PRELIMINARY

Energy Industries of Ohio

Contract # S005242-F

Modular Coil Winding Forms

C-5 Documentation Package

Part 1 – Metal Tek International
Casting Data Package

1/24/2006

C-5 Documentation Package

List of Documents 1-24-2006

MetalTek INTERNATIONAL

Carondelet Division

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

Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C5 Coil
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD
Ladle#1 Heat 30441
Original Chemistry

Cert Number 172810-1
Pour Date 8/8/2005

Element	Min	Actual	Max
C	0.04	0.05	0.07
MN	2.3	2.6	2.8
SI	0.0	0.3	0.7
CR	18.0	18.2	18.5
NI	13.0	13.3	13.5
MO	2.1	2.3	2.5
P	0.0	0.023	0.035
S	0.0	0.011	0.025
N	0.24	0.26	0.28

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

Superior Quality Engineered Metal Products

www.MetalTekInt.Com

MetalTek INTERNATIONAL

Carondelet Division

8600 Commercial Blvd. - Pevely, MO 63070 USA
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Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C5 Coil
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD
Ladle#2 Heat 30442
Original Chemistry

Cert Number 172810-1
Pour Date 8/8/2005

Element	Min	Actual	Max
C	0.04	0.05	0.07
MN	2.3	2.4	2.8
SI	0.0	0.4	0.7
CR	18.0	18.2	18.5
NI	13.0	13.3	13.5
MO	2.1	2.3	2.5
P	0.0	0.033	0.035
S	0.0	0.013	0.025
N	0.24	0.24	0.28

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

MetalTek INTERNATIONAL

Carondelet Division

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Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C5 Coil
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD
Ladle#3 Heat 30445
Original Chemistry

Cert Number 172810-1
Pour Date 8/8/2005

Element	Min	Actual	Max
C	0.04	0.05	0.07
MN	2.3	2.4	2.8
SI	0.0	0.3	0.7
CR	18.0	18.3	18.5
NI	13.0	13.2	13.5
MO	2.1	2.4	2.5
P	0.0	0.03	0.035
S	0.0	0.01	0.025
N	0.24	0.25	0.28

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

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Carondelet Division

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Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C5
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD

Cert Number 172810-1
Pour Date 8/8/2005

Weighted average of 3 heats – 30441(39%),30442(21%),30445(40%) Total Weight 31732 lbs.
Original Chemistry

Element	Min	Actual	Max
C	0.04	0.05	0.07
MN	2.3	2.5	2.8
SI	0.0	0.3	0.7
CR	18.0	18.2	18.5
NI	13.0	13.3	13.5
MO	2.1	2.3	2.5
P	0.0	0.028	0.035
S	0.0	0.011	0.025
N	0.24	0.25	0.28

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

1A

Carondelet Division

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

Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C5 Coil
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD
Ladle#1 Heat 30441
Analysis performed by Wisconsin Centrifugal

Cert Number 172810-1
Pour Date 8/8/2005

Element	Min	Actual	Max
C	0.04	0.02	0.07
MN*	2.3	2.2	2.8
SI	0.0	0.3	0.7
CR	18.0	18.2	18.5
NI	13.0	13.5	13.5
MO	2.1	2.4	2.5
P	0.0	0.025	0.035
S	0.0	0.010	0.025
N	0.24	0.25	0.28

* See Corrective Action Number 1323.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

2 A

MetalTek INTERNATIONAL

Carondelet Division

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

Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C5 Coil
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD
Ladle#2 Heat 30442
Analysis performed by Wisconsin Centrifugal

Cert Number 172810-1
Pour Date 8/8/2005

Element	Min	Actual	Max
C	0.04	0.05	0.07
MN*	2.3	1.8	2.8
SI	0.0	0.4	0.7
CR	18.0	18.2	18.5
NI	13.0	13.4	13.5
MO	2.1	2.5	2.5
P	0.0	0.034	0.035
S	0.0	0.018	0.025
N	0.24	0.23	0.28

* See Corrective Action Number 1323.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

Superior Quality Engineered Metal Products

www.MetalTekInt.Com

3A

MetalTek INTERNATIONAL

Carondelet Division

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

Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C5 Coil
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD
Ladle#3 Heat 30445
Analysis performed by Wisconsin Centrifugal

Cert Number 172810-1
Pour Date 8/8/2005

Element	Min	Actual	Max
C	0.04	0.04	0.07
MN*	2.3	2.0	2.8
SI	0.0	0.3	0.7
CR	18.0	18.3	18.5
NI	13.0	13.3	13.5
MO	2.1	2.4	2.5
P	0.0	0.031	0.035
S	0.0	0.018	0.025
N	0.24	0.24	0.28

* See Corrective Action Number 1323.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

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MetalTek INTERNATIONAL

Carondelet Division

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

Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C5
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD

Cert Number 172810-1
Pour Date 8/8/2005

Weighted average of 3 heats – 30441(39%),30442(21%),30445(40%) Total Weight 31732 lbs.
Analysis performed by Wisconsin Centrifugal

Element	Min	Actual	Max
C	0.04	0.04	0.07
MN*	2.3	2.0	2.8
SI	0.0	0.3	0.7
CR	18.0	18.2	18.5
NI	13.0	13.4	13.5
MO	2.1	2.4	2.5
P	0.0	0.030	0.035
S	0.0	0.015	0.025
N	0.24	0.24	0.28

* See Corrective Action Number 1323.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

Superior Quality Engineered Metal Products

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1B

MetalTek INTERNATIONAL

Carondelet Division

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

Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C5 Coil
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD
Ladle#1 Heat 30441
Retest after preventive maintenance

Cert Number 172810-1
Pour Date 8/8/2005

Element	Min	Actual	Max
MN	2.3	2.3	2.8
SI	0.0	0.3	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	0.029	0.035
S	0.0	0.012	0.025

C & N not analyzed by spectrometer on retest.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

Superior Quality Engineered Metal Products

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2B

MetalTek INTERNATIONAL

Carondelet Division

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

Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C5 Coil
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD
Ladle#2 Heat 30442
Retest after preventive maintenance

Cert Number 172810-1
Pour Date 8/8/2005

Element	Min	Actual	Max
MN*	2.3	1.8	2.8
SI	0.0	0.4	0.7
CR	18.0	18.3	18.5
NI	13.0	13.3	13.5
MO	2.1	2.5	2.5
P	0.0	0.034	0.035
S	0.0	0.012	0.025

- See Corrective Action Number 1323.
  C & N not analyzed by spectrometer on retest.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

Superior Quality Engineered Metal Products

3B

Carondelet Division

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

Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C5 Coil
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD
Ladle#3 Heat 30445
Retest after preventive maintenance

Cert Number 172810-1
Pour Date 8/8/2005

Element	Min	Actual	Max
MN*	2.3	2.0	2.8
SI	0.0	0.3	0.7
CR	18.0	18.4	18.5
NI	13.0	13.3	13.5
MO	2.1	2.4	2.5
P	0.0	0.033	0.035
S	0.0	0.012	0.025

* See Corrective Action Number 1323.
C & N not analyzed by spectrometer on retest.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

4 B

MetalTek INTERNATIONAL

Carondelet Division

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

Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2
Pattern Number MCWF-C5
CAF Metal Designation CF8MNMnMod
Material Spec CF8MNMnMOD

Cert Number 172810-1
Pour Date 8/8/2005

Weighted average of 3 heats – 30441(39%),30442(21%),30445(40%) Total Weight 31732 lbs.
Retest after preventive maintenance

Element	Min	Actual	Max
MN*	2.3	2.1	2.8
SI	0.0	0.3	0.7
CR	18.0	18.3	18.5
NI	13.0	13.3	13.5
MO	2.1	2.4	2.5
P	0.0	0.032	0.035
S	0.0	0.012	0.025

* See Corrective Action Number 1323.
C & N not analyzed by spectrometer on retest.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

Superior Quality Engineered Metal Products

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MetalTek INTERNATIONAL

Carondelet Division

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

Material Test Report

ENERGY INDUSTRIES OF OHIO

Purchase Order Number PPPL-FP-LTS-2 Heat Number 29198 Pour Date 4/28/2005

Pattern Number SE-141-073 COIL C SHIM (-3 thru -6 Parts) Cert Number S73220-2 and
SE-141-033 COIL A SHIM (-1 thru -6 Parts) Cert Number S76220-1

CAF Metal Designation CF8MNMnMod

Material Spec CF8MNMN MOD

Revised 9/24/05

Element	Min	Actual	Max
C	0.040	0.070	0.070
CR	18.000	18.100	18.500
MN	2.300	2.970	2.800
MO	2.100	2.450	2.500
N	0.240	0.255	0.280
NI	13.000	13.120	13.500
P*	0.000	0.013	0.035
S*	0.000	0.010	0.025
SI	0.000	0.700	0.700

MN & SI previously reported on CA 1308 and were accepted.

*P & S taken from test from heat parts were poured from and analyzed by wet chemistry, ASTM E1019-03 for sulfur and Gravimetric for phosphorous.

This report covers the eleven castings poured from heat 29198. Only parts listed above however will be shipped for this order. Each casting has a unique number stamped in the part adjacent to the pattern number to differentiate the part and subsequent reporting that will be traced to the casting.

