH, WITH EXEMPTION FOR INTERSECTING SURFACES WHERE FILLETS ARE EXPECTED. MIN FILLET AND CORNER RADII = 0.5 +/- 0.1-IN.
10. DESIGNATED SURFACE REGIONS HAVE PROFILE TOLERANCE = +/-0.125-IN.
11. MIN THICKNESS PER CAD GEOMETRY, TOLERANCE = +0.25 IN / -0.0-IN.
12. PARTING LINE EDGES, FLASH, GATES, RUNNER, AND RISER EXTENSIONS 0.25-IN MAX
13. UNLESS OTHERWISE SPECIFIED, MACHINED SURFACE PROFILE TOLERANCE = +/- 0.01-IN.
14. BACK SPOTFACE ALL THRU HOLES MINIMUM TO CLEAN UP.
15. SEE LATEST REVISION OF SPECIFICATION NCSX-CSPEC-141-02 FOR ADDITIONAL REQUIREMENTS.





RELEASED FOR FABRICATION / INSTALLATION
PPPL Drafting Jerry Siegel

QTY	SE141-116	WINDING FORM TYPE-C	CAST	SEE NOTE 8&9	ITEM NO.
	CAGE CODE / PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL	SPECIFICATION	
	NEXT ASSEMBLY	PARTS LIST			

(1) SCALE .125

SCALE NOTED	DES J. BROWN		UT-BATTELLE	Oak Ridge National Laboratory	
UNLESS OTHERWISE SPECIFIED	DRN P. MILLER				
	CHK W. COLE		NATIONAL COMPACT STELLARATOR EXPERIMENT		
FRACTIONS	APPV				
DECIMALS .X ±	M. WILLIAMSON		PRODUCTION WINDING FORM TYPE-C		
DECIMALS .XX ±					
ANGLES ±					
BREAK SHARP EDGES AS REQ	MFG APPV J. SIEGEL		SIZE A	FSCM NO. 12	SE141-116
FINISH			SCALE 1:2	WEIGHT 5700	SHEET 1 OF 1

P

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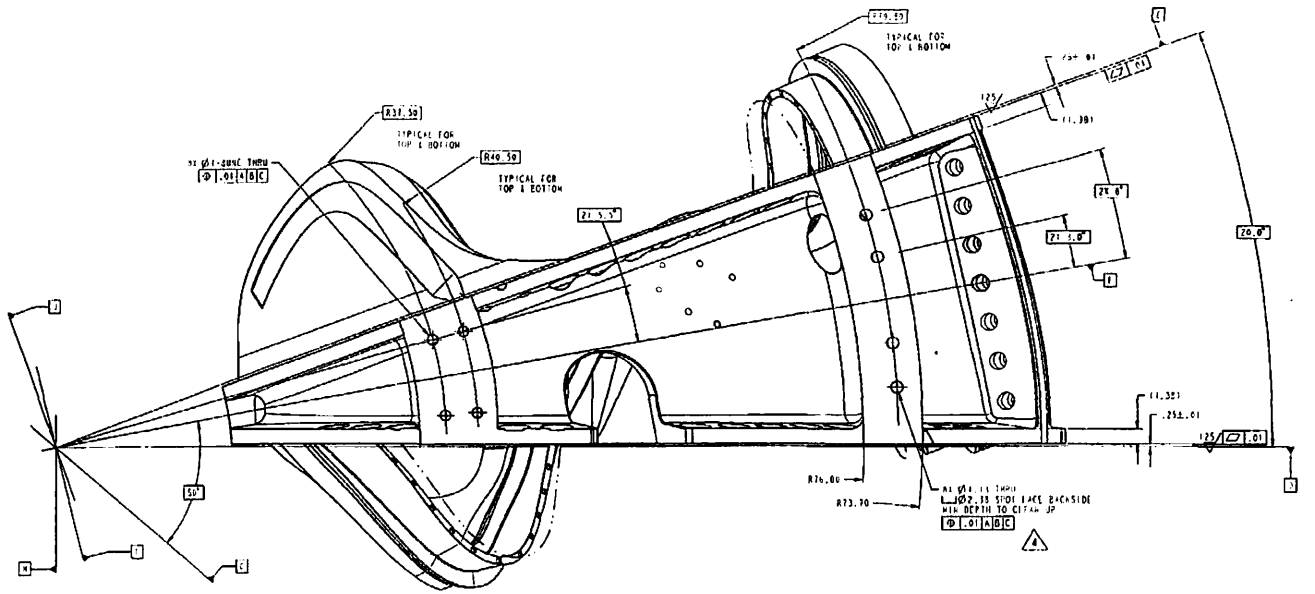
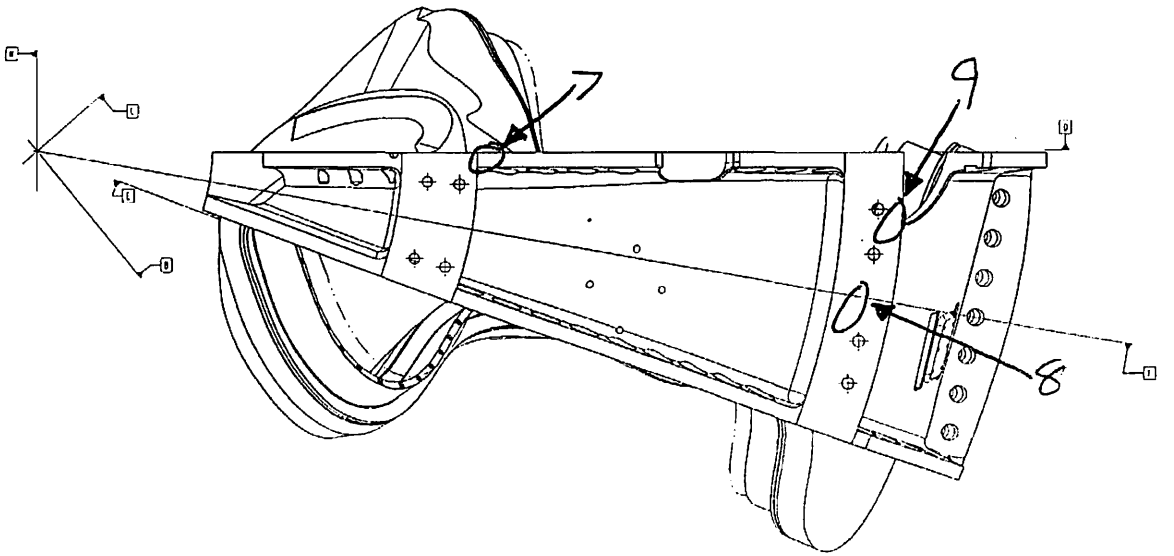
FOR NOTES AND PARTS LIST SEE SHEET 1



TOP VIEW
SCALE 0.25

DATUMS A, B, & C ARE FEATURE SPECIFIC.
ALL OTHER DATUMS LISTED ON THIS DRAWING
ARE SPECIFIC TO THIS PART



BOTTOM VIEW
SCALE 0.25

RELEASED FOR
FABRICATION / INSTALLATION
PPPL Drafting Jerry Siegel

UT-BATTELLE
NATIONAL COMPACT STELLARATOR EXPERIMENT
PRODUCTION WINDING FORM TYPE C
SIZE D
SCALE 1:5
SHEET 1 OF 1
SK141-116

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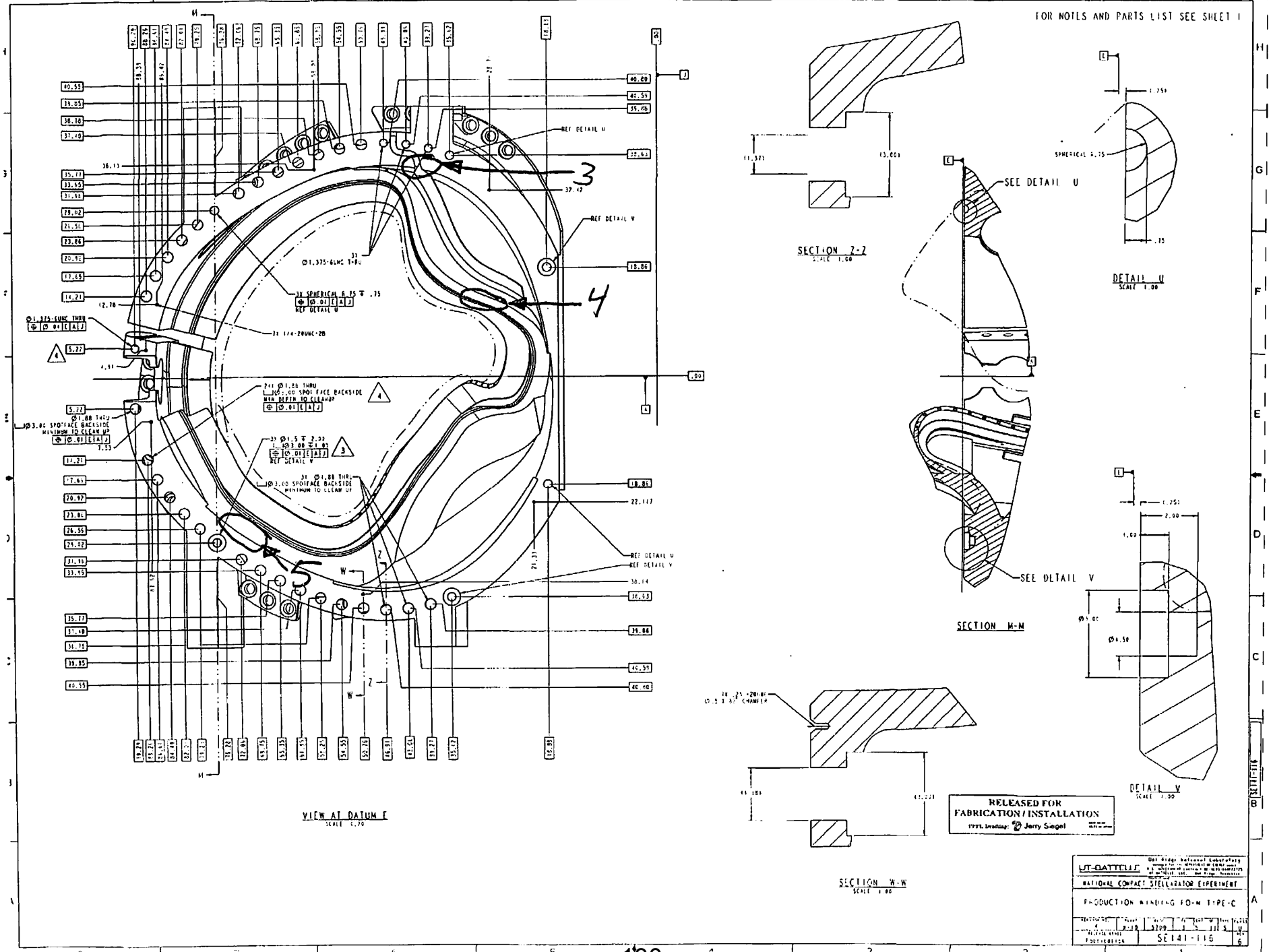
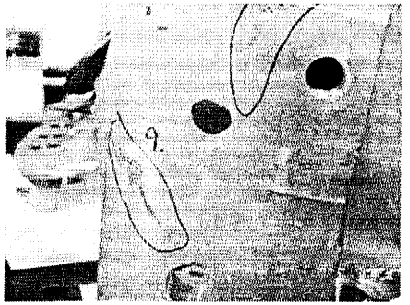
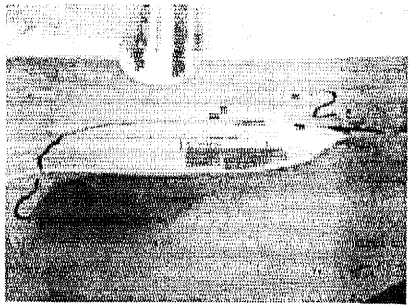
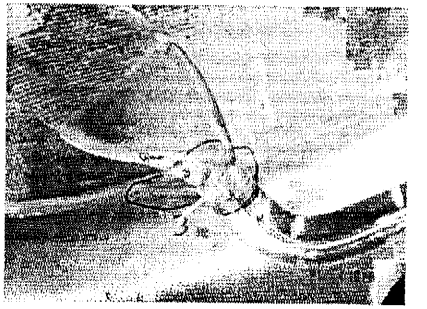
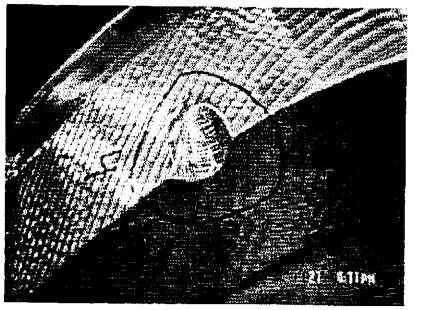

FOR NOTES AND PARTS LIST SEE SHEET 1
VIEW AT DATUM E
SCALE 1.70
SECTION Z-Z
SCALE 1.00
DETAIL U
SCALE 1.00
SECTION W-W
SCALE 1.00
SECTION M-M
DETAIL V
SCALE 1.00
RELEASED FOR FABRICATION / INSTALLATION
Jerry Siegel
UT-BATTELLE
NATIONAL COMPACT STELLARATOR EXPERIMENT
PRODUCTION WINDING FORM TYPE-C
SE141-116



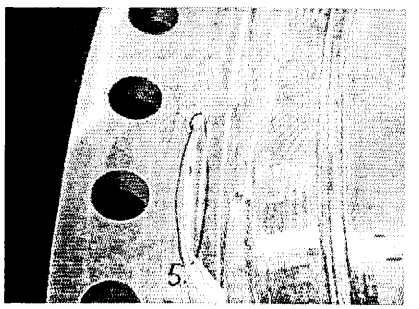


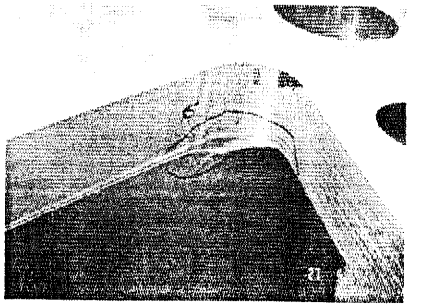


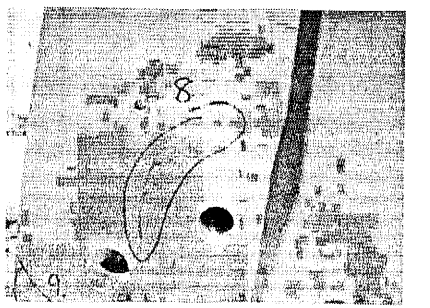


C1 MCWF

Photos for NC18237







K. Bowling 21-Sep-05

Major
Tool & Machine, Inc.

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 18238

Date: 09/21/05
User ID: BOWLINK

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON
E-Mail: NKHFlowcn@aol.com
Telephone: 216-496-2314
Fax: 216-328-2001

Part: SE141-116 / MODULAR COIL WINDING FORM TYPE
Drawing ID: SE141-116 Revision: 6
Customer P.O.: S005242-F/Ln:1
Serial No./Qty: C1

Reported By: KEVIN BOWLING
E-Mail: kBowling@MajorTool.com
Telephone: 317-636-6433
Fax: 317-634-9420

Problem: VIEWING PART FROM THE OUTSIDE LOOKING TOWARD THE POLOIDAL BREAK WITH DATUM E SIDE FACING UP THE (2) LEADBLOCK POCKETS ARE MACHINED OVERSIZE.

THE LEFT POCKET CHECKS 1.754
THE RIGHT POCKET CHECKS 1.625

PRINT DIMENSION IS 1.56" +/- .01

Proposed Disposition:
SUBMIT TO CUSTOMER CONTINUE MANUFACTURING.

Customer Disposition: [X] **Use As Is** [ ] **Rework** [ ] **Repair** [ ] **Scrap** [ ] **Replace**

PPPL WILL FIT APPROPRIATE G-11 CR SHIMS TO FILL GAPS WITH LOAD BLOCKS

Technical Contact Approval: _____ Title: Tech. Rep. Date: 9/22/05

RLM ~~Buyer~~ Approval: _____ Title: RLM Date: 9/22/05

Major Tool Implemented By: K. Bowling Title: PROG. MGR. Date: 23-SEP-05

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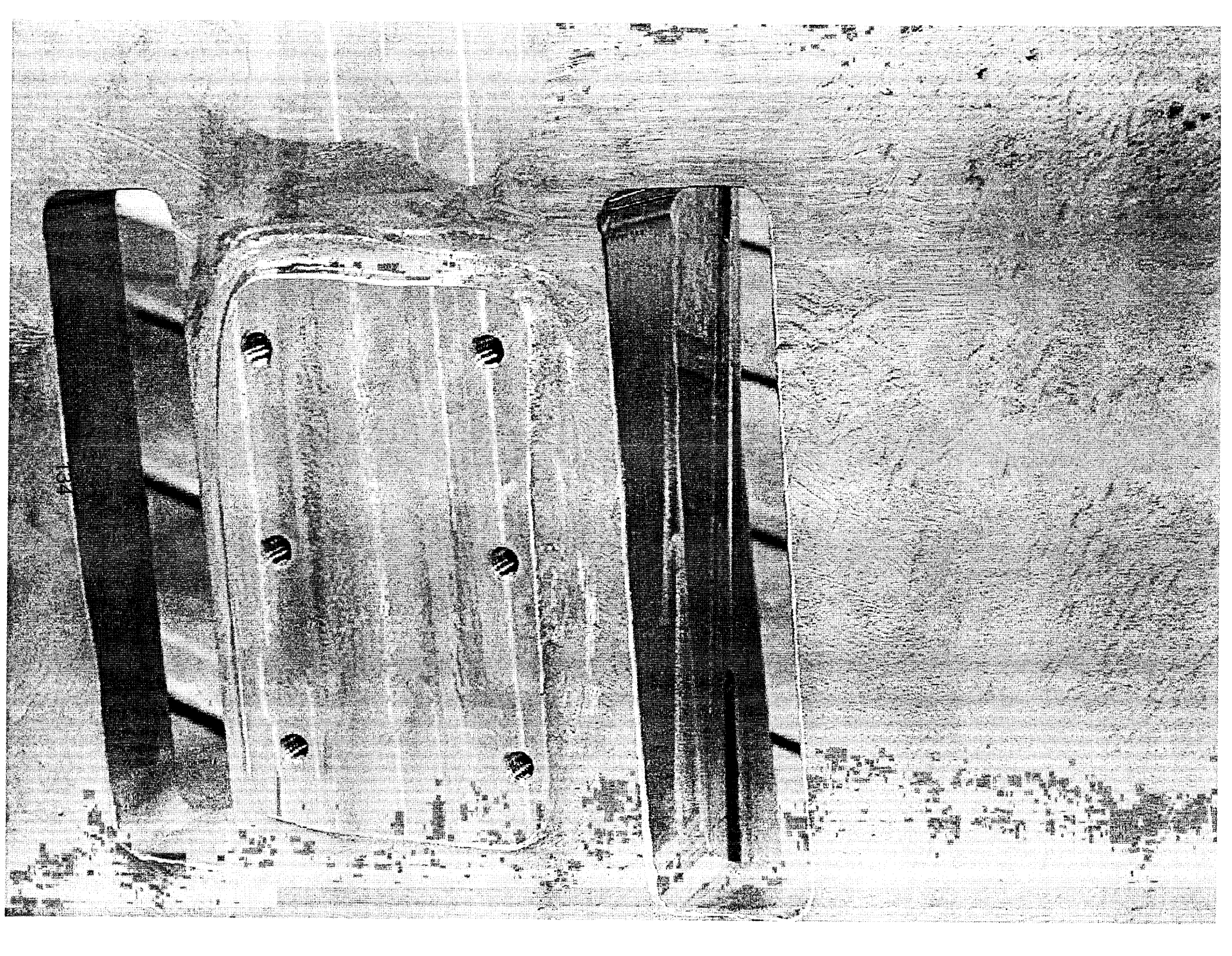

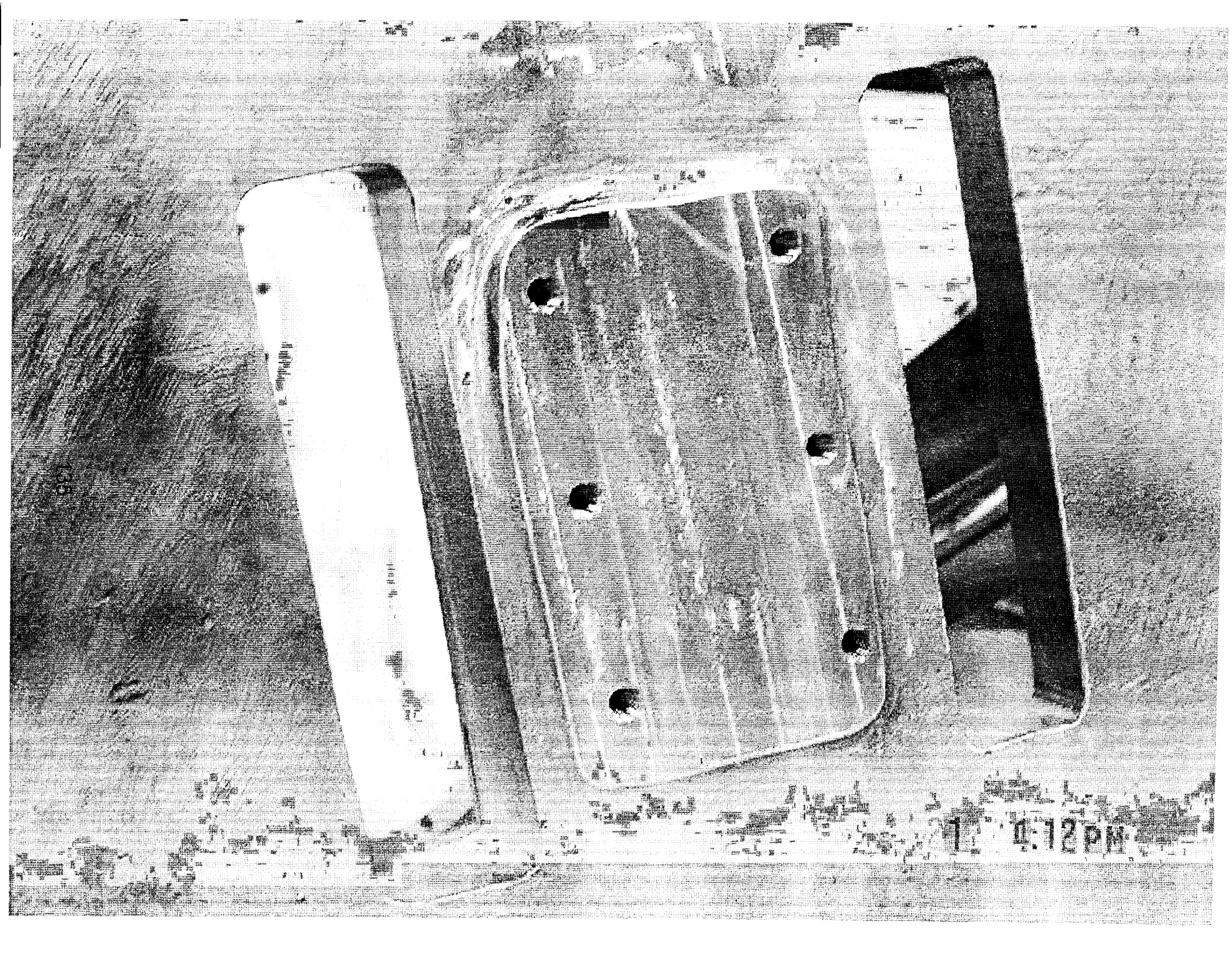
1 0:12PM

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON
E-Mail: NKHFlowen@aol.com
Telephone: 216-496-2314
Fax: 216-328-2001