Specification limits have been updated to latest specification.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

-045 ER316 MNN F

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	3018926/78309
		Item No.	692129
Customer	CK SUPPLY Contact Ernie Simpson Eureka (MISSOURI) 63025 UNITED STATES	Quantity	450,0 KG
		Customer ref.	P.O.: SL 057549
		LSW Order No.	SD424496

Chemical analysis (%) EN10204 3.1B

C	Si	Mn	P	S	Cr	Ni	Mo	Cu	N
0,02	**0,4**	**7,3**	**0,019**	**0,001**	**20,1**	**16,3**	**2,9**	**0,1**	**0,200**

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**	**10/02/2005**	**3018926/7830**

Registered Office
Nieuwe Dukenburgseweg 20
6534 AD NIJMEGEN

Post address:
P.O. Box 253
6500 AG Nijmegen
NETHERLANDS

Telephone: 31 24 3522911
Fax: 31 24 3522200

LINCOLN STANDARD BV QUALITY SYSTEM CERTIFICATE 5011

QA22Urev3
3301013 rev. 00

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2810 Clark Avenue • St. Louis, MO 63103-2574 • (314) 531-8080 • FAX (314) 531-8085

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

METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

August 8, 2005
Lab No. 05P-2334
P.O. No. 21324

Attention: CHUCK RUUD

REPORT OF MECHANICAL TESTS

SAMPLE ID:
1) STOCK# LNM 4455, LINCOLN LOT 3018926/78309
2) STOCK# LNM 4455, LINCOLN LOT 3017006/72262
3) STOCK# LNM 4455, LINCOLN LOT 3012668/82743
4) STOCK# B316NF METRODE, W021735

Sample ID	Original Area Sq. Inches	Reduced Area Sq. Inches	Reduction in Area %	Modules of Elasticity	Yield Strength PSI	Tensile Strength PSI	Elongation (2.0" Gage Length) in.	%
1	0.1385	0.0897	54.3	24.5 Msi	56900	93900	0.84	42.0
2	0.1886	0.0935	50.4	24.9 Msi	54900	92100	0.85	42.5
3	0.1909	0.0951	50.2	22.6 Msi	57400	93700	0.83	41.5
4	0.1901	0.0962	49.4	23.0 Msi	54800	88200	0.75	37.5

Round, reduced section all weld tensiles

Yield taken at .2% offset

Tested in accordance with ASTM A 370-03a

Identification of tested specimens provided by the client.

Karl Schmitz, Director
Materials Testing

KS/tlv

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METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

August 8, 2005
Lab No. 05P-2334
P.O. No. 21324

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): STOCK# LNM 4455, LINCOLN LOT 3018926/78309
STOCK# LNM 4455, LINCOLN LOT 3017006/72262

SPECIFICATION: ASTM A 370-03a

SPECIMEN TYPE: "A" Vee Notch

SPECIMEN SIZE: 10 mm x 10 mm (All Weld)

TEMPERATURE OF TEST: 293°K

REQUIREMENTS:

ALL WELD	FOOT LBS.	LATERAL EXPANSION	% SHEAR
78309-7	97	0.074	50
78309-8	96	0.076	50
78309-9	108	0.075	50
Average	100	0.075	50

ALL WELD	FOOT LBS.	LATERAL EXPANSION	% SHEAR
72262-7	126	0.098	50
72262-8	102	0.080	50
72262-9	123	0.087	50
Average	117	0.088	50

Identification of tested specimen provided by client.

Karl Schmitz, Director
Materials Testing

KS/tlv

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METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

August 8, 2005
Lab No. 05P-2334
P.O. No. 21324

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): STOCK# LNM 4455, LINCOLN LOT 3012668/82743
STOCK# B316NF METRODE, W021735

SPECIFICATION: ASTM A 370-03a

SPECIMEN TYPE: "A" Vee Notch

SPECIMEN SIZE: 10 mm x 10 mm (All Weld)

TEMPERATURE OF TEST: 293°K

REQUIREMENTS:

ALL WELD	FOOT LBS.	LATERAL EXPANSION	% SHEAR
82743-7	100	0.082	50
82743-8	99	0.076	50
82743-9	94	0.072	50
Average	98	0.077	50
ALL WELD	**FOOT LBS.**	**LATERAL EXPANSION**	**% SHEAR**
W021735-7	102	0.101	50
W021735-8	88	0.073	50
W021735-9	88	0.080	50
Average	93	0.085	50

Identification of tested specimen provided by client.

Karl Schmitz, Director
Materials Testing

KS/tlv

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

September 13, 2005

CERTIFICATION

WMT&R Report No. 5-34328
P.O. No. 19386 Rel No.18
Requisition No. 4934

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

Attention: Jim Galaske

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: 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: 0.0030 in./in./min., 0.0500 in./min./in.
MATERIAL: 316 S/S

DISPOSITION: Acceptable

Reference	Lot No. | Batch No. | Specimen ID	TestLog Number	Temp. °F	UTS ksi	0.2% YS ksi	Elong %	RA %	Modulus Msi	Ult. Load lbf	0.2% YLD. lbf
Lincoln LNM4455	3018926 | 78309 | Tensile	C43938	-320	182.1	128.2	34	24	27.0	17560	12360

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

DISPOSITION: Acceptable

Reference	Lot No. | Batch No. | Specimen ID	TestLog Number	Orig. Dia. (in.)	Final Dia. (in.)	4D Orig GL (in.)	4D Final GL (in.)	Orig. Area (sq. in.)	Machine Number	A\U\R
Lincoln LNM4455	3018926 | 78309 | Tensile	C43938	0.3504	0.3048	1.40	1.87	0.09643131	M9	A

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

Requirements supplied by MetalTek International.

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

9-13-05
September 13, 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
621-01 & 621-02

Accredited Nadcap Materials Testing Laboratory

11

September 13, 2005

CERTIFICATION

WMT&R Report No. 5-34328
P.O. No. 19386 Rel No.18
Requisition No. 4934

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

Attention: Jim Galaske

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: ASTM E23-02
REQUIREMENTS: Energy (Min 35\Max ---)
MATERIAL: Lincoln LNM4455
SAMPLE TYPE: Charpy V-Notch
DISPOSITION: Acceptable

Reference	Lot No. | Batch No. | Specimen ID	TestLog Number	Sample Size	Temp. °F	Energy ft-lbs	Mils Lat Exp	% Shear Fracture	A\U\R
Lincoln LNM4455	3018926 | 78309 | Cvn-1	C43939	Standard	-320	56	18	40	Acceptable
Lincoln LNM4455	3018926 | 78309 | Cvn-2	C43940	Standard	-320	52	18	40	Acceptable
Lincoln LNM4455	3018926 | 78309 | Cvn-3	C43941	Standard	-320	53	12	40	Acceptable

Requirements supplied by MetalTek International.

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

9-13-05
September 13, 2005

9A

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	3018513/78308
		Item No.	692129
Customer	EUROWELD MOORESVILLE N.C. 28117 UNITED STATES	Quantity	105,0 KG
		Customer ref.	P.O.: 05 - 46
		LSW Order No.	SD427896

Chemical analysis (%) EN10204 2.2

C	Si	Mn	P	S	Cr	Ni	Mo	Cu	N
0,01	0,5	7,3	0,015	0,001	20,3	15,4	2,9	0,1	0,19

Mechanical tests, all weld metal EN10204 2.2

Tensile testing

Cond.	Temp. °C	Rp0.2 N/mm2	Rm N/mm2	A5 %
AW	RT	407	623	41

Impact testing

Cond.	Temp.1 °C	Av1 J
AW	-196	67

Additional information EN10204 2.2

Other tests

Remarks

Impact testing (individual values): 70J - 65J - 67J.

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. Nagels	QA Administrator	22/03/2005	3018513/7830

Registered Office — Nieuwe Dukenburgseweg 20, 6534 AD NIJMEGEN
Post address — P.O. Box 253, 6500 AG Nijmegen
Telephone — 31 24 3522911
Fax: — 31 24 3522200

V220rev3

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METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

August 16, 2005
Lab No. 05P-2532
P.O. No. 21324

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): LNM 4455, LINCOLN LOT 3018513/78308

SPECIFICATION: ASTM A 370-03a

SPECIMEN TYPE: "A" Vee Notch

SPECIMEN SIZE: 10 mm x 10 mm

TEMPERATURE OF TEST: 293°K

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
LNM4455-7	104	0.085	100
LNM4455-8	106	0.093	100
LNM4455-9	99	0.084	100
Average	103	0.087	100

Identification of tested specimen provided by client.

Karl Schmitz, Director
Materials Testing

KS/tlv

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Pevely, MO 63070

August 16, 2005
Lab No. 05P-2532
P.O. No. 21324

Attention: CHUCK RUUD

REPORT OF MECHANICAL TESTS

SAMPLE ID: LNM 4455, LINCOLN LOT 3018513/78308

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) %	Modules of Elasticity
LNM4455	0.1932	0.0866	55.2	65200	95200	0.76	38.0	23.4

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.

Karl Schmitz, Director
Materials Testing

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11 A

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
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A2LA ACCREDITED 621-01 & 621-02

Accredited Nadcap Materials Testing Laboratory

October 18, 2005

CERTIFICATION

Section 1 of 1
WMT&R Report No. 5-35979
Requisition No. 4972

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

Attention: Jim Galaske

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
SOAK TIME: 5 Minutes
SPEED OF TESTING: 0.0030 in./in./min., 0.0500 in./min./in.
MATERIAL: METALTEK CF8MNMNMOD

DISPOSITION: Report

Specimen ID	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
3018513/78308	C54936	-320	184.9	123.7	33	33	32.8	18470	12350	0.3566	0.2926	1.40	1.86	0.09987403	M9	R

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

Roy E. Starr\Matt Wojton
✓ Technical Services Manager____ Tensile Supervisor

10-18-05
October 18, 2005

11 A

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METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

October 5, 2005
Lab No. 05P-3096
P.O. No. 21324

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): WELD PLATE- 3018513 / 78308

SPECIFICATION: ASTM A 370-03a

SPECIMEN TYPE: "A" Vee Notch

SPECIMEN SIZE: 10 mm x 10 mm

TEMPERATURE OF TEST: -320°F

REQUIREMENTS: minimum 35 ft / lbs.

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
3018513/78308-1	48	0.033	50
3018513/78308-2	65	0.045	50
3018513/78308-3	48	0.033	50
Average	54	0.037	50

Identification of tested specimen provided by client.

Karl Schmitz, Director
Materials Testing

KS/tlv

7A

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Accredited Nadcap Materials Testing Laboratory

October 18, 2005

CERTIFICATION

Section 1 of 1

WMT&R Report No. 5-35978
Requisition No. 4972

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

Corrected Date
November 18, 2005

Test 1

Attention: Jim Galaske

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 E21-05
SOAK TIME: 5 Minutes
SPEED OF TESTING: 0.0030 in./in./min., 0.0500 in./min./in.
MATERIAL: METALTEK CF8MNMNMOD

DISPOSITION: Report

Specimen ID	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
C5-Z1	C54933	-320	182.5	112.6	31	28	33.0	18350	11320	0.3578	0.3039	1.40	1.83	0.10054733	M9	R
C5-Z2	C54934	-320	166.1	98.3	52	52	31.8	16740	9903	0.3582	0.2471	1.40	2.13	0.10077227	M9	R
C5-Z3	C54935	-320	163.7	95.5	59	58	28.0	16490	9622	0.3581	0.2316	1.40	2.23	0.10071601	M9	R

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

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

11/18/05
November 18, 2005

7B

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November 21, 2005

CERTIFICATION

Section 1 of 2

WMT&R Report No. 5-39106
P.O. No. 19386
Requisition No. 4985

Test 2

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

Attention: Jim Galaske

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 E21-05
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: 0.003 in./in./min., 0.05 in./min./in.
MATERIAL: Metaltek CF8MNMnMOD

DISPOSITION: Acceptable

Specimen ID	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
C5-Z2	C67051	-320	172.3	102.5	41	32	28.2	16630	9893	0.3506	0.2885	1.40	1.98	0.09654142	M9	A
C5-Z3	C67052	-320	163.5	95.0	64	67	25.9	15830	9200	0.3511	0.2006	1.40	2.30	0.09681698	M9	A

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

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

November 21, 2005

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November 21, 2005

CERTIFICATION

Section 2 of 2

WMT&R Report No. 5-39106
P.O. No. 19386

MetalTek International

TENSILE RESULTS: ASTM E21-05

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: 0.003 in./in./min., 0.05 in./min./in.

MATERIAL: Metaltek CF8MNMnMOD

DISPOSITION: Unacceptable

Specimen ID	TestLog Number	Temp. °F	UTS ksi	0.2% YS ksi	Elong %	RA %	Modulus Msi	Codes	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
C5-Z1	C67050	-320	177.4	111.2	29	28	34.5	D	17120	10730	0.3505	0.2982	1.40	1.81	0.09648636	M9	U

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

Requirements provided by MetalTek International

Reference: Tensile Results Reported on WMT&R Report 5-37644 and Hardness, Microstructure Results on WMT&R Report 5-39107

D - Failed outside middle half of gage length.

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

11-21-05
November 21, 2005

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METALTEK INTERNATIONAL
8600 Commercial Blvd.
Pevely, MO 63070

August 18, 2005
Lab No. 05P-2592
P.O. No. 21324

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): C5- Z1, Z2, Z3

SPECIFICATION: ASTM A 370-03a

SPECIMEN TYPE: "A" Vee Notch

SPECIMEN SIZE: 10 mm x 10 mm

TEMPERATURE OF TEST: 293°K

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z1-7	136	0.083	30
Z1-8	126	0.079	30
Z1-9	128	0.081	30
Average	130	0.081	30
SAMPLE ID	**FOOT LBS.**	**LATERAL EXPANSION**	**% SHEAR**
Z2-7	138	0.080	30
Z2-8	119	0.065	20
Z2-9	137	0.107	40
Average	131	0.084	30
SAMPLE ID	**FOOT LBS.**	**LATERAL EXPANSION**	**% SHEAR**
Z3-7	139	0.099	30
Z3-8	174	0.096	40
Z3-9	156	0.089	40
Average	156	0.095	37

Identification of tested specimen provided by client.

Karl Schmitz, Director
Materials Testing

KS/tlv

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August 18, 2005
Lab No. 05P-2592
P.O. No. 21324

Attention: Chuck Ruud

REPORT OF CHARPY IMPACT TEST

MATERIAL (SAMPLE ID): C5- Z1, Z2, Z3

SPECIFICATION: ASTM A 370-03a

SPECIMEN TYPE: "A" Vee Notch

SPECIMEN SIZE: 10 mm x 10 mm

TEMPERATURE OF TEST: 77°K

BASE METAL	FOOT LBS.	LATERAL EXPANSION	% SHEAR
Z1-7	78	0.047	40
Z1-8	82	0.053	40
Z1-9	82	0.050	40
Average	81	0.050	40
SAMPLE ID	**FOOT LBS.**	**LATERAL EXPANSION**	**% SHEAR**
Z2-7	72	0.043	40
Z2-8	75	0.039	40
Z2-9	72	0.043	40
Average	73	0.042	40
SAMPLE ID	**FOOT LBS.**	**LATERAL EXPANSION**	**% SHEAR**
Z3-7	93	0.053	40
Z3-8	86	0.067	50
Z3-9	82	0.065	40
Average	87	0.062	43

Identification of tested specimen provided by client.

Karl Schmitz, Director
Materials Testing

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Pevely, MO 63070

August 18, 2005
Lab No. 05P-2592
P.O. No. 21324

Attention: CHUCK RUUD

REPORT OF MECHANICAL TESTS

SAMPLE ID: C5- Z1, Z2, Z3

Sample ID	Original Area Sq. Inches	Reduced Area Sq. Inches	Reduction in Area %	Modulus of Elasticity	Yield Strength PSI	Tensile Strength PSI	Elongation (2.0" Gage Length) in.	Elongation (2.0" Gage Length) %
Z1	0.1963	0.1041	47.0	28.4 Msi	41500	92900	1.11	55.0
Z2	0.1893	0.1012	46.5	27.7 Msi	37700	84400	1.04	52.0
Z3	0.1909	0.1052	44.9	25.9 Msi	37100	83700	1.34	67.0

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.

Karl Schmitz, Director
Materials Testing

KS/kss

C-5 Coil Weld Map – Metal Tek

Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches

Defect Number	Drawing View	Length (inches)	Width (inches)	Depth (inches)
1	Right	8	7	3
2	Right	23	16	3
3	Right	3	3	2
4	Right	7 ½	5	2
5	Right	24	13	¾
6	Left	9	2	Thru
7	Left	21	4	Thru
8	Left	16	1 ½	¾
9	Left	14	9	1 ¼
10	Left	7	4	Thru
11	Right	7 ½	4	Thru
12	Right	10 ½	1 ½	¾
13	Right	6	4	1 ¼
14	Right	5	1 ¾	1 ½
15	Right	4	4	Thru
16	Right	4	2	Thru
17	Right	6	4	1
18	Right	12	4	Thru
19	Right	18	4	2
20	Right	15	2	2
21	Right	14	3	¾
22	Right	16	6	1
23	Right	5 ¼	4	¾
24	Right	7	4	¼
25	Right	6	4	3
26	Right	9	3	1 ½
27	Right	3	2	1 ½
28	Right	4	5	1
29	Right	4	3	1 ¼
30	Right	6	5 ½	¾
31	Right	10	7	Thru
32	Right	2	2	1
33	Bottom	4	2 ½	2
34	Bottom	5 ½	2	2
35	Bottom	11	4	¾

C-5 Coil Weld Map – Metal Tek

Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches

Defect Number	Drawing View	Length (inches)	Width (inches)	Depth (inches)
36	Back	7	3	1 ½
37	Back	4	3	2
38	Back	16	4	1
39	Back	9	4 ¼	¾
40	Back	5	5	¾
41	Back	5	1 ½	1 ½
42	Back	22 ½	1	¾
43	Back	5	3	1
44	Back	7	3	1
45	Front	4	2	Thru
46	Front	7 ½	3	2
47	Left	31	12	1
48	Left	32 ¾	6	¾
49	Left	18	1	¼
50	Left	14	7	1
51	Left	17	1	Thru
52	Left	7	5 ½	¾
53	Left	21	6	3
54	Left	9	1 ½	¼
55	Left	13	4	Thru
56	Left	9	2 ½	1 ½
57	Left	6	6	Thru
58	Left	2	2	2
59	Left	10	6	1
60	Left	22	8	1
61	Left	24	1 ½	¾
62	Left	28	3	2
63	Left	15	4 ½	1
64	Left	21	7	1
65	Left	3	2 ½	2 ½
66	Left	13	5	Thru
67	Left	4	4	2 ½
68	Left	8	2	1 ½
6	Left	4	4	2
70	Left	15	1	½
71	Left	4	2 ½	3
72	Left	9	4 ½	½