Part: SE141-116 / MODULAR COIL WINDING FORM TYPE
Drawing ID: SE141-116 Revision: 6
Customer P.O.: S005242-F/Ln:1
Serial No./Qty: C1

Reported By: KEVIN BOWLING
E-Mail: kBowling@MajorTool.com
Telephone: 317-636-6433
Fax: 317-634-9420

Problem: Workorder: 65707/1.0 Sub:1 Op:120
Inspection Test #: 70 rejected: : {g|.5|A|B|C}: REFERENCE IGES INFORMATION
Inspection Test #: 140 rejected: P TO M: {g|.1|R|S|T}: REFERENCE IGES INFORMATION
Inspection Test #: 160 rejected: Q TO N: {g|.1|R|S|T}: REFERENCE IGES INFORMATION
Inspection Test #: 180 rejected: M TO N: {g|.02|R|S|T}: REFERENCE IGES INFORMATION
Inspection Test #: 250 rejected: : {f|.01}: .032
Inspection Test #: 260 rejected: : R76.00: REFERENCE IGES INFORMATION
Inspection Test #: 270 rejected: : R73.70: REFERENCE IGES INFORMATION
Inspection Test #: 280 rejected: 8X
Ø1.13 THRU
BACK SPOT FACE Ø2.38
MIN DEPTH FOR C'UP: {#|.01|A|B|C}: .010 - .031
Inspection Test #: 290 rejected: 3X Ø1.88 THRU Ø3.00 BACK SPOTFACE MIN TO CLEANUP: {#|.010|D|A|N}: .0304 - .0442 , >3.00 SPOT, 1.87 - 1.88 DIA.
Inspection Test #: 300 rejected: 3X SPH R.75 TO .75 DEEP: {#|d.01|D|A|N}: .019 - .020 , R .74 - .745
Inspection Test #: 310 rejected: 17X Ø1.88 THRU Ø3.00 BACK SPOTFACE MIN TO CLEANUP: {#|d.01|D|A|N}: .009 - .059, >3.00 SPOT, 1.87 - 1.88
Inspection Test #: 320 rejected: 3X Ø1.13
Ø2.38 BACK SPOTFACE
MIN TO CLEANUP: {#|d.01|D|A|N}: .047 - .054, 1.126 - 1.127
Inspection Test #: 340 rejected: 3X Ø1.375-6 UNC THRU: {#|d.01|D|A|N}: .022 - .039
Inspection Test #: 350 rejected: 5X Ø1.88 THRU Ø3.00 BACK SPOTFACE MIN TO CLEANUP: {#|d.01|D|A|N}: .0019 - .0182, >3.00 SPOT
Inspection Test #: 360 rejected: Ø1.88 THRU Ø3.00 BACK SPOTFACE MIN TO CLEANUP: {#|d.01|D|A|N}: .018, >3.00 SPOT, 1.879 DIA.
Inspection Test #: 380 rejected: Ø1.88 THRU Ø3.00 BACK SPOTFACE MIN TO CLEANUP: {#|d.01|E|A|J}: 0.77, >3.00 SPOT.
Inspection Test #: 410 rejected: 3X SPH R.75 TO .75 DEEP
: {#|d.01|E|A|J}: .020 - .021
Inspection Test #: 430 rejected: 24X Ø1.88 THRU Ø3.00 BACK SPOTFACE MIN TO CLEANUP: {#|d.01|E|A|J}: .008 - .040, >3.00 SPOT.
Inspection Test #: 440 rejected: 3X Ø1.5 TO 2.00 DEEP Ø3.00 TO 1.00 DEEP: {#|d.01|E|A|J}: .013 - .037
Inspection Test #: 550 rejected: : R7.00: REFERENCE IGES INFORMATION
Inspection Test #: 560 rejected: : 2X R1.50: REFERENCE IGES INFORMATION
Inspection Test #: 580 rejected: : 90`: 87.92
Inspection Test #: 610 rejected: : 6.50 ~ .010: 6.486
Inspection Test #: 620 rejected: : 3.06 ~ .010: REFERENCE IGES INFORMATION
Inspection Test #: 630 rejected: : R4.00 ~ .010: REFERENCE IGES INFORMATION
Inspection Test #: 640 rejected: : 2.10 ~ .010: REFERENCE IGES INFORMATION
Inspection Test #: 650 rejected: : 4.00 ~ .010: 3.98
Inspection Test #: 670 rejected: : R4.00 ~ .010: REFERENCE IGES INFORMATION
Inspection Test #: 690 rejected: : 9.38 ~ .010: REFERENCE IGES INFORMATION
Inspection Test #: 700 rejected: : 6.0`: REFERENCE IGES INFORMATION
Inspection Test #: 710 rejected: : d8.00 ~ .010: REFERENCE IGES INFORMATION
Inspection Test #: 720 rejected: : 5.9`: REFERENCE IGES INFORMATION
Inspection Test #: 730 rejected: : 7.81 ~ .010: REFERENCE IGES INFORMATION

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Inspection Test #: 740 rejected: : 7.25 ~ .010: REFERENCE IGES INFORMATION
Inspection Test #: 750 rejected: : 6X d..375-16 UNC TO .75 DEEP
.03 X 45` CHAMFER: ACCEPT THREAD/CHAMFER, .53 - 1.32 DEPTH
Inspection Test #: 780 rejected: : 2.19 ~ .010: 2.172 - 2.198
Inspection Test #: 790 rejected: : 2.19 ~ .010: 2.176 - 2.191
Inspection Test #: 830 rejected: : 2X 1.56 ~ .010 THRU: 1.) 1.56 2.) 1.79
Inspection Test #: 840 rejected: : 3.75 ~ .010: 3.90
Inspection Test #: 850 rejected: : 2X 7.50 ~ .010 THRU: 1.) 7.53 2.) 7.63
Inspection Test #: 860 rejected: : 8X R.25: .25 - .28
Inspection Test #: 870 rejected: : 2X 2.52 ~ .010: 2.04 - 2.08 , 2.65 - 2.66
Inspection Test #: 900 rejected: : 2.54 ~ .010: REFERENCE IGES INFORMATION
Inspection Test #: 910 rejected: : 5.08 ~ .010: REFERENCE IGES INFORMATION
Inspection Test #: 940 rejected: : 2.44 ~ .010: REFERENCE IGES INFORMATION
Inspection Test #: 950 rejected: : 1.22 ~ .010: REFERENCE IGES INFORMATION
Inspection Test #: 980 rejected: : {g|.125|A|B|C}: REFERENCE IGES INFORMATION
Inspection Test #: 990 rejected: : {g|.5|A|B|C}: REFERENCE IGES INFORMATION
Inspection Test #: 1000 rejected: : {g|.02|R|T|S}: REFERENCE IGES INFORMATION
Inspection Test #: 1010 rejected: : {g|.125|A|B|C}: REFERENCE IGES INFORMATION
Inspection Test #: 1020 rejected: : {g|.02|R|T|S}: REFERENCE IGES INFORMATION
Inspection Test #: 1030 rejected: : {g|.5|A|B|C}: REFERENCE IGES INFORMATION
Inspection Test #: 1040 rejected: UOS ALL MACHINED SURFACES TO BE 250 RMS SURFACE FINISH
RECORD RANGE: : 31 - 500
Inspection Test #: 1060 rejected: : 22.13 ~ .010: TAP
Inspection Test #: 1070 rejected: : 47.79 ~ .010: 47.76
Inspection Test #: 1080 rejected: : 59.18 ~ .010: 59.16
Inspection Test #: 1090 rejected: : 73.27 ~ .010: TAP
Inspection Test #: 1100 rejected: : 80.49: 80.46
Inspection Test #: 1110 rejected: : 87.87 ~ .010: 87.84
Inspection Test #: 1130 rejected: : 31.83 ~ .010: TAP
Inspection Test #: 1150 rejected: : 11.48 ~ .010: 11.46
Inspection Test #: 1240 rejected: : 28.17 ~ .010: TAP
Inspection Test #: 1270 rejected: : 43.42 ~ .010: TAP
Inspection Test #: 1300 rejected: : 86.42 ~ .010: 86.40
Inspection Test #: 1320 rejected: : 28.71 ~ .010: 28.69
Inspection Test #: 1390 rejected: : 4.91 ~ .010: 4.88
Inspection Test #: 1410 rejected: : 2.1`: REFERENCE IGES INFORMATION
Inspection Test #: 1420 rejected: : 2.63 ~ .010: 2.63 - 2.65

Proposed Disposition:
SUBMIT TO CUSTOMER CONTINUE MANUFACTURING AND QA ACTIVITY.

Number of additional pages:_____

Customer Disposition: [ ] Use As Is [ ] Rework [ ] Repair [ ] Scrap [ ] Replace

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Technical Contact Approval:_____ Title:_____ Date:_____

Buyer Approval:_____ Title:_____ Date:_____

Major Tool Implemented By: [signature] Title: QT ENGINEER Date: 1/16/2006

Nonconformance Report: 18297

Project Disposition:
MCWF C-1 has been accepted "as is". However, this does not relieve EIO from any of the requirements of NCSX-CSPEC-141-03 (latest revision) on future castings, for which full compliance with the Specification is expected unless otherwise agreed to in writing.

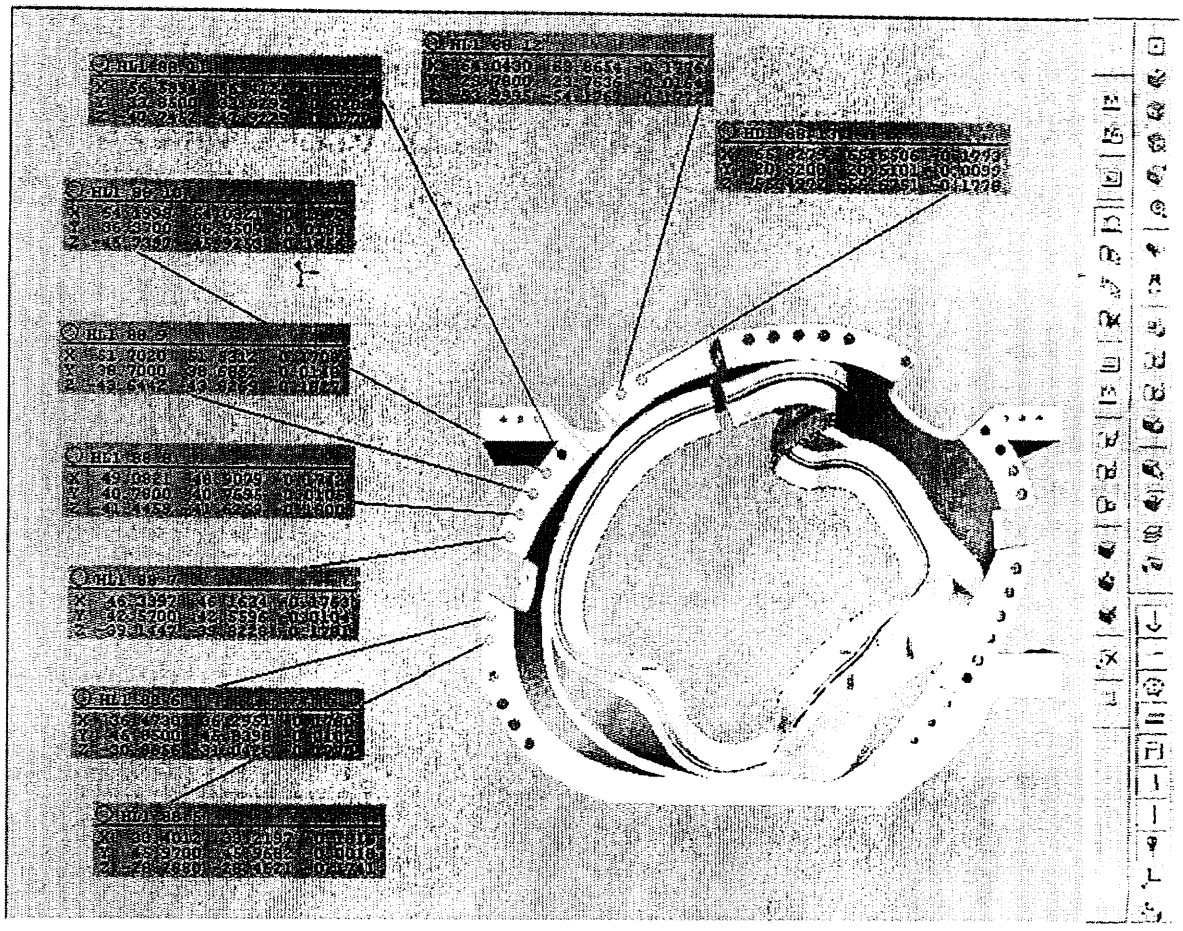
Approvals: Phil Heitzenroeder
Digitally signed by Phil Heitzenroeder
DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. Division
Reason: I am approving this document
Date: 2005.11.07 11:47:52 -05'00'

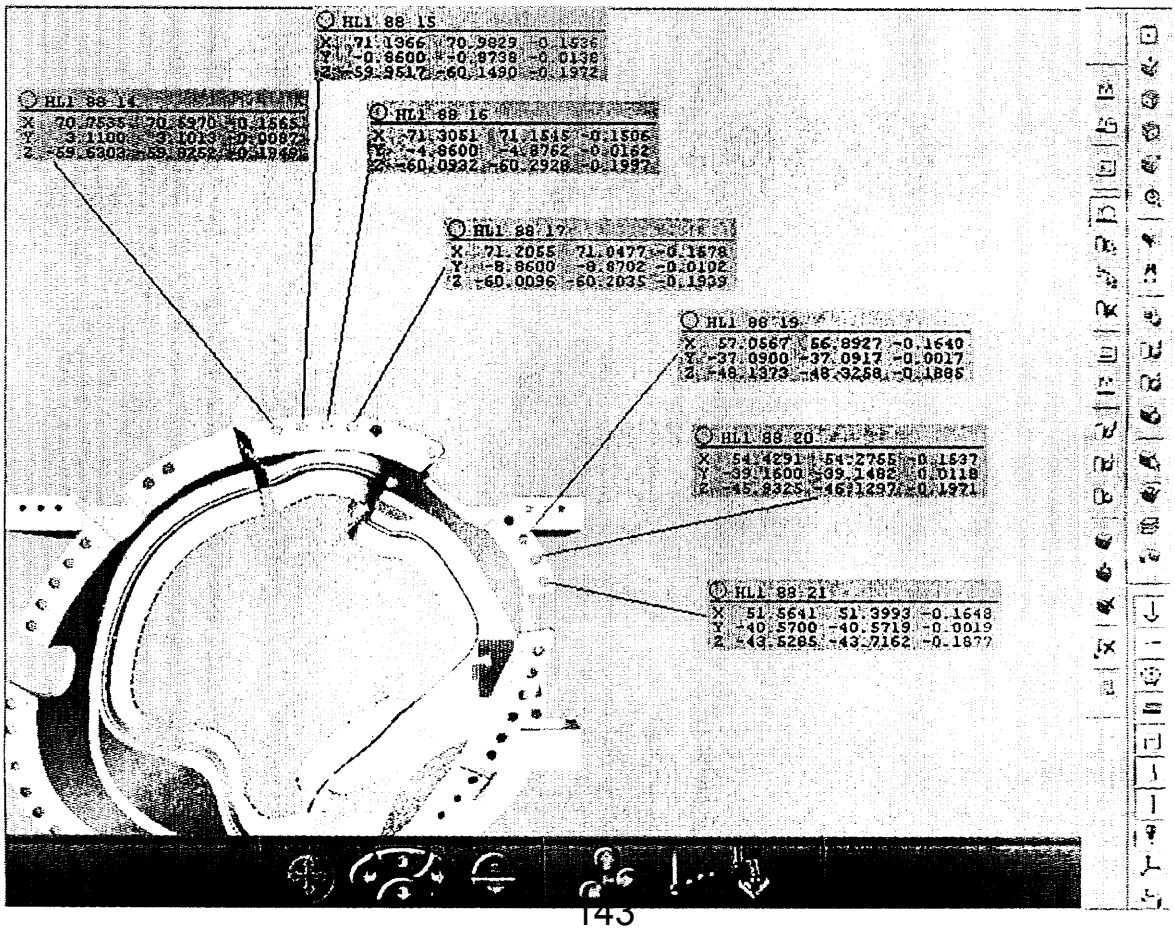
Procurement Technical Representative

Brad Nelson
Digitally signed by Brad Nelson
DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov
Date: 2005.11.07 13:20:40 -05'00'

Responsible Line Manager:

75RAD2
X -69.4146 -59.4130 -0.0016
Y -34.5800 -34.6590 -0.0090
Z -80.1911 -60.1765 -0.0046
75RAD1
X -28.9720 -28.9708 -0.0012
Y -31.8800 -31.8865 -0.0085
Z -24.6367 -24.6467 -0.0099

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X 71.1366 70.9829 -0.1536
Y -0.8600 -0.8738 -0.0138
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X 70.7535 70.5970 -0.1565
Y -3.1100 -3.1013 0.0087
Z -59.6303 -59.8252 -0.1949
HL1 88 16
X -71.3051 -71.1545 0.1506
Y -4.8600 -4.8762 -0.0162
Z -60.0932 -60.2928 -0.1997
HL1 88 17
X -71.2055 -71.0477 0.1578
Y -8.8600 -8.8702 -0.0102
Z -60.0096 -60.2035 -0.1939
HL1 88 19
X 57.0567 56.8927 -0.1640
Y -37.0900 -37.0917 -0.0017
Z -48.1373 -48.3258 -0.1885
HL1 88 20
X 54.4291 54.2755 -0.1537
Y -39.1600 -39.1482 0.0118
Z -45.2325 -46.1297 -0.1971
HL1 88 21
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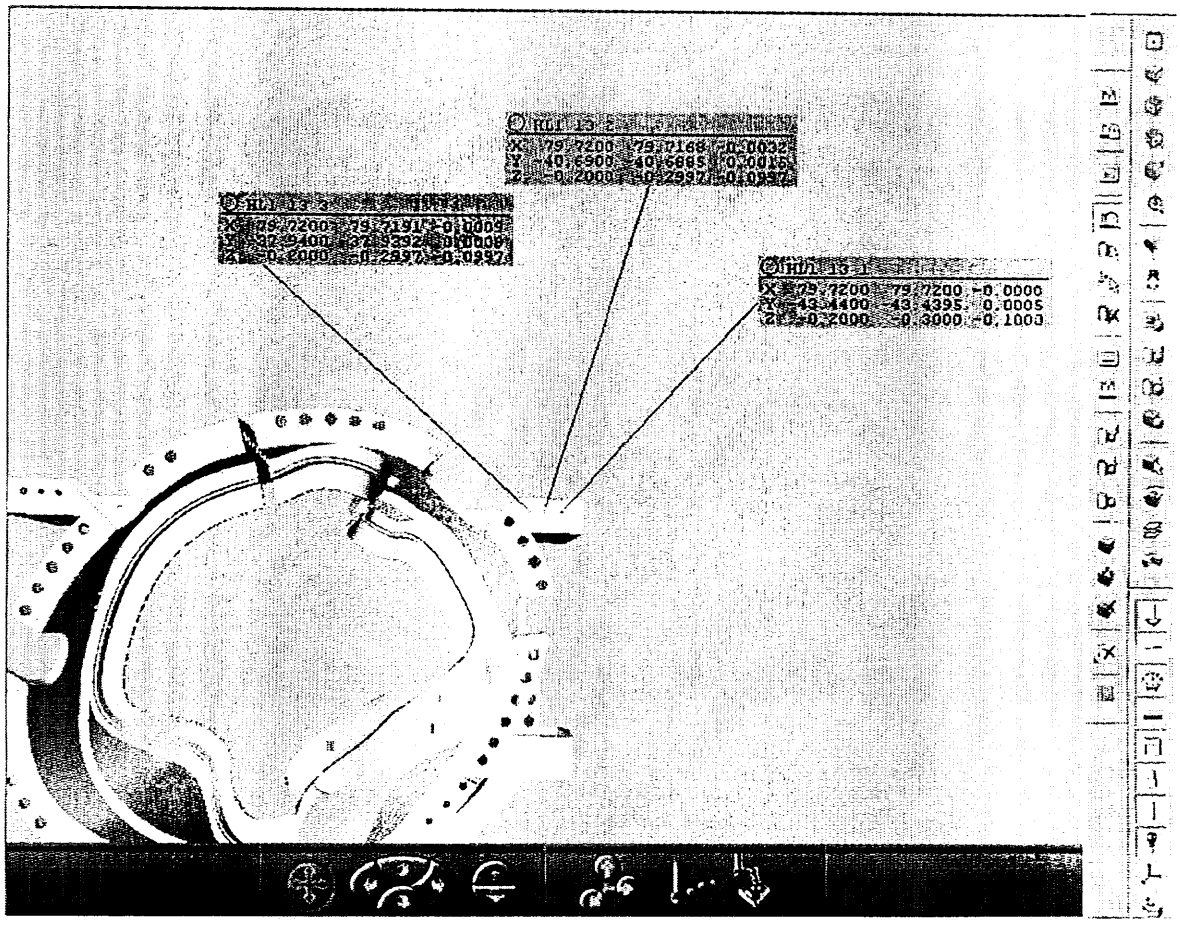