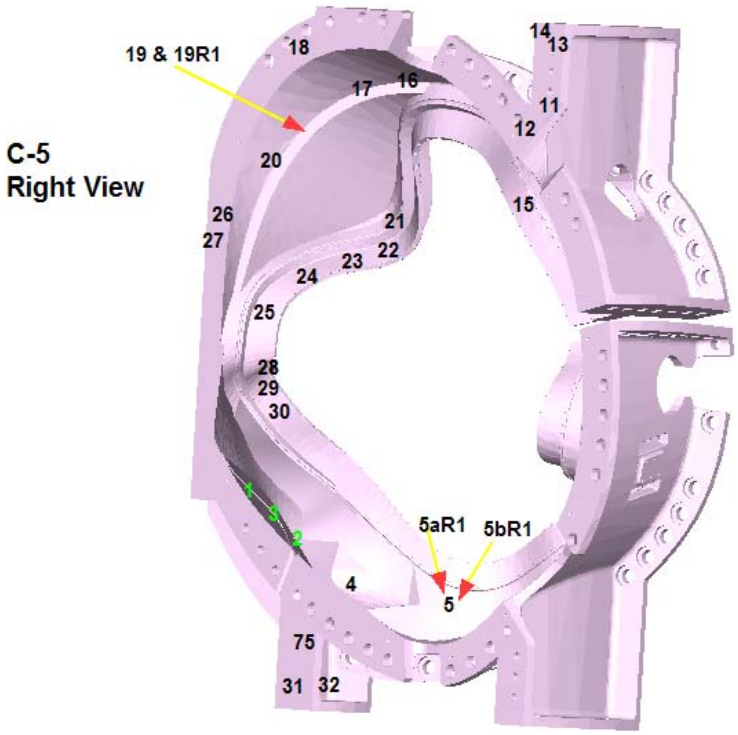
C-5 Coil Weld Map – Metal Tek

Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches

Defect Number	Drawing View	Length (inches)	Width (inches)	Depth (inches)
62r1	Left	4 ¾	3 ¾	½
73	Left	10	1 ½	¾
51aR1	Left	8	4	½
51bR1	Left	7 ½	3 ½	¾
19R1	Right	9 ½	1 ¾	¾
5aR1	Right	5	3	1 ½
5bR1	Right	6 ½	2	1
74	Left	6	3	3
75	Right	3	2 ½	2
76	Top	9	4	3

C-5 Coil Weld Map – Metal Tek

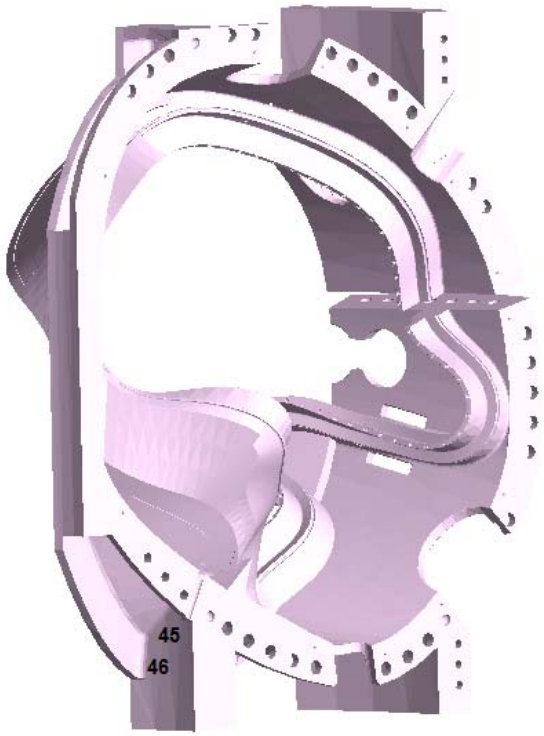
Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches



C-5 Coil Weld Map – Metal Tek

Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches

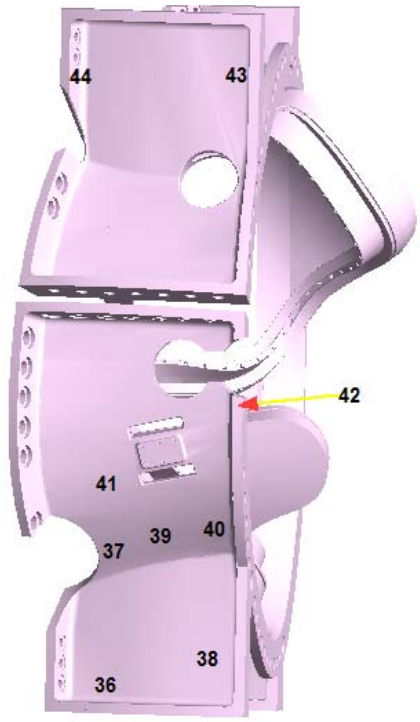
C-5
Front View



C-5 Coil Weld Map – Metal Tek

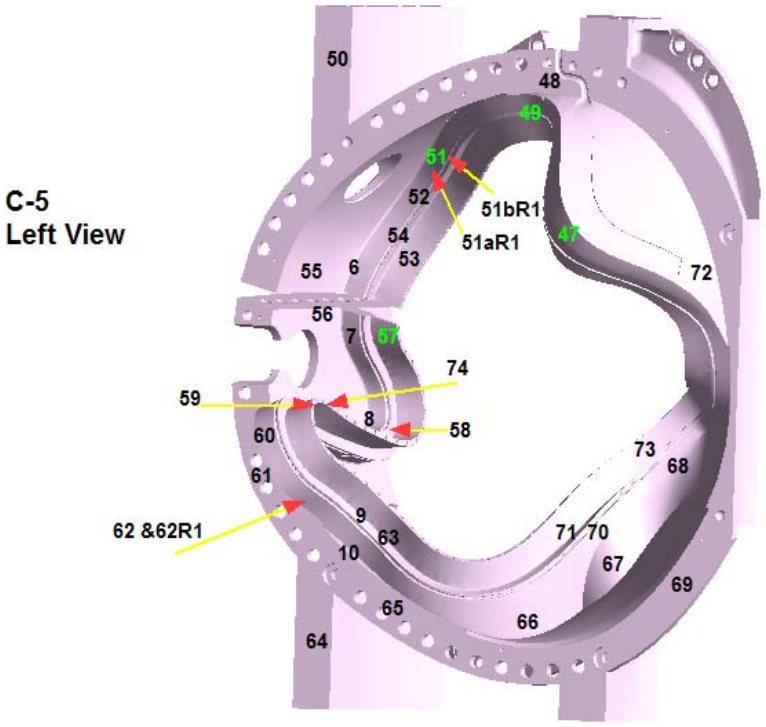
Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches

C-5
Back View



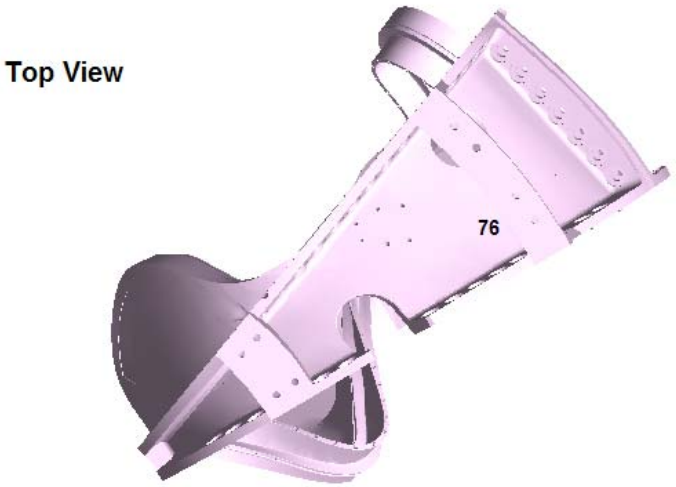
C-5 Coil Weld Map – Metal Tek

Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches



C-5 Coil Weld Map – Metal Tek

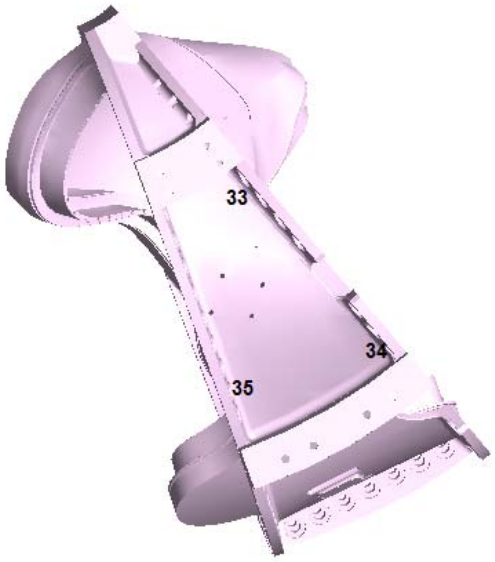
Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches



C-5 Coil Weld Map – Metal Tek

Map of all major welds exceeding 20% of wall, over 1 inch or over 10^2 inches

C-5
Bottom View



MetalTek INTERNATIONAL

RADIOGRAPHIC STANDARD SHOOTING SKETCH

Customer E.I.O.	Pattern Number MCWF-C5
Material CF8MNMN MOD	Traceability Number
Film Manufactuer FUJI	Source Number CO60 22.7 CI
IQI LEVEL 2-2T From CQP 401 X Other (Specify, E.G. 2-4T, 2-1T) N/A	

Exposures (views)	83-84	103-104	104-105	109-110	H-I	X-Y						
Thickness (IN.)	1½ → 3"	2 3/4"	→	→	3" → 6"	→						
S/F Distance (IN.)	20"	→	→	→	→	→						
Penetrameter	30 40 60	50 x2	→	→	60X2 120X2	→						
Time (MIN.)	15min	8Min 30sec	→	16min	1hr 45min	→						
Focal Spot (IN.)	.125	→	→	→	→	→						
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	29 59 80	80X2	→	59/80	29x2 59 80	→						
Acceptance Standard	MSS-SP-54			→	→	→						
Severity Level	See SPEC.			→	→	→						

Shooting Sketch (Use Additional Pages as Needed)

Technique Prepared By: RonKelley Level: II Date: 11-7-05

Technique Approved By: _____ Level: _____ Date: _____

Metal Tek INTERNATIONAL

RADIOGRAPHIC STANDARD SHOOTING SKETCH

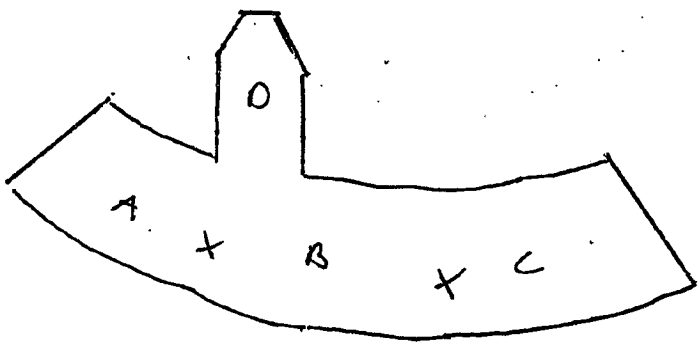
Customer	Energy Industries of Ohio	Pattern Number	SE-141-073 c shim
Material	CF8MNMN-MOD	Traceability Number	
Film Manufactuer	Fuji	Source Number	Co60 24.7 ci

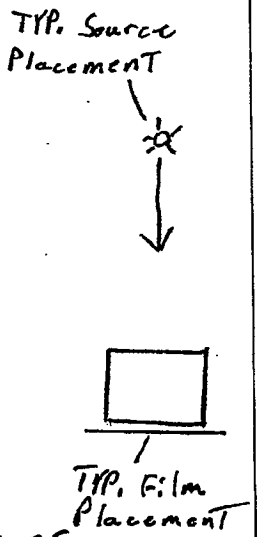
IQI LEVEL 2-2T From CQP 401 X Other (Specify, E.G. 2-4T, 2-1T) N/A

Exposures (views)	A	B	C	D								
Thickness (IN.)	3 7/8"	→	→	→								
S/F Distance (IN.)	24"	→	→	→								
Penetrameter	50	→	→	→								
Time (MIN.)	22min	→	→	→								
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

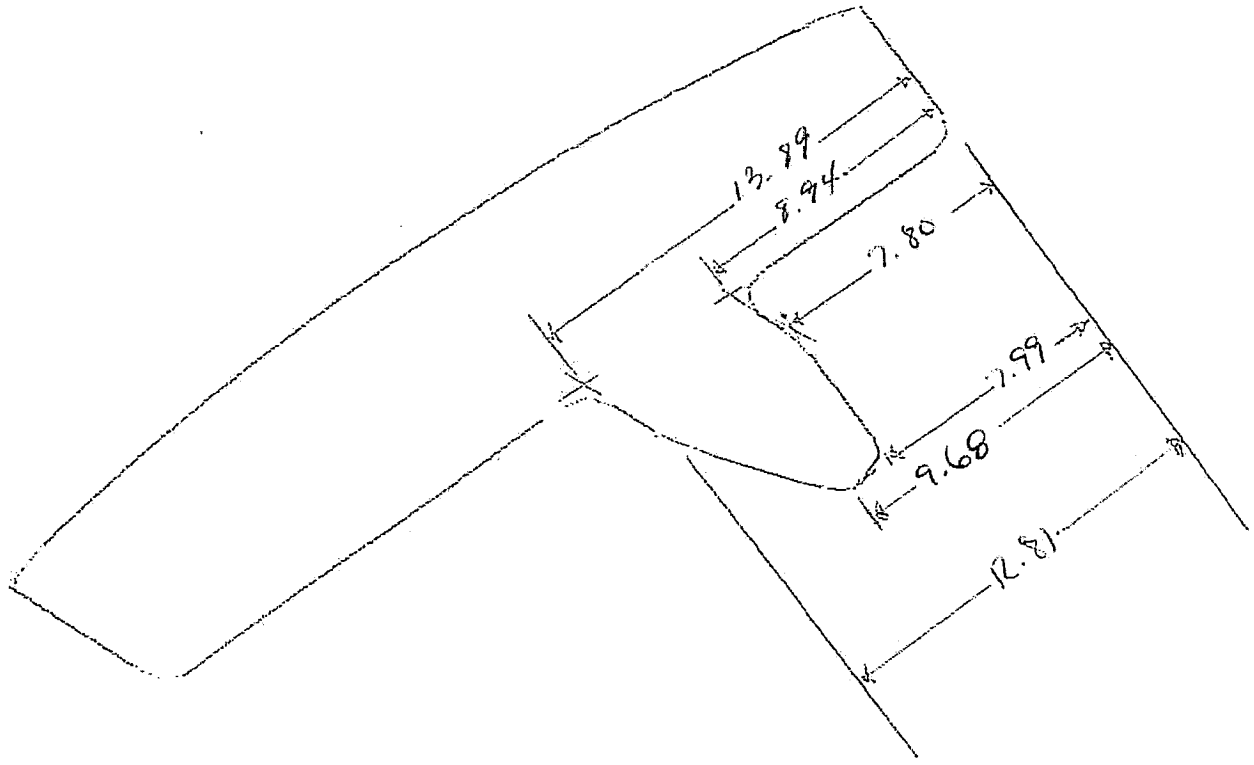




Technique Prepared By: RON Kelley Level: II Date: 9-9-05

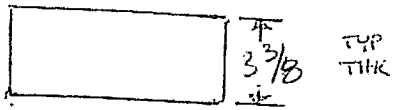
Technique Approved By: RS Level: III Date: 9/10/05

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

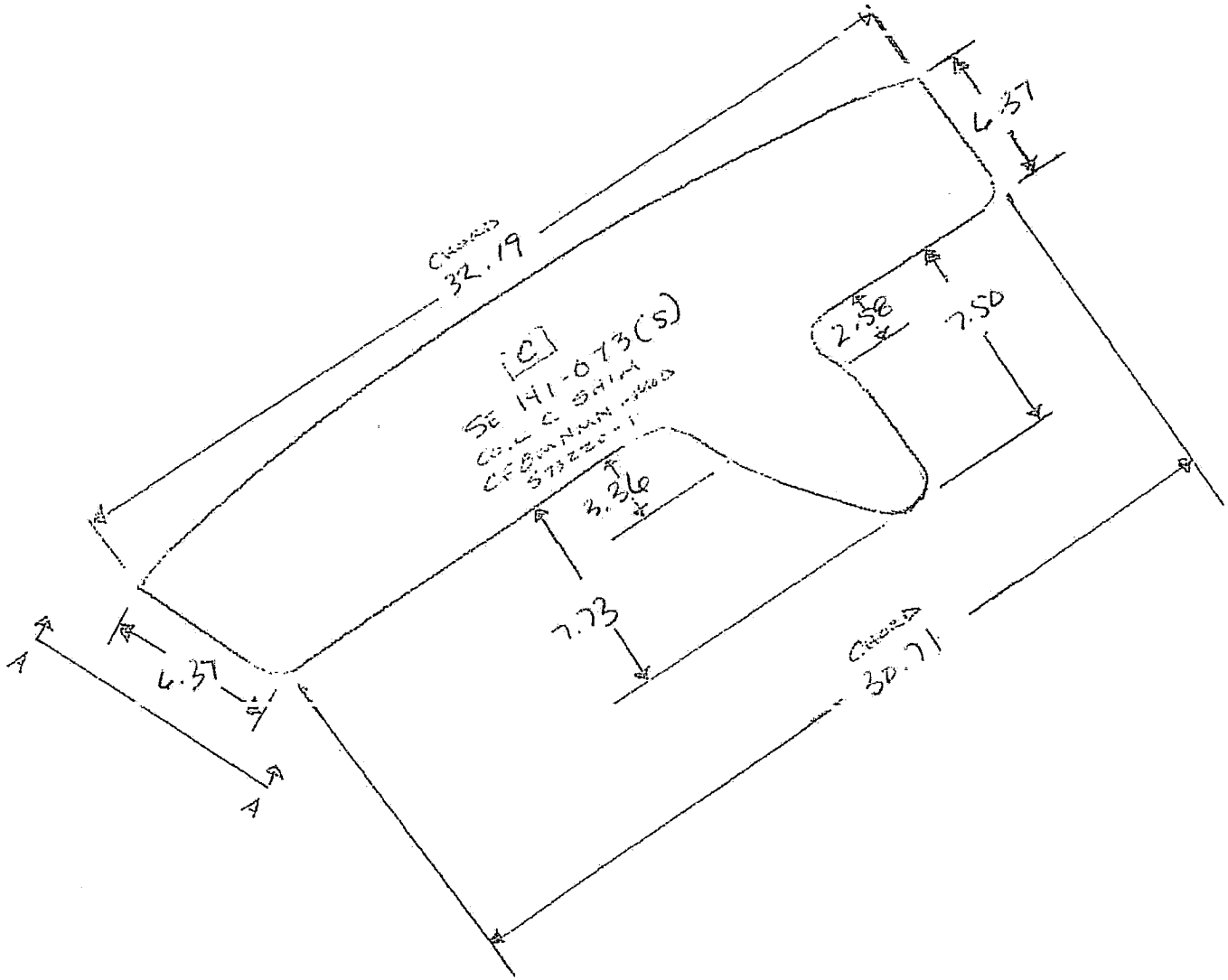


PAGE 2 OF 2.

SHIM SE 141-073 (5)



SECT A-A



HIM SE 141-073
SKETCH 9/12/05

PAGE 1 OF -2

TEAM COOPERHEAT-MQS, INC.

CERTIFIED RADIOGRAPHIC INSPECTION REPORT

FORM 6061-RT- 002 Rev.2

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

CUSTOMER

NAME METAL TEK INTERNATIONAL

ADDRESS 8600 COMMERCIAL BLVD

CITY PEVELY STATE MO ZIP 63070

DATE 8/31/2005

WORK ORDER NO. 361-02500-1

P.O. NUMBER 21818

XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999

SHEET ____ OF ____

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	No Apparent Indications: Rejected	Dross or Slag Inclusion	Incomplete Penetration: Porosity	Incomplete Penetration: Lack of Fusion	Shrinkage: Gas Cracks	Shrinkage: Hot Tears	Shrinkage: Undercut	Film Artifacts: Surface	REMARKS
MCWF-C-5		1-2		R				4-5				
		2-3	✓					2-3				
E.I.O. C040851		3-4	✓					2				
		4-5		R				4-5				
MS172810		5-6		R				4				
		7-8	✓								✓	
		8-9	✓						1-2			
		9-10	✓								✓	
		11-12	✓									
		12-13	✓									
		13-14	✓		2							
		15-16	✓					3				
		16-17	✓					2				
		18-19	✓									
		19-20	✓									
		20-21	✓					12				
		21-22		R				4				
		23-24	✓									
		24-25	✓					3				
		26-27	✓									
		27-28	✓									
		29-30	✓								✓	
		30-31	✓								✓	
		32-33	✓					2				
		33-34	✓					1			✓	

NO. ACCEPTED 0 NO. REJECTED 1

MQS TECH. NO. 12970 SHT. REV. 1

CUST. RSS NO. SHT. REV.