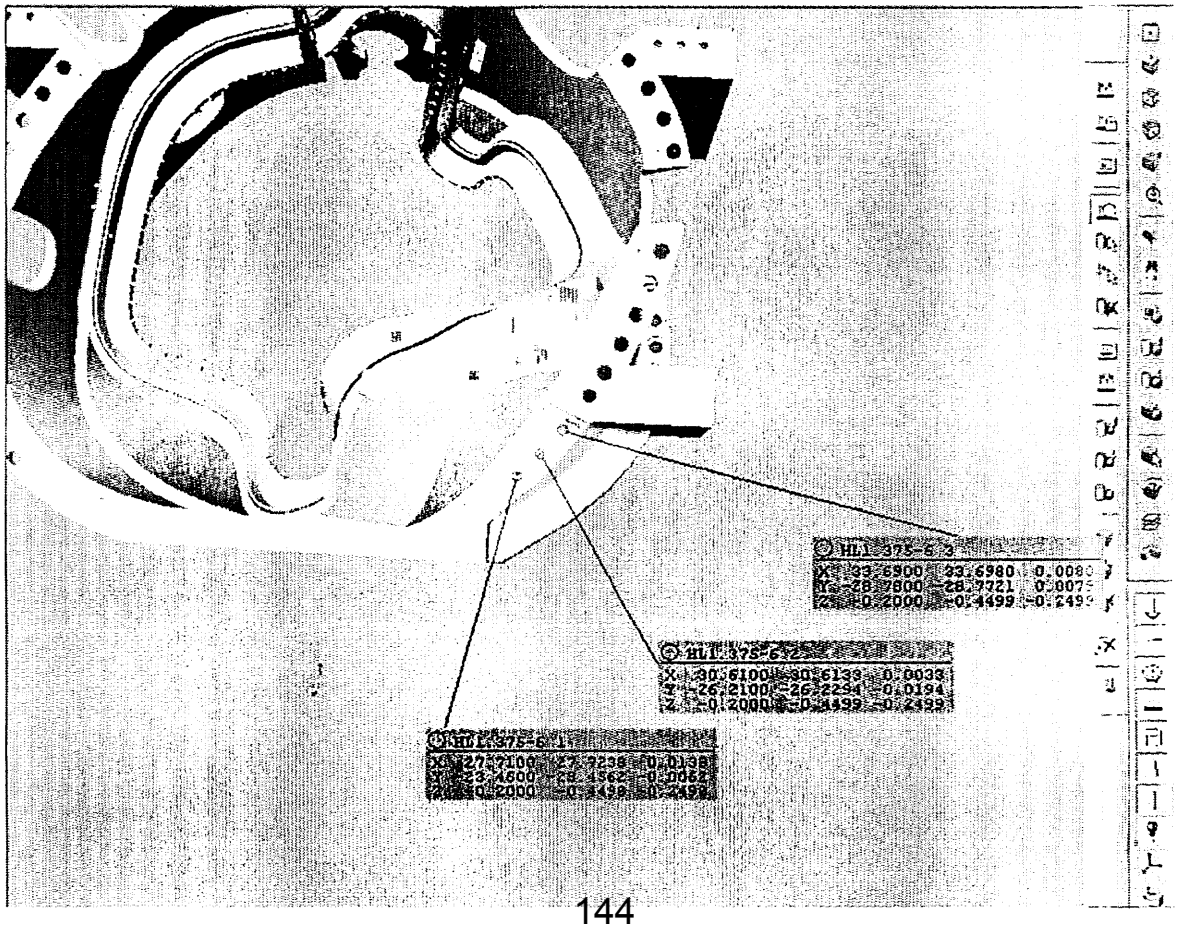

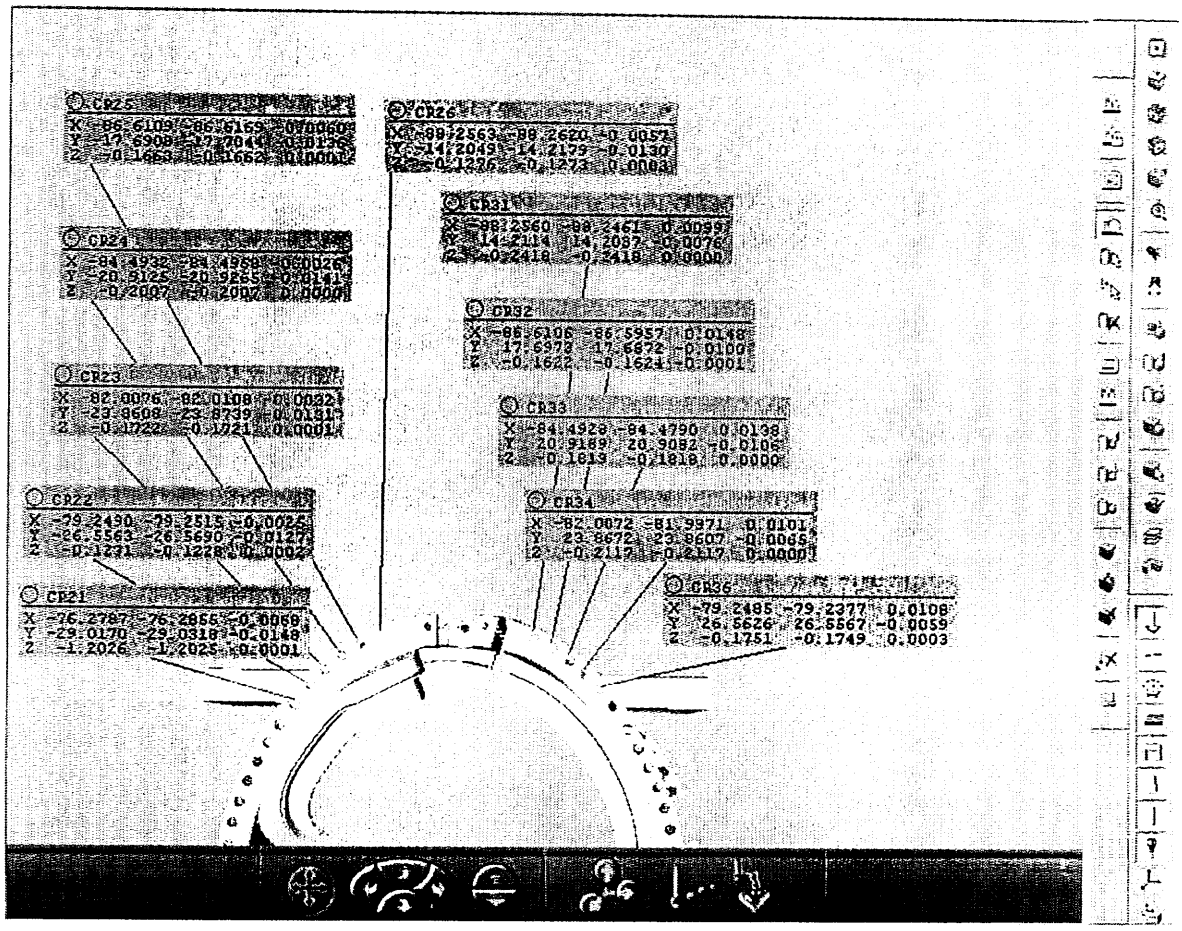

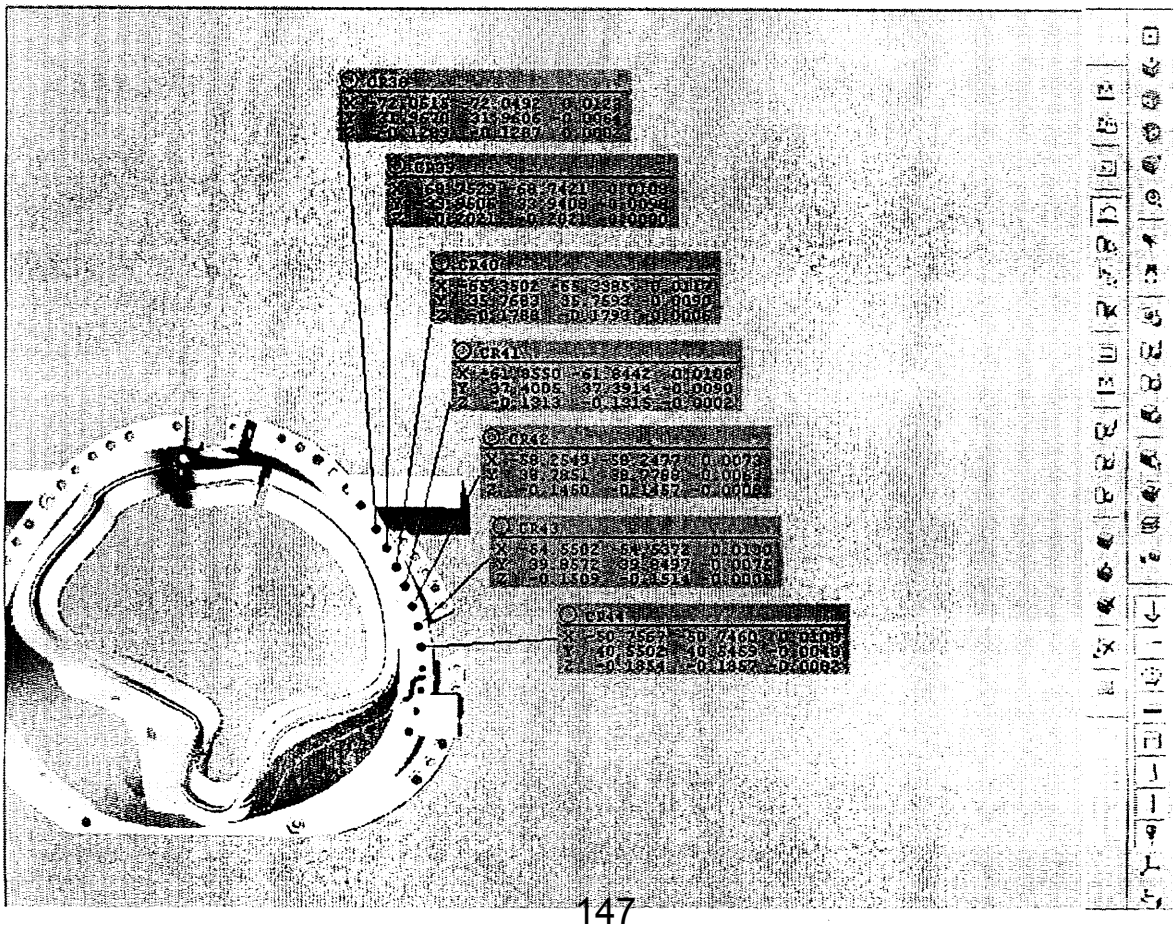

Evaluation done 9/30/05 prior to conditional release of C-4
S. Raftopoulos, T. Brown, D. Williamson, M. Cole, B. Nelson, J. Chrzanowski

Major Tool & Machine, Inc.

INSPECTION DATA CHECKLIST

Date: 09/30/05
User ID: BOWLINK#

Quality Assurance Documentation for Part ID: SE141-116 - Item: 15

Workorder: 65707/1-0 Sub:1 Op:120

Part: SE141-116 - MODULAR COIL WINDING FORM TYPE-C - PRODUCTION MODULAR COIL WINDING FORM TYPE-C

Drawing ID: SE141-116 Rev: 6			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
1* (10)	E8	47.19 ± .03	CMM	QA		00064	47.17 - 47.18	339-E.R 09-29-05			A
1* (11)	G8	R17.00 +.25 -.00	CMM	QA		00064	17.09	339-E.R 09-29-05			A
1* (20)	B8	47.19 ± .03	CMM	QA		00064	47.18 - 47.19	339-E.R 09-29-05			A
1* (30)	D6	47.19 ± .03	CMM	QA		00064	47.18 - 47.19	339-E.R 09-29-05			A
1* (40)	C6	47.19 ± .03	CMM	QA		00064	47.20	339-E.R 09-29-05			A
1* (50)		// .02 A	CMM	QA		00064	.0109	339-E.R 09-29-05			A
1* (60)	B6	// .02 A	CMM	QA		00064	.0045	339-E.R 09-29-05			A
1* (70)	F3	⌓ .5 A B C	CMM	QA		00064	REFERENCE IGES INFORMATION	339-E.R 09-29-05			A
2* (80)	H6	2X R.187 +.025 -.005	INDICATOR	QA		J-651	.185 - .187	339-E.R 09-29-05			A
2* (90)	G8	2X .03 X 45° w. chamfer, but .030 radius		QA		VISUAL	NOT PRESENT	339-E.R 09-29-05			R
2* (100)	G8	.40 ± .010	CALIPER	QA		J-707	.39 - .41	339-E.R 09-29-05			A
2* (110)	G8	2X .030 X 45°		QA		VISUAL	NOT PRESENT	339-E.R 09-29-05			R
2* (120)	F7	2X .32	CALIPER	QA		J-707	.31 - .33	339-E.R 09-29-05			A
2* (130)	F7	2X R.11	RADIUS GAGE	QA		R-25	.12	339-E.R 09-29-05			A
2* (140)	G6	⌓ .1 R S T P TO M	CMM	QA		00064	REFERENCE IGES INFORMATION	339-E.R 09-29-05			R
2*	G6	4.790 ± .005		QA		VISUAL	ACCEPT	339-E.R			A

Evaluation

Major Tool & Machine, Inc.

INSPECTION DATA CHECKLIST

(150)								09-29-05		
17 2* (160)	G3	⌓ .1 R S T Q TO N OK	CMM	QA		00064	REFERENCE IGES INFORMATION	339-E.R 09-29-05		R
? 18 2* (170)	G3	4.790 ± .005 RECORD NUMBER USED TO IDENTIFY POINT Q		QA		VISUAL	ACCEPT	339-E.R 09-29-05		A
19 2* (180)	F5	⌓ .02 R S T M TO N	CMM	QA		00064	REFERENCE IGES INFORMATION	339-E.R 09-29-05		R
20 2* (190)	C5	⌖ .01 R S T 96X Ø.375-16 UNC .188 DEEP OF C'BORE Ø.625 AS SHOWN	CMM THREAD PLUG GA	QA		00064 A-46	.0043 - .1657 , .62 3 - .626	339-E.R 09-29-05		R
21 2* (200)	B4	2X .03 X 45°		QA		? VISUAL	ACCEPT	339-E.R 09-29-05		A
22 3* (210)	G7	⌖ .01 A B C 8X Ø1-8 UNC THRU OF	CMM	QA		00064	.010 - .043	339-E.R 09-29-05		R
3* (220)	H4	.25 ± .01	CMM	QA		00064	SET ?	339-E.R 09-29-05		A
24 3* (230)	H3	▱ .01 OK	CMM	QA		00064	.015	339-E.R 09-29-05		R
25 3* (240)	F3	.25 ± .01	CMM	QA		00064	SET	339-E.R 09-29-05		A
26 3* (250)	F3	▱ .01 OF	CMM	QA		00064	.032 Compared to Site, looks high	339-E.R 09-29-05		R Kevin to check
3* (260)	F5	R76.00 OK	CMM	QA		00064	REFERENCE IGES INFORMATION	339-E.R 09-29-05		R
3* (270)	E5	R73.70 OK	CMM	QA		00064	REFERENCE IGES INFORMATION	339-E.R 09-29-05		R
3* (280)	E4	⌖ .01 A B C 8X Ø1.13 THRU OF BACK SPOT FACE Ø2.38 MIN DEPTH FOR C'UP	CMM	QA		00064	.010 - .031	339-E.R 09-29-05		R
4*	H8	⌖ .010 D A N 3X Ø1.88 THRU OK Ø3.00 BACK SPOTFACE	CMM	QA		00064	.0304 - .0442 , >3.00 SPOT, 1.87 - 1.88 DIA.	339-E.R		R

learn to use sphere go-not go gauge

Major Tool & Machine, Inc.

INSPECTION DATA CHECKLIST

(290)		MIN TO CLEANUP	SCALE			J-922		09-29-05		
4* (300)	H7	⌖ Ø.01 D A N 3X SPH R.75 TO .75 DEEP	CMM	QA		00064	.019 - .020 , R .7 4 - .745	339-E.R 09-29-05		R
4* (310)	H6	⌖ Ø.01 D A N 17X Ø1.88 THRU Ø3.00 BACK SPOTFACE MIN TO CLEANUP OK	CMM SCALE	QA		00064 J-922	.009 - .059, >3.00 SPOT, 1.87 - 1.88	339-E.R 09-29-05		R
4* (320)	H5	⌖ Ø.01 D A N 3X Ø1.13 Ø2.38 BACK SPOTFACE MIN TO CLEANUP OK	CMM	QA		00064	.047 - .054, 1.126 - 1.127	339-E.R 09-29-05		R
4* (340)	E6	⌖ Ø.01 D A N 3X Ø1.375-6 UNC THRU OK	CMM	QA		00064	.022 - .039	339-E.R 09-29-05		R
4* (350)	E6	⌖ Ø.01 D A N 5X Ø1.88 THRU Ø3.00 BACK SPOTFACE MIN TO CLEANUP OK	CMM SCALE	QA		00064 J-922	.0019 - .0182, >3.00 SPOT	339-E.R 09-29-05		R
4* (360)	D4	⌖ Ø.01 D A N Ø1.88 THRU Ø3.00 BACK SPOTFACE MIN TO CLEANUP OK	CMM	QA		00064	.018, >3.00 SPOT, 1.879 DIA.	339-E.R 09-29-05		R
4* (370)	B5	⌖ Ø.01 D A N 3X Ø1.13 Ø2.38 BACK SPOTFACE MIN TO CLEANUP OK	CMM SCALE	QA		00064 J-922	.001 - .007, >2.38 SPOT.	339-E.R 09-29-05		A
5* (380)	E8	⌖ Ø.01 E A J Ø1.88 THRU Ø3.00 BACK SPOTFACE MIN TO CLEANUP OK	CMM SCALE	QA		00064 J-922	0.77, >3.00 SPOT. To close or marked?	339-E.R 09-29-05		R
5* (400)	F6	3X Ø1.375-6 UNC THRU	THREAD PLUG GA	QA		A-375	ACCEPT	339-E.R 09-29-05		A
5* (410)	F6	⌖ Ø.01 E A J 3X SPH R.75 TO .75 DEEP OK	CMM	QA		00064	.020 - .021	339-E.R 09-29-05		R
5* (420)	F7	7X .25-20 UNC -2B	THREAD PLUG GA	QA		A-67	ACCEPT	339-E.R 09-29-05		A
5*	E7	⌖ Ø.01 E A J 24X Ø1.88 THRU Ø3.00 BACK SPOTFACE OK	CMM	QA		00064	.008 - .040, >3.00 SPOT.	339-E.R		R

Major Tool & Machine, Inc.

INSPECTION DATA CHECKLIST

(430)		MIN TO CLEANUP	SCALE			J-922		09-29-05			
5* (440)	E7	⌖ Ø.01 E A J 3X Ø1.5 TO 2.00 DEEP OK Ø3.00 TO 1.00 DEEP	CMM	QA		00064	.013 - .037	339-E.R 09-29-05			R
5* (450)	D7	3X Ø1.88 THRU Ø3.00 BACK SPOTFACE MIN TO CLEANUP OK	CMM SCALE	QA		00064 J-922	1.87 - 1.88, >3.00	339-E.R 09-29-05			A
5* (460)	G2	SPH R.75 TO .75 DEEP	CMM	QA		00064	.736 - .74	339-E.R 09-29-05			A
6* (510)	F2	▱ .02 Radial Break	05	QA							
6* (520)	F2	1.125 ± .010	05	QA							
6* (530)	F2	2.250 ± .010	05	QA							
6* (540)	E2	⌖ Ø.01 F P V 7X Ø1.625 THRU BOTH SIDES 14X Ø3.00 TO .500 BOTH SIDES	05	QA							
7* (550)	G2	R7.00 OK	05	QA			REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
7* (560)	F2	2X R1.50 OK	05	QA			REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
7* (570)	E2	2.52 ± .010	CMM	QA		00064	2.51	339-E.R 09-29-05			A
7* (580)	E2	90° OK	CMM	QA		00064	87.92	339-E.R 09-29-05			R
7* (590)	E1	2.0°	CMM	QA		00064	2.04	339-E.R 09-29-05			A
7* (600)	E2	2.64 ± .010	DEPTH MICROMET	QA		J-851	2.64	339-E.R 09-29-05			A
7* (610)	E2	6.50 ± .010 OK	CMM	QA		00064	6.486	339-E.R 09-29-05			R
7* (620)	E2	3.06 ± .010 OK	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R

7* (630)	D2	R4.00 ± .010	CMM	QA		00064	REFERENCE IGES INFRMATION	339-E.R 09-29-05			R
7* (640)	D3	2.10 ± .010	CMM	QA		00064	REFERENCE IGES INFRMATION	339-E.R 09-29-05			R
8* (650)	G7	4.00 ± .010	CMM	QA		00064	3.98 hb OK SR	339-E.R 09-29-05	OK 12		R
8* (660)	G7	.25 ± .010	CMM	QA		00064	SET ?	339-E.R 09-29-05	OK 12		A
8* (670)	G7	R4.00 ± .010 Need to get actual data	CMM	QA		00064	REFERENCE IGES INFRMATION	339-E.R 09-29-05			R/NP data
8* (680)	F7	2.00 ± .010	CMM	QA		00064	1.99	339-E.R 09-29-05			A
8* (690)	E3	9.38 ± .010 Can't verify OK should be ref.	CMM	QA		00064	REFERENCE IGES INFRMATION	339-E.R 09-29-05			R
8* (700)	E2	6.0° Need cloud data can't locate	CMM	QA		00064	REFERENCE IGES INFRMATION	339-E.R 09-29-05			R
8* (710)	C2	Ø8.00 ± .010 Need cloud pt data	CMM	QA		00064 -7.993	REFERENCE IGES INFRMATION	339-E.R 09-29-05			R
8* (720)	B3	5.9° Need cloud data	CMM	QA		00064	REFERENCE IGES INFRMATION	339-E.R 09-29-05			R
8* (730)	B3	7.81 ± .010 need cloud data	CMM	QA		00064	REFERENCE IGES INFRMATION	339-E.R 09-29-05			R
8* (740)	C6	7.25 ± .010 acceptable	CMM	QA		00064	REFERENCE IGES INFRMATION	339-E.R 09-29-05			R
8* (750)	D7	6X Ø..375-16 UNC TO .75 DEEP .03 X 45° CHAMFER acceptable	THREAD PLUG GA CALIPER	MFG		A-46 J-707	ACCEPT THREAD/CHAER, .53 - 1.32 DEPTH	339-E.R 09-29-05			R
8* (760)	D7	13.6 °	CMM	MFG		00064	13.16	339-E.R 09-29-05			A
8* (770)	D7	5.88 ± .010	CALIPER	QA		J-707	5.89	339-E.R 09-29-05			A
8* (780)	D7	2.19 ± .010 OK	CMM	QA		00064	2.172 - 2.198	339-E.R 09-29-05			R
8* (790)	D7	2.19 ± .010 OK	CMM	QA		00064	2.176 - 2.191	339-E.R 09-29-05			R
8* (800)	B7	4X R.50	RADIUS GAGE	QA		R-25	.50	339-E.R 09-29-05			A

8* (810)	B7	3.50 ± .010	CALIPER	QA		J-707	3.60	339-E.R 09-29-05			A
8* (820)	B7	1.75 ± .010	SCALE	QA		J-922	1.75	339-E.R 09-29-05			A
8* (830)	C8	2X 1.56 ± .010 THRU OK	CMM	QA		00064	1.) 1.56 2.) 1.79	339-E.R 09-29-05			R
8* (840)	C8	3.75 ± .010 OK	CMM	QA		00064	3.90	339-E.R 09-29-05			R
8* (850)	C8	2X 7.50 ± .010 THRU OK	CMM	QA		00064	1.) 7.53 2.) 7.63	339-E.R 09-29-05			R
8* (860)	C8	8X R.25 OK	RADIUS GAGE	QA		R-25	.25 - .28	339-E.R 09-29-05			R
8* (870)	C8	2X 2.52 ± .010 OK	CMM	QA		00064	2.04 - 2.08 , 2.65 - 2.66	339-E.R 09-29-05			R
8* (880)	E2	Ø8.00 ± .010 OK	CMM	QA		00064	7.992	339-E.R 09-29-05			A
9* (890)	F7	4X Ø.63 ± .010 THRU	PIN GAGE	QA		J-652	.62	339-E.R 09-29-05			A
9* (900)	E7	2.54 ± .010 OK	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
9* (910)	E7	5.08 ± .010 OK	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
9* (920)	F3	4X Ø.63 ± .010 THRU	PIN GAGE	QA		J-652	SEE #890	339-E.R 09-29-05			A
9* (930)	F3	2X Ø .50 ± .010 THRU	PIN GAGE	MFG		J-652	.498	339-E.R 09-29-05			A
9* (940)	E3	2.44 ± .010 need to resolve	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
9* (950)	E3	1.22 ± .010	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
9* (960)	C7	4X Ø.63 ± .010 THRU	PIN GAGE	QA		J-652	.622 - .624	339-E.R 09-29-05			A
9* (970)	C6	2X Ø.25 T.C. HOLE TO 2.5 DEEP	PIN GAGE	QA		J-652	.24	339-E.R 09-29-05			A
10* (980)	C8	⌓ .125 A B C OK	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
10*	C8	⌓ .5 A B C OK	CMM	QA		00064	REFERENCE IGES INF	339-E.R			R

(990)							RMATION	09-29-05			
10* (1000)	C5	⌓ .02 R T S OK	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
10* (1010)	C4	⌓ .125 A B C OK	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
10* (1020)	G1	⌓ .02 R T S OK	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
10* (1030)	E1	⌓ .5 A B C OK	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
* (1040)		OK UOS ALL MACHINED SURFACES TO BE 250 RMS SURFACE FINISH RECORD RANGE	PROFILOMETER	QA		J-1152	31 - 500	339-E.R 09-29-05			R
1* (1050)		RECORD THE WEIGHT OF THE PART 6000LBS MAX		QA		SCALE	5080LBS	339-E.R 09-29-05			A
4* (1060)	H7	22.13 ± .010 ? what is this	CMM	QA		00064	TAP	339-E.R 09-29-05			R
4* (1070)	H7	47.79 ± .010 OK	CMM	QA		00064	47.76	339-E.R 09-29-05			R
4* (1080)	H6	59.18 ± .010 OK	CMM	QA		00064	59.16	339-E.R 09-29-05			R
4* (1090)	H6	73.27 ± .010 OK	CMM	QA		00064	TAP	339-E.R 09-29-05			R
4* (1100)	H5	80.49 OK	CMM	QA		00064	80.46	339-E.R 09-29-05			R
4* (1110)	H5	87.87 ± .010 OK	CMM	QA		00064	87.84	339-E.R 09-29-05			R
4* (1120)	H5	89.64 ± .010 OK	CMM	QA		00064	89.64	339-E.R 09-29-05			A
4* (1130)	G4	31.83 ± .010 OK	CMM	QA		00064	TAP	339-E.R 09-29-05			R
4* (1140)	F4	24.10 ± .010 OK	CMM	QA		00064	24.08	339-E.R 09-29-05			A
4* (1150)	F4	11.48 ± .010 OK	CMM	QA		00064	11.46	339-E.R 09-29-05			R

Confirm what "tap" means ☆

5* (1340)	D4	22.117 ± .005	CMM	QA		00064	22.118	339-E.R 09-29-05			A
5* (1350)	D4	38.14 ± .010	CMM	QA		00064	38.14	339-E.R 09-29-05			A
5* (1360)	D5	21.33 ± .010	CMM	QA		00064	21.32	339-E.R 09-29-05			A
5* (1370)	D7	87.62 ± .010	CMM	QA		00064	87.63	339-E.R 09-29-05			A
5* (1380)	E8	7.53 ± .010	CMM	QA		00064	7.53	339-E.R 09-29-05			A
5* (1390)	E8	4.91 ± .010 OK	CMM	QA		00064	4.88	339-E.R 09-29-05			R
5* (1400)	G8	36.13 ± .010	CMM	QA		00064	36.12	339-E.R 09-29-05			A
7* (1410)	D4	2.1° OK	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
8* (1420)	D8	2.63 ± .010 OK	CMM	QA		00064	2.63 - 2.65	339-E.R 09-29-05			R

4* (1160)	E4	5.20 ± .010	CMM	QA		00064	5.19	339-E.R 09-29-05			A
4* (1170)	D4	18.31 ± .010	CMM	QA		00064	18.32	339-E.R 09-29-05			A
4* (1180)	D4	32.50 ± .010	CMM	QA		00064	32.50	339-E.R 09-29-05			A
4* (1190)	C5	77.13 ± .010	CMM	QA		00064	77.13	339-E.R 09-29-05			A
4* (1200)	C6	55.56 ± .010	CMM	QA		00064	55.55	339-E.R 09-29-05			A
4* (1210)	B7	23.74 ± .010	CMM	QA		00064	23.73	339-E.R 09-29-05			A
4* (1220)	C7	37.09 ± .010	CMM	QA		00064	37.08	339-E.R 09-29-05			A
4* (1230)	D8	17.22 ± .010	CMM	QA		00064	17.23	339-E.R 09-29-05			A
4* (1240)	F8	28.17 ± .010 OK	CMM	QA		00064	TAP	339-E.R 09-29-05			R
4* (1250)	G8	12X .250-20 UNC-2B	THREAD PLUG GA	QA		A-517 VISUAL	ACCEPT	339-E.R 09-29-05			A
4* (1260)	G8	40.75 ± .010	CMM	QA		00064	40.74	339-E.R 09-29-05			A
4* (1270)	G8	43.42 ± .010 OK	CMM	QA		00064	TAP	339-E.R 09-29-05			R
4* (1280)	D1	12X .25-20 UNC Ø.5 X 82° INCL. CHAMFER	THREAD PLUG GA	QA		A-517 VISUAL	ACCEPT	339-E.R 09-29-05			A
5* (1290)	H8	88.39 ± .010	CMM	QA		00064	88.39	339-E.R 09-29-05			A
5* (1300)	H7	86.42 ± .010 OK	CMM	QA		00064	86.40	339-E.R 09-29-05			R
5* (1310)	H6	59.08 ± .010 OK	CMM	QA		00064	59.06	339-E.R 09-29-05			A
5* (1320)	H5	28.71 ± .010 OK	CMM	QA		00064	28.69	339-E.R 09-29-05			R
5* (1330)	G5	32.42 ± .010	CMM	QA		00064	32.41	339-E.R 09-29-05			A

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 18315

Page: 1
Date: 10/03/05
User ID: BOWLINK

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON — Telephone: 216-496-2314
E-Mail: NKHFlowen@aol.com — Fax: 216-328-2001

Part: SE141-116 / MODULAR COIL WINDING FORM TYPE — Customer P.O.: S005242-F/Ln:1
Drawing ID: SE141-116 — Revision: 6 — Serial No./Qty: C1

Reported By: KEVIN BOWLING — Telephone: 317-636-6433
E-Mail: kBowling@MajorTool.com — Fax: 317-634-9420

Problem: THE FOLLOWING INSPECTION STEPS PER MTM SUBMITTED IDC REPORT DID NOT HAVE SUPPORTING DIMENSIONAL DATA FROM THE CMM:

510, 520, 530, 540, 620, 630, 640, 670, 690, 700, 710, 720, 730, 740, 900, 910, 940, 950,

ALSO ONE OF THE FLANGE FACES DID NOT HAVE THE 2" X 2" GRID POINTS IN THE IGES FILE AS REQUIRED BY THE PRODUCT SPECIFICATION.

Proposed Disposition:
SUBMIT TO CUSTOMER CONTINUE MANUFACTURING.

Customer Disposition: X Use As Is [ ] Rework [ ] Repair [ ] Scrap [ ] Replace

MTM is to take corrective actions to provide all supporting data from the CMM on subsequent winding forms. To address the situation in the flanges which resulted in inadequate dimensional information, Rev. 10 of NCSX-CSPEC-141-03 has been revised as indicated below:

4.2.5 Verification of Dimensions and Tolerances

All cast surfaces, machined surfaces and features such as holes, ports, supports, etc. shall be dimensionally checked to assure compliance with Section 3.2.2. Cast surfaces shall be checked with measurements taken to approximate 4" x 4" grid; machined surfaces shall be checked with measurements taken to approximate a 2" x 2" grid; features such as holes, ports, supports, etc. shall be verified per standard machine shop practices. On the winding tee flange, where a 2" x 2" grid would result in a single line of measurements, a minimum of 2 readings (two lines of measurements) shall be recorded.

Phil Heitzenroeder

Digitally signed by Phil Heitzenroeder
DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. Division
Reason: I agree to 'specified' portions of this document
Date: 2005.11.28 20:11:23 -05'00'

Brad Nelson

Digitally signed by Brad Nelson
DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov
Date: 2005.11.29 08:22:00 -05'00'

Major Tool Implemented By: [signature] Title: QT ENGINEER Date: 1/16/2006

c:\...\14.qp

Major Tool and Machine, Inc. 1458 East 19th Street, Indianapolis, IN 46218-4289 Tel: 317-636-6433 Fax: 317-634-9420

PPPL NONCONFORMANCE REPORT NO: 3617 Open Date 10/10/05

Status	9 - Closed NCR	Trend	01-Deviation From Doc/Proc
Department	NCSX	Division	NCSX Project
Source/Org	VENDOR		
Item Dwg/Part#	SE141-116,Rev 6	Procurement #	S005242-F
Cost Center	9450 1*** 1404		
RAP#	3209	Job Doc #	S005242-F
Vendor	Energy Industries of Ohio		
RAP Title	NCSX - Modular Coil Winding Forms		

☐ HoldTag Applied

Nonconforming Condition (include requirement(s) violated):

C-1 MCWF - Web hole numbering information was extracted from drawing SE141-123 and sent to the supplier by email. It shows the #1 hole near the center of the lead block opening and the numbering increasing in the direction of the poloidal break. The stamped numbering does not follow this scheme. The first number, proceeding from the lead block openings toward the poloidal break, is 95.

Lot Size Recd 1 Sample Size Insp 1 ☑ Lot Reje... # Rejected 1

Reported By Williamson Validated By Malinowski F Validated Date 10/06/05

Disposition: Rework*__ Repair*__ Use As Is*__ Return To Vendor*__ Scrap*___ Use As Is

MTM recognized their error on this casting and will take care to insure that it's corrected on future castings. See attached MTM N/C 18588.

For rework or repair of vendor supplied equipments, fill in information below:

#Hours _____ $Est Labor _____ $G&A _____

$Material _____ $Burden _____ $Total _____

Disposition By	Heitzenroeder P	Date	11/18/05
Supervisor's Concur	Williams M	Date	11/18/05
Eng. Dept. Head Concur	Williams M	Date	11/18/05
WCO/Other	N/A	Date	
PQA/QC Mgr Dispos Concur	Malinowski F	Date	11/21/05
QC Field Verification By	Phelps C	Date	11/23/05

Distribution

Cog Heitzenroeder P
Insp Various
Proj. Doc Control (when closed)
QC Files
Malsbury J
Boscoe J
Chrzanowski J
Sutton L
Malinowski F
Raftopoulos S
Nelson B
Williams M
Reiersen W
Lumberger J
Tyrrell M

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 18588

Date: 11/09/05
User ID: BOWLINK

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON
E-Mail: NKHFlowen@aol.com
Telephone: 216-496-2314
Fax: 216-328-2001

Part: SE141-116 / MODULAR COIL WINDING FORM TYPE
Drawing ID: SE141-103 Revision: 2
Links: 1-Type:W: 65707/1.0 Sub: 1 Op: 130
Customer P.O.: S005242-F/Ln:1
Serial No./Qty: C1

Reported By: KEVIN BOWLING
E-Mail: kBowling@MajorTool.com
Telephone: 317-636-6433
Fax: 317-634-9420

Problem: "T" HOLE NUMBERING WAS INCORRECTLY STAMPED ON THE PART. THE NUMBERING SCHEME WENT THE WRONG DIRECTION FROM THE STARTING POINT.

Proposed Disposition:
CUSTOMER RE-STAMPED THE PART WITH THE CORRECT HOLE NUMBERING SCHEME.

Number of additional pages:_____

Customer Disposition: [ ] Use As Is [ ] Rework [ ] Repair [ ] Scrap [ ] Replace

Technical Contact Approval:_____ **Title:**_____ **Date:**_____

Buyer Approval:_____ **Title:**_____ **Date:**_____

Major Tool Implemented By: _____ **Title:** QT. ENGINEER **Date:** 1/16/2006

Root Cause 1: 809-PROCESS INSTRUCTION
Resource: WHITE TEAM, ENGINEERING Equipment:
Description: SKETCH FROM CUSTOMER FOR HOLE NUMBERING SHOWED THE HOLE NUMBERING STARTING FROM THE CENTER OF THE LEADBLOCK OPENINGS AND PROGRESSING TOWARD THE POLOIDAL BREAK. THE SKETCH WAS MIS-READ AND THE HOLE NUMBERING WAS ACTUALLY PERFORMED IN THE WRONG DIRECTION.

Corr Actn: 1: Action: 11/09/05 By: 861-K.BOWLING
Description: CREATE AN MTM DRAWING DETAILING THE MARKING WITH MORE ILLUSTRATION TO ELIMINATE CONFUSION.

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 18830

Date: 12/09/05
User ID: GRIFFITH

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON — Telephone: 216-496-2314
E-Mail: NKHFlowen@aol.com — Fax: 216-328-2001

Part: ER316MNNF_093_GTAW / WELD WIRE,GTAW .093 DI — Customer P.O.: S005242-F/Ln:1
Drawing ID: — Revision: — Serial No./Qty: C1

Reported By: MIKE GRIFFITH — Telephone: 317-636-6433
E-Mail: mGriffith@MajorTool.com — Fax: 317-634-9420

Problem: NCSX-CSPEC-141-03-10 section 3.1.1.2 table 3-4 requires Elongation percentage to be a minimum of 32% at 77K. Actual test results for elongation are 27%.

Proposed Disposition:
Major Tool proposes that the elongation percentage be accepted as is and the specification be revised to include this elongation percentage.

Number of additional pages: _____

Customer Disposition: **X Use As Is** [ ] **Rework** [ ] **Repair** [ ] **Scrap** [ ] **Replace**

NCSX-CSPEC-141-03-10, Sect. 3.1.1.2, Table 3-4 was revised; the min. elongation at 77 K is now specified to be 25%. This is still adequate ductility.

Tech. Rep. Approval: Phil Heitzenroeder
Digitally signed by Phil Heitzenroeder
DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. Division
Reason: I agree to 'specified' portions of this document
Date: 2005.12.15 13:00:26 -05'00'

RLM Approval: Brad Nelson
Digitally signed by Brad Nelson
DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov
Date: 2005.12.15 17:01:45 -05'00'

Major Tool Implemented By: _____ **Title:** QA ENGINEER **Date:** 1/16/2006

Major Tool & Machine, Inc.
1458 East 19th Street
Indianapolis, IN 46218-4289

MTM N/C: 18831

Date: 12/09/05
User ID: GRIFFITH

Customer: ENERGY INDUSTRIES OF OHIO
Contact: NANCY HORTON — Telephone: 216-496-2314
E-Mail: NKHFlowen@aol.com — Fax: 216-328-2001

Part: ER316MNNF_093_GTAW / WELD WIRE,GTAW .093 DI — Customer P.O.: S005242-F/Ln:1
Drawing ID: — Revision: — Serial No./Qty: C1

Reported By: MIKE GRIFFITH — Telephone: 317-636-6433
E-Mail: mGriffith@MajorTool.com — Fax: 317-634-9420

Problem: Actual results for the room temperature Tensile Test were not supplied on the material test report.

Proposed Disposition:

Metrode has supplied conforming test results from a previously tested batch of weld wire. Major Tool is proposing that these results be used for acceptance as they are respresentative of the actual wire used by Major Tool.

Number of additional pages:_____

Customer Disposition: [X] Use As Is [ ] Rework [ ] Repair [ ] Scrap [ ] Replace

MTM has the chemistry certification for this batch. Since it is in conformance, the test results from the previously tested batch will be applicable to this batch.

NCSX will revise the spec with Rev. 11 to accept "typical" test results of weld wire that has certified chemistry.

Major Tool Implemented By: _____ **Title:** QFT ENGINEER **Date:** 1/2/06

Tech. Rep. Approval:

Phil Heitzenroeder
Digitally signed by Phil Heitzenroeder
DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. Division
Reason: I agree to 'specified' portions of this document
Date: 2006.01.09 17:07:36 -05'00'

RLM Approval:

Brad Nelson
Digitally signed by Brad Nelson
DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov
Date: 2006.01.10 15:55:50 -05'00'

EASTWOOD MANUFACTURING
CERTIFICATION OF COMPLIANCE

CUSTOMER : MAJOR TOOL AND MACHINE
ORDER # : P05-01160

DATE : 5-16-05
OUR NUMBER 32984

WE CERTIFY THAT THE MATERIALS SUPPLIED ON YOUR ORDER LISTED ABOVE COMPLIES WITH THE REQUIREMENTS OF YOUR ORDER AND OF THE SPECIFICATIONS LISTED BELOW

DESCRIPTION .

Lot No..		Part .		
32984-1	28 PIECES	DS141-036 ASTM A286 Silver plated Per AMS2410	Heat No.. 8969595	1 7/16 Round, machined to size Heat Treat. 36891 Silver plate. IMF 00132563 Post plate bake. SEI 37905 Tensile test. WH 05-0420-01

TENSILE KSI	YIELD KSI	ELONGATION	REDUCTION	HARDNESS
150	120	14	35	
PASS	PASS	PASS	PASS	PASS

DALE STARK
EASTWOOD MANUFACTURING

MAY 19 2005
96326
1-4
B-1

MTM 09 5/19/05

studs

mc108260.tif (1777x2240x2 tiff) [2]

Republic ENGINEERED PRODUCTS
401 ROSE AVE S E
MASSILLON, OH 44646 FAX 330-837-7017

CERTIFICATE OF TESTS REPUBLIC ENGINEERED PRODUCTS JANUARY 26, 2005
PAGE: 1 OF 3

PURCHASE ORDER: 42904-3 PURCHASE ORDER DATE: 05/24/04
PART NUMBER : S# 47670 ACCOUNT NUMBER . . : 27759001
ORDER NUMBER: 12-52585-06 821 SCHEDULE . . . . . : 58828-
HEAT . 8969595

CHARGE ADDRESS

FRY STEEL COMPANY
BUNNIE ISAKA
13325 MOLETTE ST
SANTA FE SPRINGS CA 90670

SHIP TO

FRY STEEL COMPANY
BUNNIE ISAKA
C/O CMI
4201 W 36TH ST
CHICAGO IL 60623

MATERIAL DESCRIPTION

COLD FINISHED STEEL BARS ALLOY DOUGLAS SPEC DMS-1555H GRADE B DTD 07/02/91 EXC MARK & PARA 3.4 OIL TEMP & 3.5 BORING SPEC BMS 7-28G ASTM A 331-95 ASTM A 108-03 LEVEL 1 MIL S 5000E COND E-4 EXC MARK AMS 6415R EXC BHN AMS 6409B AMS 2310E AMS 2301J AMS 2304A AMS 6484B AMS -S- 5000 ISS 3/99 COND E-4 EXC MARK & PARA 4.3 EF-AISI-E-4340 . AIRCRAFT Q DBL TRANSV MECH PROP COLD DRAWN NOR M & SUBCRITICAL ANN BEFORE CD REST CHEM

SIZE: RDS 1.4375 X 11 /13FT

LADLE CHEMISTRY

C	MN	P	S	SI	CU	NI	CR	MO	AL
0.42	00.75	.007	.002	0.22	0.10	01.70	00.84	0.21	00.028
V	N	CB	SN						
0.005	.0064	0.002	.007						

SEMI-FINISH RESULTS

AUSTENITIC GRAIN SIZE
AUST GRAIN SZ 7.