COMMENTS

REVIEWER John Petroske

CERTIFIED NDT LEVEL (RT)

John Petroske RT II Exp. 01/08

TEAM COOPERHEAT-MQS, INC.

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FORM 6061-RT- 002 Rev.2

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XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999

SHEET ____ OF ____

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	Rejected	Inclusion	Dross or Slag	Incomplete Penetration: Porosity	Lack of Fusion	Shrinkage: Gas	Cracks	Hot Tears	Under cut	Film Artifacts: Surface		REMARKS
MCWF-C-5		35-36	✓										✓		
		36-37			R	5				R					
E.I.O. C040851		38-39	✓											✓	
		39-40	✓						1				✓	✓	
MS172810		41-42			R				3-4		R		✓		
		42-43			R						R		✓		
		44-45			R				3						
		45-46	✓			1							✓		
		47-48			R				3-4		R		✓		
		48-49			R				4		R		✓		
	49	50-51			R				3-4		R		✓		
		52-53			R						4				
		53-54	✓												
		54-55	✓												
		55-56	✓												
		56-57	✓												
		57-58	✓												
		58-59	✓			1									
		59-60	✓			1			2						
		60-61	✓						2				✓		
		62-63	✓						2						
		63-64	✓												
		65-66	✓												
		67-68	✓								2				
		68-69	✓								3				

NO. ACCEPTED 9 NO. REJECTED 1

MQS TECH. NO. 12970 SHT. REV. 1

CUST. RSS NO. SHT. REV.

COMMENTS V64 not included. This view was only shot for a dig out in this Area on Previous Castings.

REVIEWER John Petroske

CERTIFIED NDT LEVEL (RT)

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TEAM COOPERHEAT-MQS, INC.

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PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999

SHEET ____ OF ____

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	Rejected	Dross or Slag Inclusion	Incomplete Penetration: Porosity	Lack of Fusion	Shrinkage: Gas Cracks	Hot Tears	Under cut	Film Artifacts: Surface		REMARKS
MCWF-C-5		69-70	✓								✓		
		71-72	✓					2-3					
E.I.O. C040851		72-73	✓					2					
		73-74	✓								✓	✓	
MS172810		74-75	✓										
		75-76	✓								✓		
		76-77	✓					1			✓		
		78-79	✓					2					
		79-80	✓								✓		
		80-81	✓					3			✓		
		81-82		R				3-4	R				
		83-84		R				3			✓		
		85-86		R				3-4					
		86-87	✓									✓	
		87-88		R				2	R		✓		
		88-89		R					R				
		90-91		R				5			✓		
		92-93		R				5			✓		
		V94	✓								✓		
		V95	✓								✓	✓	
		96-97		R	R						✓		
		97-98		R					R				
		98-99	✓									✓	
	100-101		✓								✓		
	101-102		✓										

NO. ACCEPTED 4

NO. REJECTED 1

MQS TECH. NO. 12970 SHT. REV. 1

CUST. RSS NO. SHT. REV.

COMMENTS

REVIEWER John Petroske

CERTIFIED NDT LEVEL (RT)

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P.O. NUMBER 21818

XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999

SHEET ____ OF ____

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	Rejected	Dross or Slag Inclusion	Incomplete Penetration: Porosity	Lack of Fusion	Gas Cracks	Shrinkage: Hot Tears	Under cut	Film Artifacts: Surface		REMARKS
MCWF-C-5	102-103		✓										
	103-104			R					R				
E.I.O. C040851	104-105			R	5				R				
	106-107			R					R				
MS172810	107-108		✓								✓		
	108-109			R					R				
	109-110			R	5				R				
	111-112		✓										
	112-113			R	5								
	114-115		✓										
	115-116		✓										
	116-117			R					R				

NO. ACCEPTED 0 NO. REJECTED 1

MQS TECH. NO. 12970 SHT. REV. 1

CUST. RSS NO. SHT. REV.

COMMENTS

REVIEWER John Petroske

CERTIFIED NDT LEVEL (RT)

John Petroske RT II Exp. 01/08

TEAM COOPERHEAT-MQS, INC.

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CITY PEVELY STATE MO ZIP 63070

DATE 8/31/2005

WORK ORDER NO. 361-02500-1

P.O. NUMBER 21818

XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999

SHEET ____ OF ____

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	No Apparent Indications: Rejected	Dross Inclusion	Dross or Slag	Incomplete Penetration: Porosity	Lack of Fusion	Shrinkage: Gas	Shrinkage: Cracks	Hot Tears	Under cut	Film Artifacts: Surface		REMARKS
MCWF-C-5		A-B		R					5						
		B-C		R					5						
E.I.O. C040851		C-D		R					5						
		D-E	✓						2						
MS172810		E-F	✓										✓		
		F-G	✓						3						
		G-H		R					5						
		H-I		R					5						
		I-J		R					5						
		J-K	✓						3						
		K-L		R					3		R				
		L-M		R					3		R				
		M-N		R					5						
		N-O	✓						3						
		O-P	✓						2						
		P-Q	✓						2						
		Q-R	✓						3						
		R-S	✓						1						
		S-T	✓												
		T-U	✓												
		U-V	✓						2-3						
		V-W		R					6						
		W-X		R					5						
		X-Y		R					5						
		Y-Z		R					4-5				✓		

NO. ACCEPTED 0 NO. REJECTED 1

MQS TECH. NO. 12970 SHT. REV. 1

CUST. RSS NO. SHT. REV.

COMMENTS

REVIEWER John Petroske

CERTIFIED NDT LEVEL (RT)

John Petroske RT II Exp. 01/08

TEAM COOPERHEAT-MQS, INC.

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DATE 8/31/2005

WORK ORDER NO. 361-02500-1

P.O. NUMBER 21818

XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999

SHEET ____ OF ____

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	Rejected	Dross Inclusion	Dross or Slag	Incomplete Penetration: Porosity	Lack of Fusion	Shrinkage: Gas	Cracks	Hot Tears	Under cut	Surface	Film Artifacts	REMARKS
MCWF-C-5		Z-AA		R					5						
		BB		R					5						
E.I.O. C040851		CC-DD		R					5						
		DD-AA		R					5						
MS172810															

NO. ACCEPTED 4 NO. REJECTED 1

COMMENTS

MQS TECH. NO. 12970 SHT. REV. 1

CUST. RSS NO. SHT. REV.

REVIEWER John Petroske

CERTIFIED NDT LEVEL (RT)

John Petroske RT II Exp. 01/08

TEAM COOPERHEAT-MQS, INC.

CERTIFIED RADIOGRAPHIC INSPECTION REPORT

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CUSTOMER

NAME METAL TEK INTERNATIONAL

ADDRESS 8600 COMMERCIAL BLVD

CITY PEVELY STATE MO ZIP 63070

DATE 10/13/2005

P.O. NUMBER

WORK ORDER NO. 361-02646

XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999

SHEET ____ OF ____

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	Rejected	Incomplete Penetration: Inclusion	Dross or Slag	Porosity	Lack of Fusion	Shrinkage: Gas	Cracks	Hot Tears	Under cut	Film Artifacts: Surface		REMARKS
MCWF-C5	5	1-2	✓			1-2					1-2				
	21	4-5	✓											✓	
E.I.O. C040851		5-6	✓								2				
		21-22	✓												
M172810		36-37	✓												
		41-42	✓								1-2		✓		
		42-43	✓										✓		
		44-45	✓								2		✓	✓	
		47-48	✓								1		✓	✓	
		48-49	✓												
	49	50-51	✓								2				
		52-53	✓										✓	✓	
		81-82	✓		1-2								✓	✓	
		83-84		R						4					
		85-86	✓		1-2								✓	✓	
		87-88	✓										✓		
		88-89	✓							1					
		90-91	✓										✓		
		92-93	✓						1-2				✓		
		96-97	✓												
		97-98	✓		1-2										
	103	104		R								IR			
	104	105		R								R	✓		
	106	107	✓												
	108	109	✓										✓		

NO. ACCEPTED ϕ NO. REJECTED 1

COMMENTS

MQS TECH. NO. 12970 SHT. REV.

CUST. RSS NO. SHT. REV.

REVIEWER

CERTIFIED NDT LEVEL (RT)

John Petroske RT II Exp. 01/08

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DATE 10/13/2005

WORK ORDER NO. 361-02646

P.O. NUMBER

XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999

SHEET ____ OF ____

PART NUMBER	Serial No	View	No Apparent Indications: Accep-table	Rejected	Dross Inclusion	Dross or Slag	Incomplete Penetration: Porosity	Lack of Fusion	Shrinkage: Gas	Cracks	Hot Tears	Under cut	Film Artifacts: Surface		REMARKS
MCWF-C5	5 109-110			R							R				
R1	112-113		✓										✓	✓	
E.I.O. C040851	116-117		✓								1				
M172810															

NO. ACCEPTED Ø

NO. REJECTED 1

COMMENTS

MQS TECH. NO. 12970 SHT. REV.

CUST. RSS NO. SHT. REV.