DEVELOPED TENS TRANS	ASTM E8	ASTM A370	
NORMALIZE	AUSTENITIZE	QUENCHANT	TEMPER 1
DEG F	DEG F		DEG F
1650.	1550.	OIL	900.

TEMP 1 TIME
HOURS
2.0

		TENSILE PSI	REDUCTION AREA PERCENT
PCE H	10102	185010.	45.5
PCE H	10302	180280.	55.6
PCE T	10503	185540.	55.7
PCE H	30102	180570.	53.4
PCE H	30302	193790.	53.0
PCE T	30504	185240.	46.3

DEVELOPED TRANS TENSILE	ASTM E8	ASTM A370	
NORMALIZE	AUSTENITIZE	QUENCHANT	TEMPER 1
DEG F	DEG F		DEG F
1650.	1500.	OIL	475.

TEMPER 2/SR	TEMP 1 TIME	TEMP 2 TIME
DEG F	HOURS	HOURS
475.	2.0	2.0

		TENSILE PSI	YIELD (.2%) PSI	REDUCTION AREA PERCENT	ELONGATION PERCENT
PCE H	10102	262320.	223800.	47.0	10.4
PCE H	10302	264250.	222910.	44.6	11.4
PCE T	10503	262170.	225100.	44.6	14.3
PCE H	30102	261840.	210860.	43.8	13.4
PCE H	30302	261260.	222160.	49.3	11.4
PCE T	30504	261050.	225230.	48.2	12.9

AMAN BHATIA
GEN MGR COLD FINISH OPERATIONS
Aman Bhatia

MTM 09 5/19/05

mc108260.tif (1752x2225x2 tiff) [3]

Republic ENGINEERED PRODUCTS
401 ROSE AVE S E
MASSILLON, OH 44646 FAX 330-837-7017

CERTIFICATE OF TESTS REPUBLIC ENGINEERED PRODUCTS JANUARY 26, 2005
PAGE: 2 OF 3

PURCHASE ORDER: 42904-3 PURCHASE ORDER DATE: 05/24/04
PART NUMBER : S# 47670 ACCOUNT NUMBER . . : 27759001
ORDER NUMBER: 12-52585-06 821 SCHEDULE . . . . . : 58828-
HEAT . . . . . : 8969595

SEMI-FINISH RESULTS (CONTINUED)

DEVELOPED TRANS TENSILE	ASTM E8	ASTM A370		
NORMALIZE	AUSTENITIZE	QUENCHANT	TEMPER 1	
DEG F	DEG F		DEG F	
1650.	1500.	OIL	475.	
TEMPER 2/SR	TEMP 1 TIME	TEMP 2 TIME		
DEG F	HOURS	HOURS		
475.	2.0	2.0		

	TENSILE PSI	YIELD (.2%) PSI	REDUCTION AREA PERCENT	ELONGATION PERCENT
PCE H 10102	256220.	218900.	35.8	9.7
PCE H 10302	260560.	223410.	46.3	10.6
PCE T 10503	254270.	220610.	14.6	7.6
PCE H 30102	263550.	222210.	35.4	11.0
PCE H 30202	261190.	223640.	46.8	12.3
PCE T 30504	258710.	221100.	44.3	11.8

JOMINY STD SAE J406 ASTM A255

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32
58	58	57	57	57	57	56	56	56	56	56	56	56	55	55	55	55	54	53	52	51	51	50	49	49

MACROETCH SRC ASTM E381 MIL STD 430
AVG SURFACE 1. RANDOM 1. CENTER 1.

MAG PARTICLE 2301 AMS 2301
AVG AVG FREQ 0.00 AVG SEV 0.00

MAG PARTICLE 2304 AMS 2304
AVG AVG FREQ 0.00 AVG SEV 0.00

FINISH SIZE RESULTS SCHEDULE: 58828

DECARBURIZATION	TOTAL DEPTH INCHES	SAE J419	ASTM E1077
PCE 01	.015		

HBW SURFACE (LAB)		ASTM E10	ASTM A370
PCE 01	HBW 217.		
PCE 02	HBW 217.		
PCE 03	HBW 217.		
PCE 04	HBW 217.		
PCE 05	HBW 223.		

MATERIAL SOURCES
RED. RATIO TO 1
73.6

TENSILE HT TRTD	NORMALIZE DEG F	ASTM E8	ASTM A370
PCE 01	1625.		

NOTES

THE MATERIAL WAS NOT EXPOSED TO MERCURY OR ANY METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURE DURING PROCESSING OR WHILE IN OUR POSSESSION.

CHEMICAL ANALYSIS CONFORMS TO APPLICABLE SPECS: ASTM E415, ASTM E1019, AND ASTM E1085.

AMAN BHATIA
GEN MGR COLD FINISH OPERATIONS

Aman Bhatia

MTM 09 5/19/05

58828

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Republic ENGINEERED PRODUCTS

401 ROSE AVE S E
MASSILLON, OH 44646 FAX 330-837-7017

CERTIFICATE OF TESTS REPUBLIC ENGINEERED PRODUCTS JANUARY 26, 2005
PAGE: 3 OF 3

PURCHASE ORDER: 42904-3 PURCHASE ORDER DATE: 05/24/04
PART NUMBER : S# 47670 ACCOUNT NUMBER . . : 27759001
ORDER NUMBER: 12-52585-06 821 SCHEDULE . . . . . : 58828-
HEAT . . . . : 8969595

NOTES (CONTINUED)

NO WELDING OR WELD REPAIR WAS PERFORMED ON THIS MATERIAL.

RECORDING OF FALSE, PICTITIOUS OR FRAUDULENT STATEMENT OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FED STATUES TITLE 18 CHAPTER 47.

I HEREBY CERTIFY THAT THE MATERIAL LISTED HEREIN HAS BEEN INSPECTED AND TESTED IN ACCORDANCE WITH THE METHODS PRESCRIBED IN THE GOVERNING SPECIFICATIONS AND BASED UPON THE RESULTS OF SUCH INSPECTION AND TESTING HAS BEEN APPROVED FOR CONFORMANCE TO THE SPECIFICATIONS.

CERTIFICATE OF TESTS SHALL NOT BE REPRODUCED EXCEPT IN FULL.

WHEN EVALUATED, MACRO ETCHES WERE VISUALLY RATED ON SAMPLES ETCHED USING HYDROCHLORIC ACID AT A TEMPERATURE 170 DEGREES(F) (+/- 10 DEGREES F)

ALL TESTING HAS BEEN PERFORMED USING THE CURRENT REVISION OF THE TESTING SPECIFICATIONS.

MFG IN THE U.S.A.

ALISON J. BLONDHEIM
NOTARY PUBLIC, STATE OF OHIO
MY COMMISSION EXPIRES MARCH 10, 2009

----- END OF DATA ----- CC ----- END OF DATA -----

FAX SHIP TO	1 COPY	ATTENTION BUNNIE ISAKA	562-802-7481	
MAIL SOLD TO	1 COPY	ATTENTION BUNNIE ISAKA		
FILE	1 COPY			
WITH SHIPMENT	1 COPY		SHIPPING AREA:	

32-984

FAY STEEL CO. CERTIFIES THAT THIS IS A TRUE COPY OF THE ORIGINAL MILL TEST REPORT NOW ON FILE.
RECEIVED AND INSPECTED
FEB 1 4 2005
BY: BUNNIE K ISAKA QC MANAGER

AMAN BHATIA
GEN MGR COLD FINISH OPERATIONS
Aman Bhatia

MTM 09 5/14/05

mc108260.tif (1756x2228x2 tiff) [5]

Tensile Test Report

Company: Eastwood Mfg. Date: 4/22/2005

Lab Report #: 05-0420-01

Attention: Dale Stark P.O. #: 32984

Identification: AISI 4340

Procedure: 1-3/8" O.D.

Process:

Filler: Heat#8969585

Qualification:

Welder:

32984

32984

TENSILE TEST

Lab ID	Dimensions	Area	Yield Lbs	Ultimate Load Lbs	Yield P.S.I.	Tensile P.S.I.
C	.504 round	.1995	31,880	34,700	159,700	174,000

Elongation	Reduction of Area	Fracture	Comments
18.2%	52.3%	Ductile	

Tests performed in accordance with ASTM A370, E8, and WH Laboratories, LLC Quality Assurance Manual.
.2% Offset Yield – Gage Length 2.000" for .500", and 1.400" for .350" tensile per ASTM A370.
Test specimens retained for one (1) week maximum; unused material is retained for one (1) month.

Approved by: Robert French
Robert French

MTM 09 5/19/05

SEI HEAT TREAT

PO BOX 16339 HOUSTON, TX 77222
PHONE (713) 699-3892 FAX (713) 694-0891

CUSTOMER: EASTWOOD MANUFACTURING	CERTIFICATION DATE: MAY 11, 2005
CERTIFICATION/SO NUMBER: 37905	CUSTOMER ORDER NUMBER: 32984

MATERIAL: 4340	NUMBER OF PIECES: 28
DESCRIPTION: 1-3/8" X 9" STUDS SLIVER PLATED	PART NUMBER(S): N/A
SPECIFICATION NUMBER: EASTWOOD MANUFACTURING	REFERENCE: N/A

HEAT TREAT PROCESS	TIME AT HEAT	COOLANT
BAKE 950°	45 min	AIR

32984

h31 x3

HARDNESS TEST:	NUMBER OF PIECES TESTED:

WE HEREBY CERTIFY THAT THE SERVICE FURNISHED ON THE ABOVE PURCHASE ORDER IS PROVIDED IN ACCORDANCE WITH OUR QUALITY CONTROL MANUAL, REVISION B, DATED JANUARY 21, 2001	QUALITY CONTROL: Lawi Flu

MTM 09 5/19/05

Eastwood Manufacturing
6825 Breen Rd.
Houston, Texas 77086
(281) 447-0081 fax (281) 447-0098

INSPECTION DATA
CHECK LIST
FOR
Major Tool & Machine Inc.

P.O. P05-01160

Part Number (Detail / Sub-Assy/ Assy)	Rev.	Page
DS141-036		1 1
Part Name (Detail) / Sub-Assy / Assy)		
Stud, 1.375-6 2A x 9 lg		
MATERIAL:	WORK ORDER # 32984	Quantity 126

P.O. – DRAWING – SPECIFICATION DESCRIPTION			INSPECTION INSTRUCTIONS			INSPECTION RESULTS	INSPECTED BY		
SHT	ZONE	CHARACTERISTIC	GAGE/EQUIP.	BY	SAMPLE	DATA, CAR NO., REMARKS	MFG	QA	DATE
		Length 9.00 $^{+.25}_{-.00}$	Caliper #201	ns	25	9.025 - 9.017		NS	5-5-05
		4.50	Caliper #200	ns	25	4.50		NS	5-5-05
		Pitch Dia. 1.2643 - 1.2562	Mic 1-2	ns	25	1.261 - 1.257		NS	5-505
		Body Dia. 1.375 $^{+0000}_{-.0002}$	#207 Mic 1-2	ns	25	1.3748 - 1.3749		NS	5-5-05
		Thread GO – NOGO	Gage #G017 #G017N	ns	25	ok		NS	5-5-05

COMMENTS: RECORD ALL DIMENSIONS THAT CARRIES A TOLERANCE OF (+-) .25mm OR LESS

MTM 09 5/19/05

INDUSTRIAL METAL FINISHING

CERTIFICATE OF COMPLIANCE

TO: EASTWOOD MFG. 5/86
P.O. BOX 41447
HOUSTON, TX 77241

THIS IS TO CERTIFY THAT THE METAL FINISHING SERVICE RENDERED ON ITEM(S)

126 EA. - 1.375 X 9 DP STUDS
252 EA. - 2.75 OD WASHERS
252 EA. - 1.375 12PT NUTS

ON PURCHASE ORDER 12984 LISTED ON OUR INVOICE #00132583

MEETS OR EXCEEDS THE REQUIREMENTS OF SPECIFICATION NUMBER

CERT: SILVER PLATE PER AMS 2410
NO BAKE REQUIRED

12984

QUALITY PROGRAM DATED: 05/01/93 REVISION: 1 DATED: 04/01/94

NAME: Tari McGlothlin

QC Manager 5/10/05
TITLE DATE

MTM 09 5/19/05

mc108258.TIF (1754x2223x2 tiff)

EASTWOOD MANUFACTURING
CERTIFICATION OF COMPLIANCE

CUSTOMER : MAJOR TOOL AND MACHINE
ORDER # : P05-0116[illegible]

DATE : 5-16-05
OUR NUMBER 32982

WE CERTIFY THAT THE MATERIALS SUPPLIED ON YOUR ORDER LISTED ABOVE COMPLIES WITH THE REQUIREMENTS OF YOUR ORDER AND OF THE SPECIFICATIONS LISTED BELOW

DESCRIPTION :

Lot No.:		Part :		
32982-1	56 PIECES	DS141-060 ASTM A286 Silver plated Per AMS2410	Heat No.: 8977349	1 5/8 Round, forged and machined to size Heat Treat: 36891 Silver plate: IMF 00132583 Post plate bake: none Tensile test: WH 05-0426-20

TENSILE KSI	YIELD KSI	ELONGATION	REDUCTION	HARDNESS
150	120	14	35	
PASS	PASS	PASS	PASS	PASS

DALE STARK
EASTWOOD MANUFACTURING

MAY 19 2005
96329
1-4
B.J

5/19/05

MTM 09

~~Washers~~ nuts

mc108258.TIF (1740x2209x2 tiff) [2]

Republic ENGINEERED PRODUCTS

GARY COLD FINISHED BAR PLANTS
PHONE: 219-886-8129 FAX: 219-886-8123

'CERTIFICATE OF TESTS' REPUBLIC ENGINEERED PRODUCTS SEPTEMBER 27, 2004
PAGE: 1 OF 2

PURCHASE ORDER: 4271475 PURCHASE ORDER DATE: 03/11/04
PART NUMBER . . : S# 51250 ACCOUNT NUMBER . . : 27759001
ORDER NUMBER . . : 12-51689-04 823 SCHEDULE . . . . . : 54199-
HEAT . . . . . : 8977349

CHARGE ADDRESS

FRY STEEL COMPANY
BUNNIE ISAKA
13325 MOLETTE ST
SANTA FE SPRINGS CA 90670

SHIP TO

FRY STEEL COMPANY
BUNNIE ISAKA
C/O CMI
4201 W 36TH ST
CHICAGO IL 60623

MATERIAL DESCRIPTION

COLD FINISHED STEEL BARS ALLOY ASTM A 331-95 ASTM A 108-03 LEVEL 2 MIL S 5626C & AMD 1 COND C-4 EXC MARK & PARA 4.3.1 & 4.12.1 WAIVED AMS 6382M AMS 2304A AMS 6349C EXC THERMAL TREATMENT AMS 2301J AMS - S - 5626 ISS 12/98 EXC PARA 4.3.1 & 4.12.1 EF-AISI-4140 AIRCRAFT Q TURNED & POLISHED ANN BEFORE TURN

SIZE: RDS 1.6250 X 11'/13FT

LADLE CHEMISTRY %

C	MN	P	S	SI	CU	NI	CR	MO	AL
0.42	00.90	.011	.020	0.24	0.18	00.16	00.97	0.21	00.027
V	N	CB	SN						
0.004	.0067	0.002	.009						

SEMI-FINISH RESULTS

AUSTENITIC GRAIN SIZE
AUST GRAIN SZ 7.

JOMINY STD SAE J406 ASTM A255

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32
58	57	57	56	56	56	55	55	53	52	50	48	47	45	44	43	40	39	38	38	38	37	38	37

MACROETCH SRC ASTM E381 MIL STD 430
AVG SURFACE 1. RANDOM 1. CENTER 1.

MAG PARTICLE 2301 AMS 2301
AVG AVG FREQ 0.00 AVG SEV 0.00

MAG PARTICLE 2304 AMS 2304
AVG AVG FREQ 0.00 AVG SEV 0.00

FINISH SIZE RESULTS SCHEDULE: 54199

BHN	HT TRTD (LAB)	ASTM E10	ASTM A370
PCE 01	SURFACE 187		
PCE 02	SURFACE 187		
PCE 03	SURFACE 187		
PCE 04	SURFACE 187		
PCE 05	SURFACE 187		

MATERIAL SOURCES
RED. RATIO
TO 1
58.2

NOTES

DECARB NIL

THE MATERIAL WAS NOT EXPOSED TO MERCURY OR ANY METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURE DURING PROCESSING OR WHILE IN OUR POSSESSION.

CHEMICAL ANALYSIS CONFORMS TO APPLICABLE SPECS:
ASTM E 327 ASTM E 1086 ASTM E 415 ASTM E 1019 ASTM E 1085 ASTM E572.

NO WELDING OR WELD REPAIR WAS PERFORMED ON THIS MATERIAL

5/19/05

AMAN BHATIA
GEN MGR COLD FINISH OPERATIONS

Aman Bhatia

HTM 09

mc108258.TIF (1664x2194x2 tiff) [3]

Republic ENGINEERED PRODUCTS

GARY COLD FINISHED BAR PLANTS
PHONE: 219-886-8129 FAX: 219-886-8123

CERTIFICATE OF TESTS REPUBLIC ENGINEERED PRODUCTS SEPTEMBER 27, 2004
PAGE: 2 OF 2

PURCHASE ORDER: 42714-5 PURCHASE ORDER DATE: 03/11/04
PART NUMBER . . : S# 51250 ACCOUNT NUMBER . . : 27759001
ORDER NUMBER: 12-51689-04 823 SCHEDULE . . . . . : 54199-
HEAT . . . . : 8977349

NOTES (CONTINUED)

I HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN INSPECTED AND TESTED IN ACCORDANCE WITH THE METHODS PRESCRIBED IN THE GOVERNING SPECIFICATIONS AND BASED UPON THE INSPECTION AND TESTING HAS BEEN APPROVED FOR CONFORMANCE TO THE SPECIFICATIONS

CERTIFICATE OF TESTS SHALL NOT BE REPRODUCED EXCEPT IN FULL.

ALL TESTING HAS BEEN PERFORMED USING THE CURRENT REVISION OF THE TESTING SPECIFICATION.

MFG IN THE U.S.A.

EVELYN GREENE
NOTARY PUBLIC, STATE OF INDIANA
MY COMMISSION EXPIRES OCTOBER 10, 2009

----- END OF DATA ----- CC ----- END OF DATA -----

FAX BY FAX PC 1 COPY ATTENTION BUNNIE ISAKA 562-802-7481
MAIL SOLD TO 1 COPY ATTENTION BUNNIE ISAKA
FILE 1 COPY
WITH SHIPMENT 1 COPY PRINTED AT SHIPPING AREA

REPUBLIC DO CERTIFIES THAT THIS IS A TRUE COPY OF THE ORIGINAL MILL TEST REPORT NOW ON FILE.
OCT 0 5 2004
By BUNNIE K. ISAKA - Q.C. MANAGER

AMAN BHATIA
GEN MGR COLD FINISH OPERATIONS
Aman Bhatia

5/19/05
MTM 09

Tensile Test Report

Company: Eastwood Mfg. Date: 4/27/2005

Lab Report #: 05-0426-20

Attention: Dale Stark P.O. #: 32982

Identification: AISI 4140

Procedure: 1-5/8" Diameter Bar

Process:

Filler:

Qualification:

Welder:

TENSILE TEST

Lab ID	Dimensions	Area	Yield Lbs	Ultimate Load Lbs	Yield P.S.I.	Tensile P.S.I.
E	.252 round	.0499	7,140	8,000	143,100	160,400

Elongation	Reduction of Area	Fracture	Comments
18.9%	61.2%	Ductile	

Tests performed in accordance with ASTM A370, E8, and WH Laboratories, LLC Quality Assurance Manual.
.2% Offset Yield – Gage Length 2.000" for .500", and 1.400" for .350" tensile per ASTM A370.
Test specimens retained for one (1) week maximum; unused material is retained for one (1) month.

Approved by: Robert French

5/19/05

MTM 09

Eastwood Manufacturing
9825 Breen Rd.
Houston, Texas 77086
(281) 447-0081 fax (281) 447-0098

INSPECTION DATA CHECK LIST FOR Major Tool & Machine Inc.