REVIEWER John Petroske

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DATE 10/13/2005

WORK ORDER NO. 361-02646

P.O. NUMBER

XRAY X

GAMMA

PROCEDURE SPECIFICATION ASTM E94-93

ACCEPTANCE CRITERIA MSS-SP-54-1999

SHEET ____ OF ____

PART NUMBER	Serial No	View	No Apparent Indications: Acceptable	Rejected	Inclusion	Dross or Slag	Porosity	Incomplete Penetration: Lack of Fusion	Shrinkage: Gas Cracks	Hot Tears	Under cut	Film Artifacts: Surface		REMARKS
MCWF-C5	5	A-B	✓							2				
	R1	B-C	✓											
E.I.O. C040851		C-D	✓							2-3				
		G-H	✓											
M172810		H-I		R							4-5		✓	See 83-84
		I-J	✓							J				
		K-L	✓							2-3				
		L-M	✓							1-2				
		M-N	✓							1				
		V-W	✓							2				
		W-X	✓							2				
		Y-Z	✓										✓	
		X-Y		R						4-5			✓	
		Z-AA	✓											
		BB	✓											
	CC	DD	✓							1		✓		
	DD	A	✓							1				

NO. ACCEPTED Ø NO. REJECTED 1

MQS TECH. NO. 12970 SHT. REV.

CUST. RSS NO. SHT. REV.

COMMENTS

V-W, WX There is Room for only 1 12apeue In These Views

REVIEWER John Petroske

CERTIFIED NDT LEVEL (RT)

John Petroske RT II Exp. 01/08

MetalTek INTERNATIONAL

RADIOGRAPHIC INTERPRETATION REPORT

CUSTOMER	PURCHASE ORDER NUMBER	DATE	CONTROL NO.	PAGE
E.I.O	PPPL-FP-LTS-2	11-7-05	40851	1 OF 1

PART NO.	SPECIFICATION	CLASS	TOTAL PIECES	PIECES ACCEPTED
MCWFC-5	E446/E186	see spec	1	1

RADIOGRAPHED BY:	INTERPRETED BY:	ASNT LEVEL
Midgett/Kelley	Mon Kelley	II

FILM TYPE	MATERIAL	ISOTOPE	CODE
29/59/80	CF8MNMW MOD	IRIDIUM 192 COBALT 60 ✓	ASTM E94 ✓ ASME MIL-STD-453

M172810

VIEW	PENE	ACCEPT	REJECT	SHRINK	INCLUSION	POROSITY	LINEAR	SURFACE	LOF/LOP	COMMENTS
R2	83-84	30 60 40	✓				2			
	103-104	50	✓			1	1		✓	
	104-105	↓	✓		1	1			✓	
	109-110	↓		X						X
	H-I	60/120	✓		2	1				
	Y-Y	↓		X	X					
R3	109-110	50	✓			1	1		✓	
	X-Y	60/120	✓			1	1		✓	

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

FORM CC034

4

MetalTek INTERNATIONAL

RADIOGRAPHIC INTERPRETATION REPORT

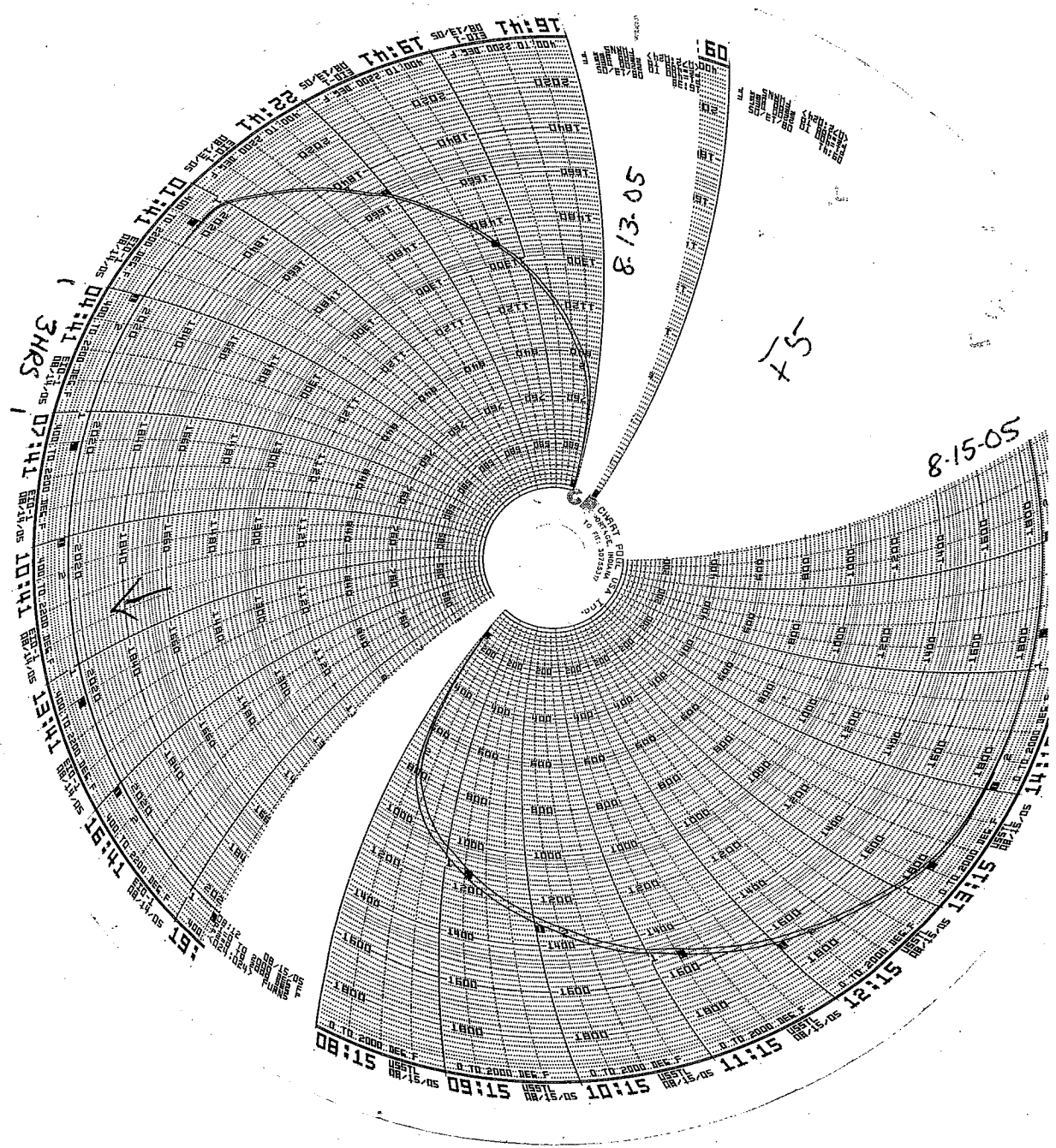
CUSTOMER	PURCHASE ORDER NUMBER	DATE	CONTROL NO.	PAGE
E.I.O.	PPPL-FP-LTS-2	11-8-05	40851	1 of 1

PART NO.	SPECIFICATION	CLASS	TOTAL PIECES	PIECES ACCEPTED
SE-141-073-5	E186	See Spec	1	1

RADIOGRAPHED BY:	INTERPRETED BY:	ASNT LEVEL
Kelley	Kelley	II

FILM TYPE	MATERIAL	ISOTOPE	CODE
80	CFBMNMN MOD	IRIDIUM 192 COBALT 60 ✓	ASTM E94 ✓ ASME MIL-STD-453

	VIEW	PENE	ACCEPT	REJECT	SHRINK	INCLUSION	POROSITY	LINEAR	SURFACE	LOF/LOP	COMMENTS
NS73220-2											
Shim 5	A	50	✓						✓		
	B	↓	✓		1	1			✓		
	C		✓								
	D		✓			1					



E10 8-13-05

MCWF-C5 COIL

172810-1

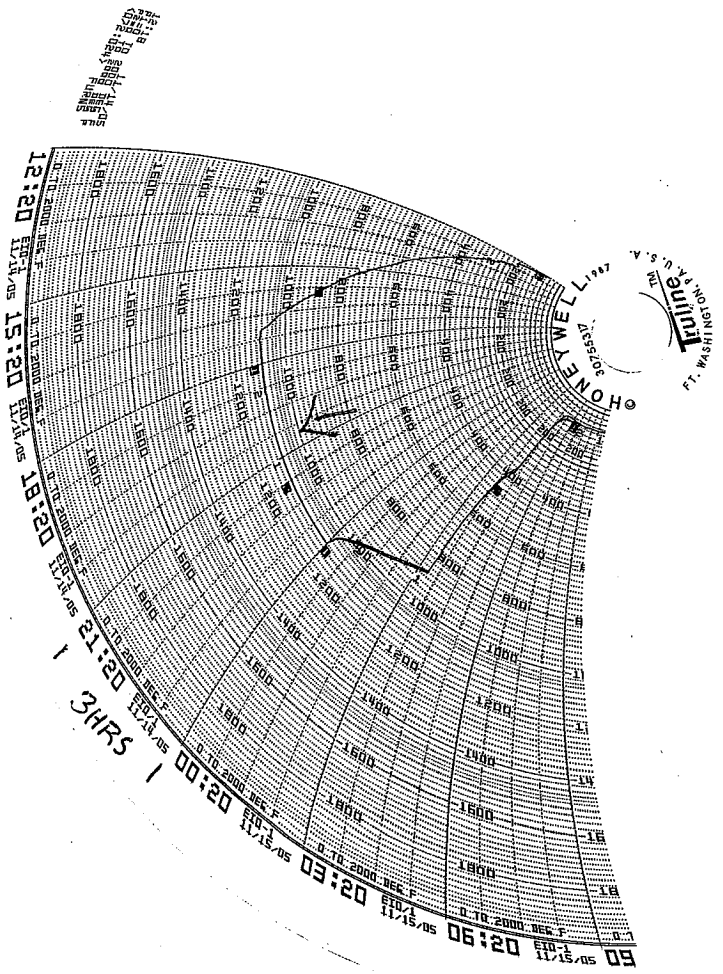
1 Pc.