Part Number (Detail / Sub-Assy/ Assy)	Rev.	Page of
DS141-060		1 1

Part Name (Detail / Sub-Assy / Assy)

Nut, 12 pt 1.375-6 UNC-2B

MATERIAL:	WORK ORDER #	Quantity
	32982	252

P.O. # P05-01161

P.O. # / DRAWING - SPECIFICATION DESCRIPTION			INSPECTION INSTRUCTIONS			INSPECTION RESULTS	INSPECTED BY		
SHT	ZONE	CHARACTERISTIC	GAGE/EQUIP.	BY	SAMPLE	DATA, CAR NO., REMARKS	MFG	QA	DATE
		1.375 Maximum	Caliper #200	ns	25	1.375 - 1.370		NS	5-5-05
		2.216 Maximum	Caliper #200	ns	25	2.210 - 2.205		NS	5-5-05
		1.00	Caliper #200	ns	25	1.010 - 1.000		NS	5-5-05
		1.225 Minor Dia.1.195	Caliper #200	ns	25	1.210 - 1.205		NS	5-5-05
		Thread GO - NOGO	gage 243 244	ns	25	ok		NS	5-5-05
		Acorss Flat 1.62	Caliper #200	ns	25	1.62		Ns	5-5-05

COMMENTS: RECORD ALL DIMENSIONS THAT CARRIES A TOLERANCE OF (+-).25mm OR LESS

MIM 09 5/19/05

INDUSTRIAL METAL FINISHING

CERTIFICATE OF COMPLIANCE

TO: EASTWOOD MFG. 5/86
P.O. BOX 41447
HOUSTON, TX 77241

THIS IS TO CERTIFY THAT THE METAL FINISHING SERVICE RENDERED ON ITEM(S)

126 EA. - 1.375 X 9 DE STUDS
252 EA. - 2.75 OD WASHERS
252 EA. - 1.375 12PT NUTS

ON PURCHASE ORDER 12984 LISTED ON OUR INVOICE #00132583

MEETS OR EXCEEDS THE REQUIREMENTS OF SPECIFICATION NUMBER

CERT: SILVER PLATE PER AMS 2410
NO BAKE REQUIRED

QUALITY PROGRAM DATED: 05/01/93 REVISION: 1 DATED: 04/01/94

NAME:

QC Manager 5/10/05
TITLE DATE

12984

5/19/05
MTM 09

EASTWOOD MANUFACTURING
CERTIFICATION OF COMPLIANCE

CUSTOMER : MAJOR TOOL AND MACHINE DATE : 5-16-05
ORDER # : P05-01162 OUR NUMBER 32983

WE CERTIFY THAT THE MATERIALS SUPPLIED ON YOUR ORDER LISTED ABOVE COMPLIES WITH THE REQUIREMENTS OF YOUR ORDER AND OF THE SPECIFICATIONS LISTED BELOW

DESCRIPTION :

Lot No.:		Part :		
32983-1	56 PIECES	DS141-079 ASTM A286 Silver plated Per AMS2411	Heat No.: 8990135	2 3/4 Round, machined to size Heat Treat: 36891 Silver plate: IMF 00132583 Post plate bake: SEI 37904 Tensile test: WH 05-0420-01

TENSILE KSI	YIELD KSI	ELONGATION	REDUCTION	HARDNESS
150	120	14	35	
PASS	PASS	PASS	PASS	PASS

DALE STARK
EASTWOOD MANUFACTURING

RECEIVED
MAY 19 2005
96327
1-4
B.1

washers

5/19/05
MTM 09

mc108259.TIF (1620x2176x2 tiff) [2]

Republic ENGINEERED PRODUCTS
401 ROSE AVE S E
MASSILLON, OH 44646 FAX 330-837-7017

CERTIFICATE OF TESTS REPUBLIC ENGINEERED PRODUCTS FEBRUARY 14, 2005
PAGE: 1 OF 3

PURCHASE ORDER: 43004-8 PURCHASE ORDER DATE: 07/13/04
PART NUMBER : S# 48960 ACCOUNT NUMBER . . : 27759001
ORDER NUMBER: 12-52806-08 821 SCHEDULE . . . . . : 60703-
HEAT . . . . : 8990135

CHARGE ADDRESS

FRY STEEL COMPANY
BUNNIE ISAKA
13325 MOLETTE ST
SANTA FE SPRINGS CA 90670

SHIP TO

FRY STEEL COMPANY
BUNNIE ISAKA
C/O CMI
4201 W 36TH ST
CHICAGO IL 60623

MATERIAL DESCRIPTION

COLD FINISHED STEEL BARS ALLOY DOUGLAS SPEC DMS-1555H GRADE B DTD 07/02/91 EXC MARK & PARA 3.4 OIL TEMP & 3.5 BOEING SPEC BMS 7-280 LTV VOUGHT AERO SPEC CVA 1-585G & AMD 1 EXC RED/AREA ASTM A 331-95 ASTM A 108-03 LEVEL 1 MIL S 5000E COND E-3 EXC MARK AMS 6415R AMS 6409B AMS 2310E AMS 2301J AMS 2304A AMS 6484B AMS - S - 5000 ISSUE DTD 3/99 COND E3 EXC MARK EF-AISI-R-4340 . AIRCR AFT Q DBL TRANSV MECH PROP ROUGH TURNED NORM & SUBCRITICAL ANN BEFORE TURN S STRAIGHT REST CHEM FREE FROM DECARB

SIZE: RDS 2.7500/2.7734 X 11 /13FT

LADLE CHEMISTRY %

C	MN	P	S	SI	CU	NI	CR	MO	AL
0.42	00.73	.007	.004	0.26	0.15	01.74	00.86	0.20	00.034
V	N	CB	SN						
0.003	.0057	0.002	.010						

SEMI-FINISH RESULTS

AUSTENITIC GRAIN SIZE
AUST GRAIN SZ 7.

DEVELOPED TENS TRANS	NORMALIZE DEG F	ASTM E8 AUSTENITIZE DEG F	ASTM A370 QUENCHANT	TEMPER 1 DEG F
	1650.	1550.	OIL	900.

TEMP 1 TIME HOURS
2.0

		TENSILE PSI	REDUCTION AREA PERCENT
PCE H	20102	187750.	42.6
PCE H	20302	190780.	50.8
PCE T	20503	189630.	49.5
PCE H	40102	190530.	49.0
PCE H	40302	190020.	48.4
PCE T	40503	187050.	51.2

DEVELOPED TRANS TENSILE	NORMALIZE DEG F	ASTM E8 AUSTENITIZE DEG F	ASTM A370 QUENCHANT	TEMPER 1 DEG F
	1650.	1500.	OIL	475.

TEMPER 2/SR DEG F	TEMP 1 TIME HOURS	TEMP 2 TIME HOURS
475.	2.0	2.0

		TENSILE PSI	YIELD (.2%) PSI	REDUCTION AREA PERCENT	ELONGATION PERCENT
PCE H	20102	269150.	229500.	33.4	8.7
PCE H	20302	265160.	228430.	36.0	11.6
PCE T	20503	264570.	227270.	39.5	10.6
PCE H	40102	267580.	228000.	39.2	9.6
PCE H	40302	268390.	228870.	42.0	11.4
PCE T	40503	266130.	220000.	40.3	13.0

AMAN BHATIA
GEN MGR COLD FINISH OPERATIONS
Aman Bhatia

5/19/05
MTM 09

32984

mc108259.TIF (1612x2178x2 tiff) [3]

Republic ENGINEERED PRODUCTS
401 ROSE AVE S E
MASSILLON, OH 44646 FAX 330-837-7017

CERTIFICATE OF TESTS REPUBLIC ENGINEERED PRODUCTS FEBRUARY 14, 2005
PAGE: 2 OF 3

PURCHASE ORDER: 43004-8 PURCHASE ORDER DATE: 07/13/04
PART NUMBER : S# 48960 ACCOUNT NUMBER . . : 27759001
ORDER NUMBER: 12-52806-08 821 SCHEDULE . . . . . : 60703-
HEAT . . . . : 8990135

SEMI-FINISH RESULTS (CONTINUED)

DEVELOPED TRANS TENSILE ASTM E8 ASTM A370

	NORMALIZE DEG F	AUSTENITIZE DEG F	QUENCHANT	TEMPER 1 DEG F
	1650.	1500.	OIL	475.

	TEMPER 2/SR DEG F	TEMP 1 TIME HOURS	TEMP 2 TIME HOURS
	475.	2.0	2.0

	TENSILE PSI	YIELD (.2%) PSI	REDUCTION AREA PERCENT	ELONGATION PERCENT
PCE H 20102	263440.	226720.	23.3	9.3
PCE H 20302	262050.	225300.	10.9	6.3
PCE T 20503	263070.	223390.	37.1	10.0
PCE H 40102	261610.	225430.	10.9	3.0
PCE H 40302	260030.	225620.	33.3	10.6
PCE T 40503	262820.	230000.	36.0	11.5

JOMINY STD SAE J406 ASTM A255

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32
59	59	58	58	58	57	57	57	57	57	57	56	56	56	56	56	56	55	55	54	54	53	52	52

MACROETCH SRC ASTM E381 MIL STD 430
AVG SURFACE 1. RANDOM 1. CENTER 1.

MAG PARTICLE 2301 AMS 2301
AVG AVG FREQ 0.00 AVG SEV 0.00

MAG PARTICLE 2304 AMS 2304
AVG AVG FREQ 0.00 AVG SEV 0.00

FINISH SIZE RESULTS SCHEDULE: 60703

HBW HT TRTD (LAB)	ASTM E10	ASTM A370
PCE 01	SURFACE 197.	
PCE 02	SURFACE 192.	
PCE 03	SURFACE 192.	
PCE 04	SURFACE 192.	
PCE 05	SURFACE 197.	

MATERIAL SOURCES
RED. RATIO TO 1
20.9

TENSILE HT TRTD	NORMALIZE DEG F	ASTM E8	ASTM A370
PCE 01	1625.		

B2484

NOTES

DECARB NIL

THE MATERIAL WAS NOT EXPOSED TO MERCURY OR ANY METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURE DURING PROCESSING OR WHILE IN OUR POSSESSION.

CHEMICAL ANALYSIS CONFORMS TO APPLICABLE SPECS: ASTM E415, ASTM E1019, AND ASTM E1085.

NO WELDING OR WELD REPAIR WAS PERFORMED ON THIS MATERIAL.

RECORDING OF FALSE, FICTITIOUS OR FRAUDULENT STATEMENT OR ENTRIES ON THIS DOCUMENT MAY BE PUNISHED AS A FELONY UNDER FED STATUES TITLE 18 CHAPTER 47.

5/19/05

AMAN BHATIA
GEN MGR COLD FINISH OPERATIONS
Aman Bhatia

MTM 09

mc108259.TIF (1620x2176x2 tiff) [4]

Republic ENGINEERED PRODUCTS
401 ROSE AVE S E
MASSILLON, OH 44646 FAX 330-837-7017

CERTIFICATE OF TESTS REPUBLIC ENGINEERED PRODUCTS FEBRUARY 14, 2005
PAGE: 3 OF 3

PURCHASE ORDER: 43004-8 PURCHASE ORDER DATE: 07/13/04
PART NUMBER : S# 48960 ACCOUNT NUMBER . . : 27759001
ORDER NUMBER: 12-52806-08 821 SCHEDULE . . . . . : 60703-
HEAT . . . . . : 8990135

NOTES (CONTINUED)

I HEREBY CERTIFY THAT THE MATERIAL LISTED HEREIN HAS BEEN INSPECTED AND TESTED IN ACCORDANCE WITH THE METHODS PRESCRIBED IN THE GOVERNING SPECIFICATIONS AND BASED UPON THE RESULTS OF SUCH INSPECTION AND TESTING HAS BEEN APPROVED FOR CONFORMANCE TO THE SPECIFICATIONS.

CERTIFICATE OF TESTS SHALL NOT BE REPRODUCED EXCEPT IN FULL.

WHEN EVALUATED, MACRO ETCHES WERE VISUALLY RATED ON SAMPLES ETCHED USING HYDROCHLORIC ACID AT A TEMPERATURE 170 DEGREES(F) (+/- 10 DEGREES F)

ALL TESTING HAS BEEN PERFORMED USING THE CURRENT REVISION OF THE TESTING SPECIFICATIONS.

MFG IN THE U.S.A.

ALISON J. BLONDHEIM
NOTARY PUBLIC, STATE OF OHIO
MY COMMISSION EXPIRES MARCH 10, 2009

----- END OF DATA ----- CC ----- END OF DATA -----

FAX SHIP TO 1 COPY ATTENTION BUNNIE ISAKA 562-802-7481
MAIL SOLD TO 1 COPY ATTENTION BUNNIE ISAKA
FILE 1 COPY
WITH SHIPMENT 1 COPY SHIPPING AREA:

32484

FRY STEEL CO. CERTIFIES THAT THIS IS A TRUE COPY OF THE ORIGINAL MILL TEST REPORT NOW ON FILE.
RECEIVED AND INSPECTED

FEB 2 1 2005

BY Bunnie Isaka

AMAN BHATIA
GEN MGR COLD FINISH OPERATIONS

Aman Bhatia

MTM 09

Tensile Test Report

Company: Eastwood Mfg. Date: 4/22/2005

Lab Report #: 05-0420-01

Attention: Dale Stark P.O. #: 32984

Identification: AISI 4340

Procedure: 2-3/4" O.D. Washer

Process:

Filler: Heat#8990135

Qualification:

Welder:

TENSILE TEST

Lab ID	Dimensions	Area	Yield Lbs	Ultimate Load Lbs	Yield P.S.I.	Tensile P.S.I.
C	.245 round	.0471	7,660	8,770	166,700	186,000

Elongation	Reduction of Area	Fracture	Comments
14.0%	41.7%	Ductile	Transverse

Tests performed in accordance with ASTM A370, E8, and WH Laboratories, LLC Quality Assurance Manual.
.2% Offset Yield – Gage Length 2.000" for .500", and 1.400" for .350" tensile per ASTM A370.
Test specimens retained for one (1) week maximum; unused material is retained for one (1) month.

Approved by: Robert French
Robert French

5/19/05

ASTM 09

32984

32984

SEI HEAT TREAT

PO BOX 16339 HOUSTON, TX 77222

PHONE (713) 699-3892 FAX (713) 694-0891

CUSTOMER: EASTWOOD MANUFACTURING	CERTIFICATION DATE: MAY 11, 2005
CERTIFICATION/SO NUMBER: 37904	CUSTOMER ORDER NUMBER: 32983

MATERIAL: 4340	NUMBER OF PIECES: 52
DESCRIPTION: 2-3/4" WASHERS SILVER PLATED	PART NUMBER(S): N/A
SPECIFICATION NUMBER: EASTWOOD MANUFACTURING	REFERENCE: N/A

HEAT TREAT PROCESS	TIME AT HEAT	COOLANT
Bake 900°	45 min	Air

HARDNESS TEST:	NUMBER OF PIECES TESTED:

WE HEREBY CERTIFY THAT THE SERVICE FURNISHED ON THE ABOVE PURCHASE ORDER IS PROVIDED IN ACCORDANCE WITH OUR QUALITY CONTROL MANUAL, REVISION B, DATED JANUARY 21, 2001	QUALITY CONTROL:

5/19/05

MTM 09

Eastwood Manufacturing
6825 Breen Rd.
Houston, Texas 77086
(281) 447-0081 fax (281) 447-0098

P.O. P05-01162

INSPECTION DATA CHECK LIST FOR
Major Tool & Machine Inc.

Part Number (Detail / Sub-Assy/ Assy)	Rev.	Page of
DS141-079		1 1
Part Name (Detail / Sub-Assy / Assy)		
Flat Washer		
MATERIAL:	WORK ORDER # 32983	Quantity 252

P.O. – DRAWING – SPECIFICATION DESCRIPTION			INSPECTION INSTRUCTIONS			INSPECTION RESULTS	INSPECTED BY		
SHT	ZONE	CHARACTERISTIC	GAGE/EQUIP.	BY	SAMPLE	DATA, CAR NO., REMARKS	MFG	QA	DATE
		O.D. 2.75 ±.05	Caliper #200	ns	25	2.745 - 2.740		NS	5-5-05
		I.D. 1.66 ±.010	Caliper #200	ns	25	1.660 - 1.655		NS	5-5-05
		TK .500 ±.010	Caliper #200	ns	25	.505 - .498		NS	5-5-05

COMMENTS: RECORD ALL DIMENSIONS THAT CARRIES A TOLERANCE OF (+-) .25mm OR LESS

MTM QC 5/19/05

SEI HEAT TREAT

PO BOX 16339 HOUSTON, TX 77222

PHONE (713) 699-3892 FAX (713) 694-0891

CUSTOMER: EASTWOOD MANUFACTURING	**CERTIFICATION DATE:** APRIL 13, 2005
CERTIFICATION/SO NUMBER: 36891	**CUSTOMER ORDER NUMBER:** 32984

MATERIAL: 4340	**NUMBER OF PIECES:** 378
DESCRIPTION: 126 PCS. 1-3/8" X 9" DE STUDS 252 PCS. 2.75" WASHERS	**PART NUMBER(S):** N/A
SPECIFICATION NUMBER: EASTWOOD MANUFACTURING	**REFERENCE:** N/A

HEAT TREAT PROCESS		TIME AT HEAT	COOLANT
Harden	1575°	3 hr	Oil Q
Temper	980°	4 hr	Air

HARDNESS TEST: 37-38 R	**NUMBER OF PIECES TESTED:** 10

WE HEREBY CERTIFY THAT THE SERVICE FURNISHED ON THE ABOVE PURCHASE ORDER IS PROVIDED IN ACCORDANCE WITH OUR QUALITY CONTROL MANUAL, REVISION B, DATED JANUARY 21, 2001	**QUALITY CONTROL:** Louis Flo

INDUSTRIAL METAL FINISHING

CERTIFICATE OF COMPLIANCE

TO: EASTWOOD MFG. 5/86
P.O. BOX 41447
HOUSTON, TX 77241

THIS IS TO CERTIFY THAT THE METAL FINISHING SERVICE RENDERED ON ITEM(S)

126 EA. - 1.375 X 9 DE STUDS
252 EA. - 2.75 OD WASHERS
252 EA. - 1.375 12PT NUTS

ON PURCHASE ORDER 12984 LISTED ON OUR INVOICE #00132583

MEETS OR EXCEEDS THE REQUIREMENTS OF SPECIFICATION NUMBER

CERT: SILVER PLATE PER AMS 2410
NO BAKE REQUIRED

QUALITY PROGRAM DATED: 05/01/93 REVISION: 1 DATED: 04/01/94

Tari McGlothlin
NAME:

QC Manager 5/10/05
TITLE DATE

12984

5/19/05

03/04/05 13:38 FAX 630 834 8427
MAJOR TOOL & MACHINE INC
1458 E 19TH ST
INDIANAPOLIS IN 46218

MCMASTER CARR SUPPLY #3

YOUR PURCHASE ORDER NUMBER
P05-01260

Today's Date:

002

MCMASTER-CARR
600 COUNTY LINE ROAD
ELMHURST IL 60126-2961

IF THERE ARE ANY QUESTIONS ABOUT THIS SHIPMENT CONTACT OUR SALES DEPARTMENT
(630)833-0300

PAGE 1

MCM NUMBER 61468181-01

EXTRA PACKING LIST

Warehouse Location	McMaster-Carr Part Number	Fill Quantity	Item Description	Your Line	Your Order	This Shipment
	7476S A86	1 EA	LOCTITE PRISM SUPER GLUE HZ-M TOUGHENED,NUMBER 411,1-POUND BOTTLE,CLEAR 1	1	1 EA	1
	7476S A86	1 EA	LOCTITE PRISM SUPER GLUE HZ-M TOUGHENED,NUMBER 411,1-POUND BOTTLE,CLEAR 1	2	1 EA	1
		*****	Information about the rest of your order		*****	
	7476S A86		LOCTITE PRISM SUPER GLUE Balance of 1 EA expected to ship by 3/7/2005	3	1 EA	
	7476S A86		LOCTITE PRISM SUPER GLUE Balance of 1 EA expected to ship by 3/7/2005	4	1 EA	
	7476S A86		LOCTITE PRISM SUPER GLUE Balance of 1 EA expected to ship by 3/7/2005	5	1 EA	
	7476S A86		LOCTITE PRISM SUPER GLUE Balance of 1 EA expected to ship by 3/7/2005	6	1 EA	

REFER TO: 61468181-01

MAJOR TOOL & MACHINE INC

Certificate of Compliance

This is to certify that according to our records, the material furnished on this purchase order was supplied in compliance to the description listed, and as illustrated in our catalog.

Quality Control

TAG CCP

LNS: 2

FACE | NUMBER OF LETTERS

CYCLE

MCM NO. 61468181-01 04

PURCHASE ORDER
P05-01260

MAR - 4 2005

FROM:
MCMASTER-CARR
600 COUNTY LINE ROAD
ELMHURST IL 60126-2961 USA

SHIP TO:
MAJOR TOOL & MACHINE INC
1458 E 19TH ST
INDIANAPOLIS IN 46218

T3CEO

CCP

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mc108545.tif (1628x2145x2 tiff)

Spaulding COMPOSITES
55 Nadeau Drive
Rochester, NH 03867
Ph: (603) 332-0555 Fax: (603) 332-5357
www.spauldingcom.com

Shipping List 072435
Customer No 101193
Sales Order Shipper

Sold to : STANDARD GRINDING & MFG CO
3721 W. CHASE AVENUE
SKOKIE, IL 60076
United States

Ship to : STANDARD GRINDING & MFG CO
3721 W. CHASE AVENUE
SKOKIE, IL 60076
United States

Ship Date	Customer PO	Sales Order	# of Boxes	Weight	Ship VIA	Bill of Lading	FOB
05/17/2005	60824	085171-00	1	0	YELLOW	072435	DE

Item	Part / Description / Details	Order Quantity	Ship Qty
000001	39G1CNT73125NMWLF U/M SHT SO Item 4 G-11-CR 48" +untrimmed X 36"+untrimmed Thickness: 3.125" +/-.110" PLEASE NOTE THAT THERE IS NO NEMA STANDARD FOR G-11 CR SHEET SPAULDING C OF C TO G-11 CR SHEET NO TESTING REQUIRED AT TIME OF ORDER Sheet Lead 3.550 TK	1.00000	1.00000

RECEIVED
MAY 19 2005
By

MAY 31 2005
96507
Lucs
1,2
B.J.
MTM 09
5/31/05

CERTIFICATE of CONFORMANCE

WE HEREBY CERTIFY THAT THE MATERIAL SUPPLIED ON THIS ORDER WAS MADE IN ACCORDANCE WITH THE STANDARDS AND PROCESSES ESTABLISHED BY SPAULDING COMPOSITES COMPANY FOR THE REQUIREMENTS OF MATERIAL DESCIBED ABOVE.

LOT # DOM.

Authorized By: Mark F Candillo Date: 05/17/2005

Customer Copy

Form: SCSHIP Rev: 8/99

Spaulding COMPOSITES
55 Nadeau Drive
Rochester, NH 03867
Ph: (603) 332-0555 Fax: (603) 332-5357
www.spauldingcom.com

Shipping List 072434
Customer No 101193
Sales Order Shipper

Sold to : STANDARD GRINDING & MFG CO
3721 W. CHASE AVENUE
SKOKIE, IL 60076
United States

Ship to : STANDARD GRINDING & MFG CO
3721 W. CHASE AVENUE
SKOKIE, IL 60076
United States

Ship Date	Customer PO	Sales Order	# of Boxes	Weight	Ship VIA	Bill of Lading	F O B
05/17/2005	60624	065169-00	1	716	YELLOW	072434	DE

Item	Part / Description / Details	Order Quantity	Ship Qty
000001	39G1CNT71850NMWLF U/M SHT SO Item 5 G-11-CR 48" +UNTRIMMED X 36"+UNTRIMMED THK: 1.850" +/-.070" PLEASE NOTE THAT THERE IS NO NEMA STANDARD FOR G-11 CR SHEET SPAULDING C OF C TO G-11 CR SHEET NO TESTING REQUIRED AT TIME OF ORDER	1.00000	1.00000

RECEIVED
MAY 19 2005
By

5/31/05
MTM 09

CERTIFICATE of CONFORMANCE

WE HEREBY CERTIFY THAT THE MATERIAL SUPPLIED ON THIS ORDER WAS MADE IN ACCORDANCE WITH THE STANDARDS AND PROCESSES ESTABLISHED BY SPAULDING COMPOSITES COMPANY FOR THE REQUIREMENTS OF MATERIAL DESCIBED ABOVE.

LOT # DOM.

Authorized By: Mark F Cardillo Date: 05/17/2005

Customer Copy

Form: SCSHIP Rev: 8/99

METRODE PRODUCTS LIMITED
HANWORTH LANE, CHERTSEY
SURREY, UK, KT16 9LL
Tel: +44 (0) 1932 566721
Fax: +44 (0) 1932 565188
Email: info@metrode.com
Website: www.metrode.com

CERTIFIED MATERIAL TEST REPORT

THIS PRODUCT HAS BEEN MANUFACTURED AND SUPPLIED THROUGH A SYSTEM APPROVED TO ISO 9001 & 2 OR EQUIVALENT

TEST CERTIFICATE NUMBER

193695

INVOICE TO
EUROWELD LTD
255 ROLLING HILLS ROAD
MOORESVILLE
NC 28117
USA

DESPATCHED TO
EUROWELD LTD
255 ROLLING HILLS ROAD
MOORESVILLE
NC 28117
USA

CUSTOMER ORDER NUMBER	N.05-34
DELIVERY NOTE DOCUMENT NUMBER	DN0105859
QUANTITY (KG)	15.0000
OUR ORDER REFERENCE	SO1787730 / 1
DATE	02/03/05

METRODE WELDING CONSUMABLE	ER316MNNF TIG 2.4mm
FORM	TIG WIRE
BATCH NUMBER	WO20132
SPECIFICATION	BS EN 12072:2000 W 20 16 3 Mn L

Chemical Analysis (Weight %)									Type: BS EN 10204: 3.1.B / ASME SFA-5.01: Sch. H		
C	Mn	Si	S	P	Cr	Ni	Mo	N	Cu		
0.015	7.43	0.42	0.006	0.014	19.9	15.4	2.62	0.14	0.20		

Mechanical Tests						Type: BS EN 10204: 2.2 / ASME SFA-5.01: Sch. G		
Tensile Tests						Impact Energies		
Condition	Test Temperature	$Rp_{0.2\%}$ (MPa)	Rm (MPa)	A4 (%)	Z (%)	Temperature (°C)	Impact Energy (J)	Lateral Expansion (mm)
AS-WELDED	ROOM	>400	>600	40	-	-196	70	-

Metrode Products Limited certifies that the above material conforms to the indicated specifications

This document is produced electronically and is valid without signature.

IMPORTANT Any liability arising from either reliance on this certificate, or use of our products, is strictly limited and governed by our conditions of business

Barrie Kyle – Q.A.Manager

ASME SFA-5.01; Lot classification S4

3/3/05
93911
Linc 1 B.1

Notes:
% Ni includes incidental Co unless otherwise specified.
% Nb (Cb) includes incidental Ta unless otherwise specified
Ferrite is given as FN (Ferrite Number) and measured on all-weld pad using instrument calibrated against ANSI/AWS-related secondary standards (See AWS A4.2-97) unless otherwise specified

MAR 09
3/7/05

Westmoreland Mechanical Testing & Research, Inc.
P.O. Box 388
Westmoreland Drive
Youngstown, Pa. 15696-0388 U.S.A.
Telephone: 724-537-3131 Fax: 724-537-3151
Website: www.wmtr.com
WMT&R is a technical leader in the material testing industry.

ACCREDITED
621-01 & 621-02

Accredited Nadcap Materials Testing Laboratory

April 22, 2005

CERTIFICATION

Page IM1 of 1

WMT&R Report No. 5-25008
P.O. No. P05-01764
PQR No. 434
Welder Jason Bever #465

Major Tool & Machine Inc.
1458 East 19th Street
Indianapolis, IN 46218

Corrected Date
May 4, 2005

Attention: Josh Mayne

Subject: All processes, performed upon the material as received, were conducted at WMT&R, Inc. in accordance with the WMT&R Quality Assurance Manual, Rev. 9, dated 4/1/2000.
The following tests were performed on this order: IMPACT and TENSILE

IMPACT RESULTS: ASME Section IX and AWS B2.1, ASTM E23-02
No Requirements
MATERIAL: Metaltek CF8MNMN MOD
SAMPLE TYPE: Charpy V-Notch **DISPOSITION: Report**

Specimen ID	TestLog Number	Sample Size	Temp. °F\°C	Energy ft-lbs	Energy joules	Mils Lat Exp	A\U\R
Weld-1	B65835	Standard	68\20	173	234.6	84	Report
Weld-2	B65836	Standard	68\20	160	216.9	68	Report
Weld-3	B65837	Standard	68\20	157	212.9	81	Report

A\U\R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

Richard G. Parks
Project Manager/Industrial Technology Engineer

5/4/05
May 4, 2005

Westmoreland Mechanical Testing & Research, Inc.
P.O. Box 388
Westmoreland Drive
Youngstown, Pa. 15696-0388 U.S.A.
Telephone: 724-537-3131 Fax: 724-537-3151
Website: www.wmtr.com
WMT&R is a technical leader in the material testing industry.

ACCREDITED
821-01 & 821-02

Accredited Nadcap Materials Testing Laboratory

April 20, 2005

CERTIFICATION

WMT&R Report No. 5-25008
P.O. No. P05-01764
PQR No. 434
Welder Jason Bever #465

Major Tool & Machine Inc.
1458 East 19th Street
Indianapolis, IN 46218

Attention: Josh Mayne

Subject: All processes, performed upon the material as received, were conducted at WMT&R, Inc. in accordance with the WMT&R Quality Assurance Manual, Rev. 9, dated 4/1/2000.
The following tests were performed on this order: IMPACT and TENSILE

TENSILE RESULTS: ASME Section IX and AWS B2.1, ASTM E21-03a
SOAK TIME: 5 Minutes
SPEED OF TESTING: 0.0050 in./in./min., 0.0500 in./min./in.
MATERIAL: Metrode ER316Mnnf **DISPOSITION: Report**

Specimen ID	TestLog Number	Temp. °F/°C	UTS KSI/MPA	0.2% YS KSI/MPA	Elong %	RA %	Modulus MSI/GPA	Ult. Load LBS/NEWTONS	0.2% YLD. LBS/NEWTONS
T1	B65833	-320/-196	191.8/1320	148.7/1030	27	39	28.7/198	2630/11699	2039/9071

A/U/R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

DISPOSITION: Report

Specimen ID	TestLog Number	Orig. Width (in./mm)	Final Width (in./mm)	Orig. Thick (in./mm)	Final Thick (in./mm)	Orig. Dia. (in./mm)	4D Orig GL (in./mm)	4D Final GL (in./mm)	Orig. Area (Sq. In./Sq. mm)	Failure Location/Type	Machine Number	A/U/R
T1	B65833	0.1802/4.57708	0.1437/3.650	0.0761/1.933	0.0582/1.478	0.2511/6.378	0.70/17.78	0.89/22.61	0.04183816/26.992307	WELD/DUCTILE	M9	R

A/U/R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

Roy E. Starr/Matt Wojton
____ Technical Services Manager/____ Tensile Supervisor April 20, 2005

Westmoreland Mechanical Testing & Research, Inc.
P.O. Box 388
Westmoreland Drive
Youngstown, Pa. 15696-0388 U.S.A.
Telephone: 724-537-3131 Fax: 724-537-3151
Website: www.wmtr.com
WMT&R is a technical leader in the material testing industry.

ACCREDITED
821-01 & 821-02

Accredited Nadcap Materials Testing Laboratory

April 20, 2005

CERTIFICATION

Section 2 of 2

WMT&R Report No. 5-25008
P.O. No. P05-01764

Major Tool & Machine Inc.

TENSILE RESULTS: ASME Section IX and AWS B2.1, ASTM E21-03a

SOAK TIME: 5 Minutes

SPEED OF TESTING: 0.0050 in./in./min., 0.0500 in./min./in.

MATERIAL: Metrode ER316Mnnf **DISPOSITION: Report**

Specimen ID	TestLog Number	Temp. °F/°C	UTS KSI/MPA	0.2% YS KSI/MPA	Elong %	RA %	Modulus MSI/GPA	Ult. Load LBS/NEWTONS	0.2% YLD. LBS/NEWTONS
T2	B65834	-320/-196	204.7/1410	156.5/1080	29	34	29.9/206	5095/22664	3894/17323

A/U/R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

DISPOSITION: Report

Specimen ID	TestLog Number	Orig. Dia. (in./mm)	Final Dia. (in./mm)	4D Orig GL (in./mm)	4D Final GL (in./mm)	Orig. Area (Sq. In./Sq. mm)	Failure Location/Type	Machine Number	A/U/R
T2	B65834	0.1780/4.521	0.1444/3.668	0.70/17.78	0.90/22.86	0.02488456/16.054520	WELD/DUCTILE	M9	R

A/U/R: A=ACCEPTABLE, U=UNACCEPTABLE, R=REPORT

Roy E. Starr/Matt Wojton
Technical Services Manager/Tensile Supervisor

4/20/05
April 20, 2005

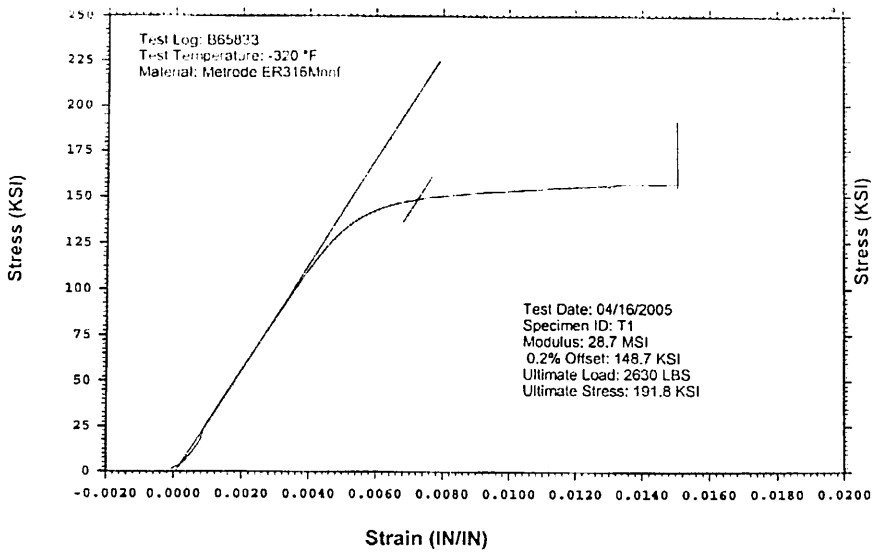
WESTMORELAND MECHANICAL TESTING & RESEARCH, Inc

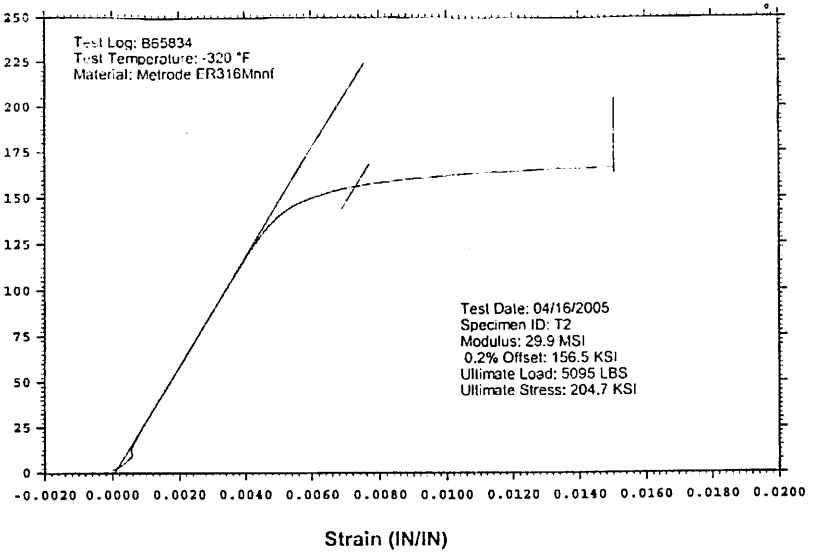
Stress vs. Strain

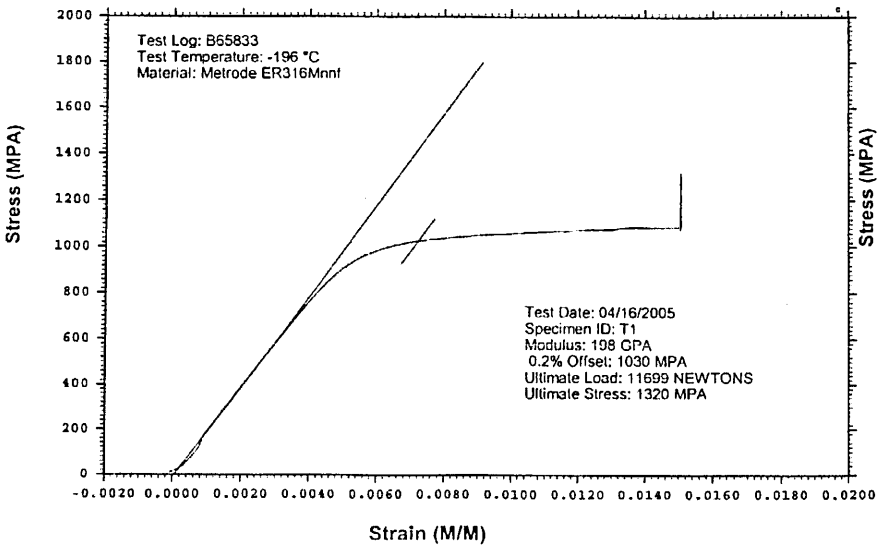
Phone: (724)537-3131

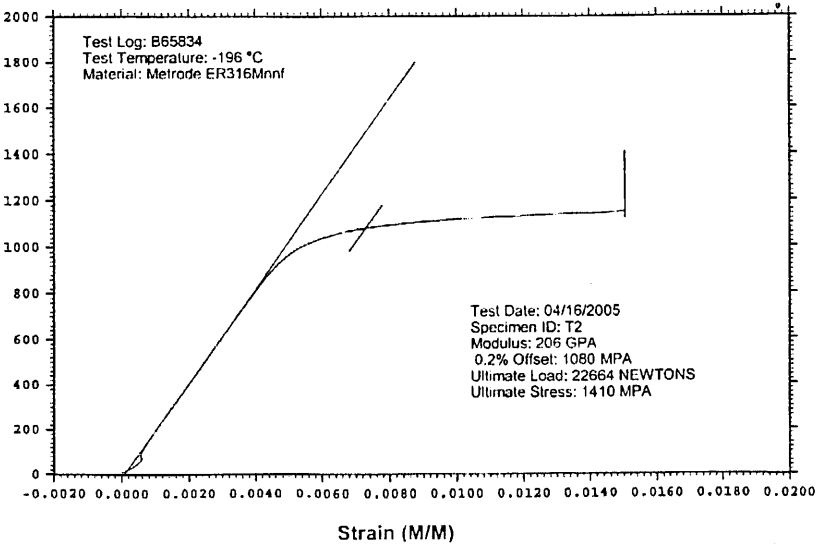
Customer: Major Tool & Machine Inc.
WMT&R Report: 5-25008

P.O. No.: P05-01764
PQR No.: 434
Welder: Jason Bever #465









METRODE PRODUCTS LTD
HANWORTH LANE
CHERTSEY SURREY
ENGLAND KT16 9LL
Tel: +44 (0)1932 566721
Fax: +44 (0)1932 565168
Email: info@metrode.com
Internet: http//www.metrode.com

TEST CERTIFICATE

THIS PRODUCT HAS BEEN MANUFACTURED AND SUPPLIED THROUGH A SYSTEM APPROVED TO ISO 9001 & 2 OR EQUIVALENT

TEST CERTIFICATE NUMBER 194277

METRODE WELDING CONSUMABLES

BATCH No.	~~W020132~~
OUR ORDER REF.	~~S01708013 / 1~~
DATE	~~09/03/05~~
PRODUCT	~~ER316MNNF TIG 2.4MM~~
FORM	~~TIG WIRE~~
SPECIFICATION	BS EN 12072:2000 W 20 16 3 Mn L

INVOICE TO	DESPATCHED TO:
EUROWELD LTD 255 ROLLING HILLS ROAD MOORESVILLE NC 28117 USA	EUROWELD LTD 255 ROLLING HILLS ROAD MOORESVILLE NC 28117 USA

IMPORTANT: Any liability arising from either reliance on this certificate, or use of our products, is strictly limited and governed by our conditions of business.

CUSTOMER ORDER No.	DELIVERY NOTE DOCUMENT No.	QUANTITY (Kg)
N. 05-39	DN0106163	17.5000

CHEMICAL ANALYSIS (WEIGHT %) TYPE CERTIFIED MATERIAL TEST REPORT: BS EN 10204: 3.1.B

C	Mn	Si	S	P	Cr	Ni	Mo	N	Cu			
0.015	7.43	0.42	0.006	0.014	19.9	15.4	2.62	0.14	0.20			

TYPICAL ALL-WELD METAL MECH. PROPERTIES, AS WELDED:-
TS: >600 N/mm2; 0.2%PS: >400 N/mm2; EL. ON 4D: 40 %;
CVN @ -196 DEG.C: 70 J.

3/23/05
44534

3/23/05
MTM 09

Line 1
B-2

Metrode Products Ltd. certifies that the above material conforms to the indicated specifications

B. KYIET
Q.A MANAGER

NOTES: *Mn includes incidental Co unless otherwise specified
*Nb (Cb) includes incidental Ta unless otherwise specified.
Ferrite is given as FN (Ferrite Number) and measured on all-weld pad using instrument calibrated against NBS quoted secondary standards (See AWS A4.2-97) unless otherwise specified.

All Test certificates issued by METRODE will contain this embossed seal.
Any recipient of a copy of METRODE Test Certificate without the seal should ensure from the supplier that it is a true and accurate reproduction of the original

mc107081.tif (1668x2198x2 tiff)

GE Advanced Materials, Polymershapes

Certificate of Conformance

Date:

Attn: Receiving Inspection
To: Major Tool + Machine
Address: 1458 E. 19th St.
Indianapolis, IN 46218

Customer P.O. Number: P05-01288
Sales Order No: 2790837

It is hereby certified that the product information provided below conforms to the corresponding information in the possession of GE Advanced Materials, Polymershapes with respect to such products. This certification and the sale of products are subject to GE Advanced Materials, Polymershapes' standard conditions of sale. This document shall not be reproduced, except in full, without prior written approval.

Quantity	Description	Lot/Specification/Standard Number
36	GLICK Plendia sheet .062"THK X 16"X 35"	No Spec / N38.009023

MTH 09
4/5/05

APR - 5 2005
94942
1-18

GE Advanced Materials, Polymershapes

By: Ernest Evans

Title: Warehouse Worker

INSPECTION DATA CHECKLIST

Quality Assurance Documentation for Part ID: SE141-116 - Item: 23

Workorder: 65707/1-0 Sub:1 Op:90

Part: SE141-116 - MODULAR COIL WINDING FORM TYPE-C - PRODUCTION MODULAR COIL WINDING FORM TYPE-C

Drawing ID: SE141-116 Rev: 6			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
* (10)		RECORD RANGE UPPER AND LOWER LIMITS OF MAG PERMEABILITY READI (Mu) FOR THE AS CAST SURFACES	MASTER GAGE	QA		J-1270	LESS THAN 1.01 (LESS THAN RANGE OF GE)	212-J.LE 09-20-05			A
* (20)		RECORD RANGE UPPER AND LOWER LIMITS OF MAG PERMEABILITY READI (Mu) FOR THE MACHINED SURFACES	MASTER GAGE	QA		J-1270	LESS THAN 1.01 (LESS THAN RANGE OF GE)	212-J.LE 09-20-05			A

Nondestructive Test
Certification for Liquid Penetrant Examination

1458 E. 19th Street, Indianapolis, In 46218
TEL:(317)636-6433 FAX:(317)634-9420

Quality Assurance Documentation for Part ID: SE141-116 - Item: 25

Date of Inspection: 09/20/2005 **Type of Material:** CAST STAINLESS **NDT#:** 13726

Stage of Inspection:	Manufacturing Process:	Surface Condition:	Test Being Run to:	Heat Treated:
[ ] Incoming Inspection	[ ] Weldment [x] Casting	[x] Machined	[x] Router Instructions	[x] Yes
[ ] In-Process Inspection	[ ] Bar Stock [ ] Plate	[ ] Rough	[x] Drawing	[ ] No
[ ] After Repair	[ ] Forging [ ] Other	[x] Other	[ ] Test Plan	
[x] Final Inspection		CLEANED & DEBURRED	[ ] Technique Card	
			SEE NOTES	

Part Information:
- **MTM Job Number:** 65707/1.0 -Sub:1 -Op:100
- **Resource ID:** 810-LIQUID PENETRANT INSPE
- **Part ID:** SE141-116
- **Part Name:** MODULAR COIL WINDING FOR
- **Serial Number:** MCWF C-1 (SE141-103-1)
- **Customer P.O.:** S005242-F
- **Customer Unit/Plant:**

Test Results:
- **Quantity Inspected:** 1
- **Quantity Accepted:** 1
- **Quantity Rejected:** 0
- **Run Hours:** 0.0

Customer Inspection Plan: SEE NOTES
- **Test Step:**
- **Revision:**
- **Material Test Number:**

Inspection Criteria:
- **Customer Specification:** ASTM A903/A903M
- **MTM Spec Number:** PS582 (REF NDT-WI-09)
- **Acceptance Standard:** ASTM A903 (SEE NOTES)

Inspection Materials Used:
- **Manufacturer:** SHERWIN
- **Type of Penetrant:** DP-51
- **Batch Number:** 41-E47
- **Developer:** D-100
- **Batch Number:** 410-L6

Penetrant Examination Processes:
- **Type:** II (Visible) / Dwell Time: 15 Minutes
- **Method:** A (Water Wash)
- **Method of Drying:** Normal Evaporation
- **Form:** e (nonaqueous for Type II visible dye) / Dwell Time: 12 Min

Inspection Requirements:

100 % of all accessible surfaces [ ] Joint Preps [ ] Root Pass SEE NOTES [ ] Back Gouge [ ] Cover Pass [x] Other

Notes:

PT 100% of the part as-cast surfaces as well as finished machine surfaces.

See PS582 for processing instructions.

During the inspection also perform a visual inspection of the casting surface per ASTM A802/A802M and accept per the same. Include reference to ASTM A802 on the certification.

Specification: ASTM A903/A903M

Method: ASTM E165-02

Acceptance Criteria: ASTM A903/A903M Level II for as cast surfaces

Acceptance Criteria: ASTM A903/A903M, Section 7, Table1, Level I for machined surfaces including the entire "T" section (high stress areas)

Certification: MTM certification to include the information per Supplementary Requirements S1 of ASTM A903/A903M
MTM NDT Cert: LPI CERTIFICATION

Deionized water used to preclean and rinse part.

This is to certify that the pieces specified have been inspected in accordance with the specifications shown.

Inspector: 667-J.BANNISTER **Date:** 09/21/2005 John P. Bannister Level II MTM P-21

Quality Assurance Documentation for Part ID: SE141-116 - Item: 25

Workorder: 65707/1-0 Sub:1 Op:120

Part: SE141-116 - MODULAR COIL WINDING FORM TYPE-C - PRODUCTION MODULAR COIL WINDING FORM TYPE-C

Drawing ID: SE141-116 Rev: 6			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
1* (10)	E8	47.19 ± .03	CMM	QA		00064	47.17 - 47.18	339-E.R 09-29-05			A
1* (11)	G8	R17.00 +.25 -.00	CMM	QA		00064	17.09	339-E.R 09-29-05			A
1* (20)	B8	47.19 ± .03	CMM	QA		00064	47.18 - 47.19	339-E.R 09-29-05			A
1* (30)	D6	47.19 ± .03	CMM	QA		00064	47.18 - 47.19	339-E.R 09-29-05			A
1* (40)	C6	47.19 ± .03	CMM	QA		00064	47.20	339-E.R 09-29-05			A
1* (50)		// .02 A	CMM	QA		00064	.0109	339-E.R 09-29-05			A
1* (60)	B6	// .02 A	CMM	QA		00064	.0045	339-E.R 09-29-05			A
1* (70)	F3	⌓ .5 A B C	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			A
2* (80)	H6	2X R.187 +.025 -.005	INDICATOR	QA		J-651	.185 - .187	339-E.R 09-29-05			A
2* (90)	G8	2X .03 X 45°		QA		VISUAL	NOT PRESENT	339-E.R 09-29-05			R
2* (100)	G8	.40 ± .010	CALIPER	QA		J-707	.39 - .41	339-E.R 09-29-05			A
2* (110)	G8	2X .030 X 45°		QA		VISUAL	NOT PRESENT	339-E.R 09-29-05			R
2* (120)	F7	2X .32	CALIPER	QA		J-707	.31 - .33	339-E.R 09-29-05			A
2* (130)	F7	2X R.11	RADIUS GAGE	QA		R-25	.12	339-E.R 09-29-05			A
2* (140)	G6	⌓ .1 R S T P TO M	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
2*	G6	4.790 ± .005		QA		VISUAL	ACCEPT	339-E.R			A

(150)								09-29-05			
2* (160)	G3	⌓ .1 R S T Q TO N	CMM	QA		00064	REFERENCE IGES INFORMATION	339-E.R 09-29-05			R
2* (170)	G3	4.790 ± .005 RECORD NUMBER USED TO IDENTIFY POINT Q		QA		VISUAL	ACCEPT	339-E.R 09-29-05			A
2* (180)	F5	⌓ .02 R S T M TO N	CMM	QA		00064	REFERENCE IGES INFORMATION	339-E.R 09-29-05			R
2* (190)	C5	⌖ .01 R S T 96X Ø.375-16 UNC .188 DEEP C'BORE Ø.625 AS SHOWN	CMM THREAD PLUG GA	QA		00064 A-46	.0043 - .1657 , .62 3 - .626	339-E.R 09-29-05			R
2* (200)	B4	2X .03 X 45°		QA		VISUAL	ACCEPT	339-E.R 09-29-05			A
3* (210)	G7	⌖ .01 A B C 8X Ø1-8 UNC THRU	CMM	QA		00064	.010 - .043	339-E.R 09-29-05			R
3* (220)	H4	.25 ± .01	CMM	QA		00064	SET	339-E.R 09-29-05			A
3* (230)	H3	▱ .01	CMM	QA		00064	REFERENCE IGES INFORMATION	242-M.G 11-09-05			A
3* (240)	F3	.25 ± .01	CMM	QA		00064	SET	339-E.R 09-29-05			A
3* (250)	F3	▱ .01	CMM	QA		00064	REFERENCE IGES INFORMATION	242-M.G 11-09-05			A
3* (260)	F5	R76.00	CMM	QA		00064	REFERENCE IGES INFORMATION	339-E.R 09-29-05			R
3* (270)	E5	R73.70	CMM	QA		00064	REFERENCE IGES INFORMATION	339-E.R 09-29-05			R
3* (280)	E4	⌖ .01 A B C 8X Ø1.13 THRU BACK SPOT FACE Ø2.38 MIN DEPTH FOR C'UP	CMM	QA		00064	.010 - .031	339-E.R 09-29-05			R
4*	H8	⌖ .010 D A N 3X Ø1.88 THRU Ø3.00 BACK SPOTFACE	CMM	QA		00064	.0304 - .0442 , >3. 00 SPOT, 1.87 - 1.8 8 DIA.	339-E.R			R

(290)		MIN TO CLEANUP	SCALE			J-922		09-29-05			
4*	H7	⌖ Ø.01 D A N	CMM	QA		00064	.019 - .020 , R .7	339-E.R			R
(300)		3X SPH R.75 TO .75 DEEP					4 - .745	09-29-05			
4*	H6	⌖ Ø.01 D A N	CMM	QA		00064	0.009 - 0.059, >3.0	295-C.W			R
		17X Ø1.88 THRU					0 SPOT, 1.87 - 1.88				
		Ø3.00 BACK SPOTFACE									
(310)		MIN TO CLEANUP	SCALE			J-922		10-01-05			
4*	H5	⌖ Ø.01 D A N	CMM	QA		00064	0.001 - 0.007, >2.3	295-C.W			A
		3X Ø1.13					8 SPOT				
		Ø2.38 BACK SPOTFACE									
(320)		MIN TO CLEANUP						10-01-05			
4*	E6	⌖ Ø.01 D A N	CMM	QA		00064	.022 - .039	339-E.R			R
(340)		3X Ø1.375-6 UNC THRU						09-29-05			
4*	E6	⌖ Ø.01 D A N	CMM	QA		00064	.0019 - .0182, >3.	339-E.R			R
		5X Ø1.88 THRU					00 SPOT				
		Ø3.00 BACK SPOTFACE									
(350)		MIN TO CLEANUP	SCALE			J-922		09-29-05			
4*	D4	⌖ Ø.01 D A N	CMM	QA		00064	.018, >3.00 SPOT.	339-E.R			R
		Ø1.88 THRU					1.879 DIA.				
		Ø3.00 BACK SPOTFACE									
(360)		MIN TO CLEANUP						09-29-05			
4*	B5	⌖ Ø.01 D A N	CMM	QA		00064	.047 - .054, 1.126	295-C.W			R
		3X Ø1.13					- 1.127				
		Ø2.38 BACK SPOTFACE									
(370)		MIN TO CLEANUP	SCALE			J-922		10-01-05			
5*	E8	⌖ Ø.01 E A J	CMM	QA		00064	0.77, >3.00 SPOT.	339-E.R			R
		Ø1.88 THRU									
		Ø3.00 BACK SPOTFACE									
(380)		MIN TO CLEANUP	SCALE			J-922		09-29-05			
5*	F6	3X Ø1.375-6 UNC THRU	THREAD PLUG GA	QA		A-375	ACCEPT	339-E.R			A
(400)								09-29-05			
5*	F6	⌖ Ø.01 E A J	CMM	QA		00064	.020 - .021	339-E.R			R
(410)		3X SPH R.75 TO .75 DEEP						09-29-05			
5*	F7	7X .25-20 UNC -2B	THREAD PLUG GA	QA		A-67	ACCEPT	339-E.R			A
(420)								09-29-05			
5*	E7	⌖ Ø.01 E A J	CMM	QA		00064	.008 - .040, >3.00	339-E.R			R
		24X Ø1.88 THRU					SPOT.				
		Ø3.00 BACK SPOTFACE									

(430)		MIN TO CLEANUP	SCALE			J-922		09-29-05			
5*	E7	⌖ Ø.01 E A J	CMM	QA		00064	.013 - .037	339-E.R			R
		3X Ø1.5 TO 2.00 DEEP									
(440)		Ø3.00 TO 1.00 DEEP						09-29-05			
5*	D7	3X Ø1.88 THRU	CMM	QA		00064	1.87 - 1.88, >3.00	339-E.R			A
		Ø3.00 BACK SPOTFACE									
		MIN TO CLEANUP									
(450)			SCALE			J-922		09-29-05			
5*	G2	SPH R.75	CMM	QA		00064	.736 - .74	339-E.R			A
		TO .75 DEEP									
(460)								09-29-05			
6*	F2	▱ .02	05	QA			CANNOT CHECK DUE	295-C.W			A
(510)							ASSY	10-01-05			
6*	F2	1.125 ± .010	05	QA			CANNOT CHECK DUE	295-C.W			A
(520)							ASSY	10-01-05			
6*	F2	2.250 ± .010	05	QA			CANNOT CHECK DUE	295-C.W			A
(530)							ASSY	10-01-05			
6*	E2	⌖ Ø.01 F P V	05	QA			CANNOT CHECK DUE	295-C.W			A
		7X					ASSY				
		Ø1.625 THRU BOTH SIDES									
(540)		14X Ø3.00 TO .500 BOTH SIDES						10-01-05			
7*	G2	R7.00	05	QA			REFERENCE IGES INF	339-E.R			R
(550)							RMATION	09-29-05			
7*	F2	2X R1.50	05	QA			REFERENCE IGES INF	339-E.R			R
(560)							RMATION	09-29-05			
7*	E2	2.52 ± .010	CMM	QA		00064	2.51	339-E.R			A
(570)								09-29-05			
7*	E2	90°	CMM	QA		00064	87.92	339-E.R			R
(580)								09-29-05			
7*	E1	2.0°	CMM	QA		00064	2.04	339-E.R			A
(590)								09-29-05			
7*	E2	2.64 ± .010	DEPTH MICROMET	QA		J-851	2.64	339-E.R			A
(600)								09-29-05			
7*	E2	6.50 ± .010	CMM	QA		00064	6.486	339-E.R			R
(610)								09-29-05			
7*	E2	3.06 ± .010	CMM	QA		00064	REFERENCE IGES INF	339-E.R			R
(620)							RMATION	09-29-05			

7* (630)	D2	R4.00 ± .010	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
7* (640)	D3	2.10 ± .010	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
8* (650)	G7	4.00 ± .010	CMM	QA		00064	3.98	339-E.R 09-29-05			R
8* (660)	G7	.25 ± .010	CMM	QA		00064	SET	339-E.R 09-29-05			A
8* (670)	G7	R4.00 ± .010	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
8* (680)	F7	2.00 ± .010	CMM	QA		00064	1.99	339-E.R 09-29-05			A
8* (690)	E3	9.38 ± .010	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
8* (700)	E2	6.0°	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
8* (710)	C2	Ø8.00 ± .010	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
8* (720)	B3	5.9°	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
8* (730)	B3	7.81 ± .010	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
8* (740)	C6	7.25 ± .010	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
8* (750)	D7	6X Ø..375-16 UNC TO .75 DEEP .03 X 45° CHAMFER	THREAD PLUG GA CALIPER	MFG		A-46 J-707	ACCEPT THREAD/CHA ER, .53 - 1.32 DEPT H	339-E.R 09-29-05			R
8* (760)	D7	13.6 °	CMM	MFG		00064	13.16	339-E.R 09-29-05			A
8* (770)	D7	5.88 ± .010	CALIPER	QA		J-707	5.89	339-E.R 09-29-05			A
8* (780)	D7	2.19 ± .010	CMM	QA		00064	2.172 - 2.198	339-E.R 09-29-05			R
8* (790)	D7	2.19 ± .010	CMM	QA		00064	2.176 - 2.191	339-E.R 09-29-05			R
8* (800)	B7	4X R.50	RADIUS GAGE	QA		R-25	.50	339-E.R 09-29-05			A

8* (810)	B7	3.50 ± .010	CALIPER	QA		J-707	3.60	339-E.R 09-29-05			A
8* (820)	B7	1.75 ± .010	SCALE	QA		J-922	1.75	339-E.R 09-29-05			A
8* (830)	C8	2X 1.56 ± .010 THRU	CMM	QA		00064	1.) 1.56 2.) 1.79	339-E.R 09-29-05			R
8* (840)	C8	3.75 ± .010	CMM	QA		00064	3.90	339-E.R 09-29-05			R
8* (850)	C8	2X 7.50 ± .010 THRU	CMM	QA		00064	1.) 7.53 2.) 7.63	339-E.R 09-29-05			R
8* (860)	C8	8X R.25	RADIUS GAGE	QA		R-25	.25 - .28	339-E.R 09-29-05			R
8* (870)	C8	2X 2.52 ± .010	CMM	QA		00064	2.04 - 2.08 , 2.65 - 2.66	339-E.R 09-29-05			R
8* (880)	E2	Ø8.00 ± .010	CMM	QA		00064	7.992	339-E.R 09-29-05			A
9* (890)	F7	4X Ø.63 ± .010 THRU	PIN GAGE	QA		J-652	.62	339-E.R 09-29-05			A
9* (900)	E7	2.54 ± .010	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
9* (910)	E7	5.08 ± .010	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
9* (920)	F3	4X Ø.63 ± .010 THRU	PIN GAGE	QA		J-652	SEE #890	339-E.R 09-29-05			A
9* (930)	F3	2X Ø .50 ± .010 THRU	PIN GAGE	MFG		J-652	.498	339-E.R 09-29-05			A
9* (940)	E3	2.44 ± .010	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
9* (950)	E3	1.22 ± .010	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
9* (960)	C7	4X Ø.63 ± .010 THRU	PIN GAGE	QA		J-652	.622 - .624	339-E.R 09-29-05			A
9* (970)	C6	2X Ø.25 T.C. HOLE TO 2.5 DEEP	PIN GAGE	QA		J-652	.24	339-E.R 09-29-05			A
10* (980)	C8	⌓ .125 A B C	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
10*	C8	⌓ .5 A B C	CMM	QA		00064	REFERENCE IGES INF	339-E.R			R

(990)							RMATION	09-29-05			
10* (1000)	C5	⌓ .02 R T S	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
10* (1010)	C4	⌓ .125 A B C	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
10* (1020)	G1	⌓ .02 R T S	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
10* (1030)	E1	⌓ .5 A B C	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
* (1040)		UOS ALL MACHINED SURFACES TO BE 250 RMS SURFACE FINISH RECORD RANGE	PROFILOMETER	QA		J-1152	31 - 500	339-E.R 09-29-05			R
1* (1050)		RECORD THE WEIGHT OF THE PART 6000LBS MAX		QA		SCALE	5080LBS	339-E.R 09-29-05			A
4* (1060)	H7	22.13 ± .010	CMM	QA		00064	TAP	339-E.R 09-29-05			R
4* (1070)	H7	47.79 ± .010	CMM	QA		00064	47.76	339-E.R 09-29-05			R
4* (1080)	H6	59.18 ± .010	CMM	QA		00064	59.16	339-E.R 09-29-05			R
4* (1090)	H6	73.27 ± .010	CMM	QA		00064	TAP	339-E.R 09-29-05			R
4* (1100)	H5	80.49	CMM	QA		00064	80.46	339-E.R 09-29-05			R
4* (1110)	H5	87.87 ± .010	CMM	QA		00064	87.84	339-E.R 09-29-05			R
4* (1120)	H5	89.64 ± .010	CMM	QA		00064	89.64	339-E.R 09-29-05			A
4* (1130)	G4	31.83 ± .010	CMM	QA		00064	TAP	339-E.R 09-29-05			R
4* (1140)	F4	24.10 ± .010	CMM	QA		00064	24.08	339-E.R 09-29-05			A
4* (1150)	F4	11.48 ± .010	CMM	QA		00064	11.46	339-E.R 09-29-05			R

4* (1160)	E4	5.20 ± .010	CMM	QA		00064	5.19	339-E.R 09-29-05			A
4* (1170)	D4	18.31 ± .010	CMM	QA		00064	18.32	339-E.R 09-29-05			A
4* (1180)	D4	32.50 ± .010	CMM	QA		00064	32.50	339-E.R 09-29-05			A
4* (1190)	C5	77.13 ± .010	CMM	QA		00064	77.13	339-E.R 09-29-05			A
4* (1200)	C6	55.56 ± .010	CMM	QA		00064	55.55	339-E.R 09-29-05			A
4* (1210)	B7	23.74 ± .010	CMM	QA		00064	23.73	339-E.R 09-29-05			A
4* (1220)	C7	37.09 ± .010	CMM	QA		00064	37.08	339-E.R 09-29-05			A
4* (1230)	D8	17.22 ± .010	CMM	QA		00064	17.23	339-E.R 09-29-05			A
4* (1240)	F8	28.17 ± .010	CMM	QA		00064	TAP	339-E.R 09-29-05			R
4* (1250)	G8	12X .250-20 UNC-2B	THREAD PLUG GA	QA		A-517 VISUAL	ACCEPT	339-E.R 09-29-05			A
4* (1260)	G8	40.75 ± .010	CMM	QA		00064	40.74	339-E.R 09-29-05			A
4* (1270)	G8	43.42 ± .010	CMM	QA		00064	TAP	339-E.R 09-29-05			R
4* (1280)	D1	12X .25-20 UNC Ø.5 X 82° INCL. CHAMFER	THREAD PLUG GA	QA		A-517 VISUAL	ACCEPT	339-E.R 09-29-05			A
5* (1290)	H8	88.39 ± .010	CMM	QA		00064	88.39	339-E.R 09-29-05			A
5* (1300)	H7	86.42 ± .010	CMM	QA		00064	86.40	339-E.R 09-29-05			R
5* (1310)	H6	59.08 ± .010	CMM	QA		00064	59.06	339-E.R 09-29-05			A
5* (1320)	H5	28.71 ± .010	CMM	QA		00064	28.69	339-E.R 09-29-05			R
5* (1330)	G5	32.42 ± .010	CMM	QA		00064	32.41	339-E.R 09-29-05			A

5* (1340)	D4	22.117 ± .005	CMM	QA		00064	22.118	339-E.R 09-29-05			A
5* (1350)	D4	38.14 ± .010	CMM	QA		00064	38.14	339-E.R 09-29-05			A
5* (1360)	D5	21.33 ± .010	CMM	QA		00064	21.32	339-E.R 09-29-05			A
5* (1370)	D7	87.62 ± .010	CMM	QA		00064	87.63	339-E.R 09-29-05			A
5* (1380)	E8	7.53 ± .010	CMM	QA		00064	7.53	339-E.R 09-29-05			A
5* (1390)	E8	4.91 ± .010	CMM	QA		00064	4.88	339-E.R 09-29-05			R
5* (1400)	G8	36.13 ± .010	CMM	QA		00064	36.12	339-E.R 09-29-05			A
7* (1410)	D4	2.1°	CMM	QA		00064	REFERENCE IGES INF RMATION	339-E.R 09-29-05			R
8* (1420)	D8	2.63 ± .010	CMM	QA		00064	2.63 - 2.65	339-E.R 09-29-05			R

Quality Assurance Documentation for Part ID: SE141-116 - Item: 26

Workorder: 65707/1-0 Sub:1 Op:140

Part: SE141-116 - MODULAR COIL WINDING FORM TYPE-C - PRODUCTION MODULAR COIL WINDING FORM TYPE-C

Drawing ID: SE141-103 Rev: 2			INSPECTION INSTRUCTIONS			RESULTS		INSPECTED BY			
SHEET	ZONE	CHARACTERISTIC	GAGE/EQUIP	BY	SAMPLE	SER#	DATA/REMARKS	INSP	VERFD	AUDIT	
* (10)		INSPECT AND RECORD RESISTANCE ACROSS BOLT INSUL. VALUE TO BE >500 kOHM'S		QA			35,000 K-OHMS	242-M.G 10-26-05			A
* (20)		INSPECT AND RECORD RANGE OF RESISTANCE ACROSS POLOIDAL BREAK MIDPLANE AND BOLTS VALUE TO BE >500 kOHM'S		QA			HOLE 2 > 100.000 K-OHMS; ALL OTHERS A P. INFINITY	295-C.W 10-01-05			A

Employees: 212-J.Lehr / 242-M.Griffith / 295-C.Weaver / 339-E.Root