E10 11-14-05

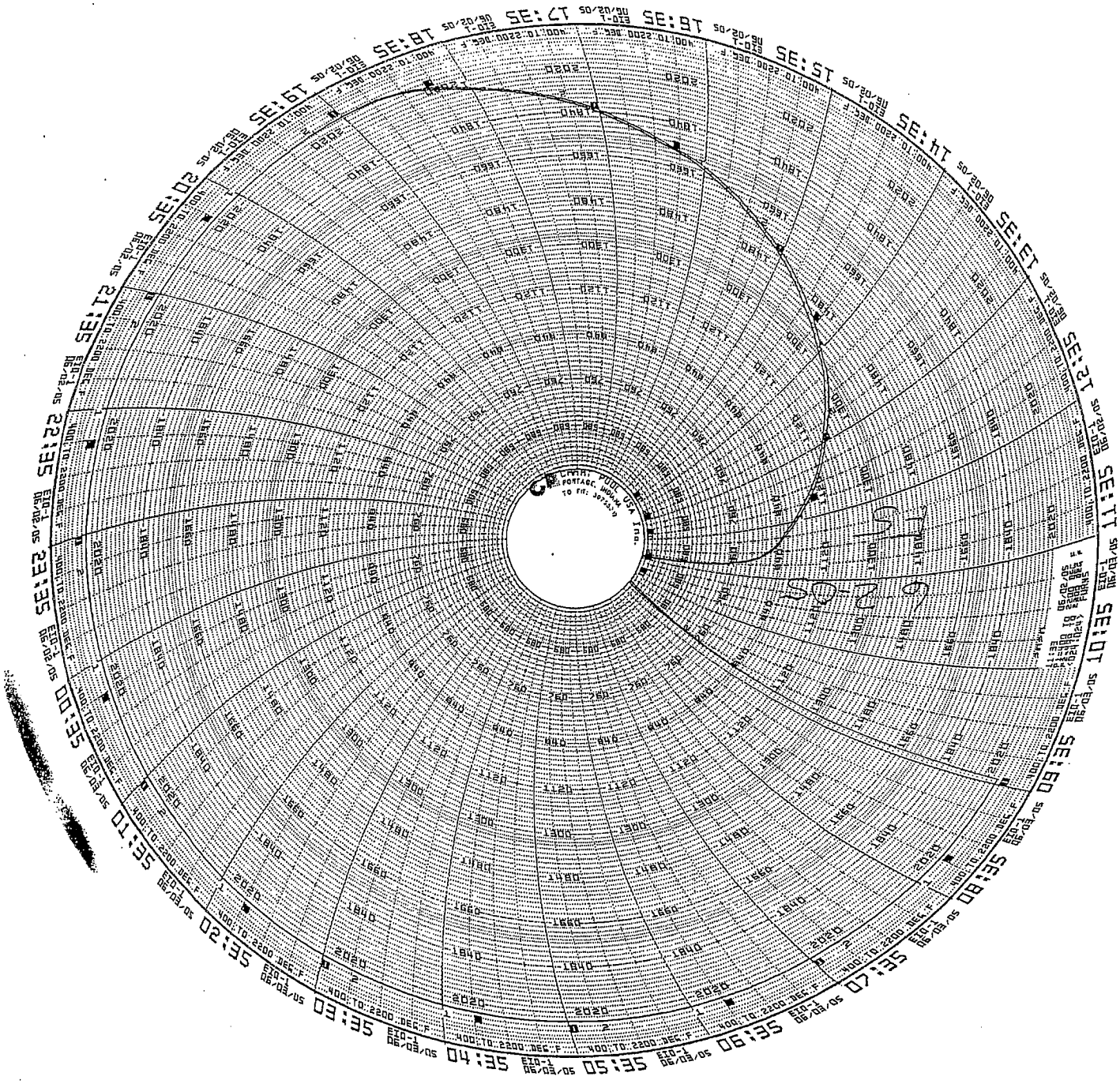
MCWF-C5 COIL

172810-1

1 Pc.



A + C Shims CAL



Energy Industries of Ohio
Manufacturing and Test Sequence (MTS) Serial Number C-5 Coil
1 OF 11 **CO# 40851 Dated 3-9-05 Revision: Rev 8 Dated Issued:7-29-05**

OPER. #	STATION	DESCRIPTION OF PROCESS	Name	Date
10	QUALITY RELEASE	REVIEW AND APPROVE MTS. RECEIVED APPROVAL FROM EIO ON _8-3-05 FROM _Pete D._ SIGNED QUALITY MANAGER		
15	PATTERN NPAT SOP 0100REV2	APPLY APPROPRIATE PART NUMBER, SERIAL NUMBER, AND FOUNDRY MARK, TO THE PATTERN. CAST ON TEST BARS AND CAST ON BLOCKS (extra 3"x3"x1" specimens) REQUIRED, ID AS TO COIL NUMBER AND ZONE LOCATION.	KM	8/3
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.	BC	8/4/05
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.	BC	8/8/05
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: 2745 CASTING POURED AT: 330 pm DATE: 8/08/05 HEAT #"s: 30441, 30445 ELAPSED POUR TIME 25 min KEEL BLOCKS POURED: NA Sample from ladle to be analyzed for final chemical analysis and reported on material certifications. Sample Taken by: T Wilson Analyzed: G. Hunt Date: 8/8	JWG	8/9/05
50	MELT SOP 0800R2	SHAKEOUT	CA	8/11

60	ARC RISE SOP 0100R1	REMOVE RISERS AS DIRECTED BY SUPERVISOR.	JC	8/19
70	HEAT TREAT HEAT SOP 0103R5	SOLUTION ANNEAL. MAKE SURE TO BLOCK ALL FLANGES OF FORM AND RACETRACK TO MINIMIZE CREEP DISTORTION. Soak Temp: 2050F, Soak Time: 4HR + 1/2 HR/IN, Quench Type: Air Cool MAKE SURE TEST MATERIAL IS PLACED IN THE CORRECT ZONE.	RJ	8/14/05
75	PHYSICAL TESTING	OBTAIN TEST SPECIMENS AND SUBMIT FOR PHYSICAL TESTING. REPORT RESULTS AS PART OF STEP 510.	WH	8/15/05
NOTE		**THE ORDER OF CLEANING PROCESSES MAY BE ALTERED DUE TO CAPACITY CONSTRAINTS. HOLD POINTS AND COMPLIANCE WILL NOT BE COMPROMISED. EIO WILL BE ADVISED OF ALL CHANGES THAT MAY RESULT IN A REQUEST FOR DEVIATION FROM REQUIREMENTS.**		
80	GRIND GSWA SOP 0100R3	SWING GRIND TO REMOVE RISER REMAINS AND FLASH IF REQUIRED.	JLC	8/16/05
85	GRIND GCHI SOP 0100R2	CHIP AND HAD GRIND SURFACE OF PART AS REQUIRED FOR CONTOUR.	CAK	8/22/05
90	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.	MTW	8/23/05
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF LAYOUT. EIO NOTIFIED ON 11/1 DCMA NOTIFIED ON 11/1 APPROVAL RECEIVED ON NA	Q ENG OR QA MGR	Chr
100	INTERIM LAYOUT SOP LAYOUT 0100	INSPECT CASTING TO VERIFY DIMENSIONS. THIS STEP MAY BE DELAYED UNTIL ALL REPAIRS ARE COMPLETE. NOTE: THE FIRST PART PRODUCED OF EACH TYPE A, B AND C WILL BE DIMENSIONED BY LAWTON PATTERN. IF DIMENSIONED BY LAWTON IT WILL BE DOCUMENTED HERE. Subsequent casting done internally per Romer Arm.	Jody	11/8/05
110	INTERIM VISUAL INSPECTION CQP-500 REV 4	VISUALLY INSPECT 100% of COMPONENT ACCORDING TO ASTM A802 LEVEL 3 IN NON MACHINED AREAS AND LEVEL 2 IN MACHINED AREAS. IF OK CHECK HERE _____ . IF REJECTED CHECK HERE ____ . MARK AND REPAIR AT STEP 120.	VT - LEVEL II	NA
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF LP STEP. EIO NOTIFIED ON _____ DCMA NOTIFIED ON _____	Q ENG OR QA MGR	

VIS + 2PI delayed tab after RT Chr

N A

115	INTERIM 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 _____ MARK AND REPAIR AT STEP 120.	LP - LEVEL II	
120	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING 100% VISUAL AND LP INSPECTION.		
125	GRIND GCHI SOP 0100R2	CHIP AND HAND GRIND EXCAVATION AS REQUIRED.		
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. IF OK CHECK HERE _____ IF REJECTED SEND BACK TO STEP 125.	LP - LEVEL II	
165	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.		
170	WELD MAP	MAP ALL MAJOR WELDS WITH DIGITAL PHOTO/MAPS INDICATING LOCATION. 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 INDICATE ON MAP ALL MAJOR WELDS, DEFINED AS GREATER THAN 20% OF THE WALL OR 1 INCH WHICHEVER IS LESS OR 10 SQUARE INCHES APPROXIMATLY 3.3"X3.3".		
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF X-RAY AND DIMENSIONAL STEPS. EIO NOTIFIED ON 8/23/05 DCMA NOTIFIED ON 8/23/05	Q ENG OR QA MGR	RMS
190	X-RAY AT MQS MQS PROCEDURE 20.H.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 8/27/05	RMS
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 260. REJECTED CHECK HERE _____ MARK UP DEFECTS AND SEND THE CASTING TO STEP 220.	RT – LEVEL II 9/14 DH	DCMA STAMP 9/14/05

220	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING RADIOGRAPHY.	CA	
225	GRIND GCHI SOP 0100R2	CHIP AND HAND GRIND EXCAVATION AS REQUIRED.	CA	9/14
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. IF OK CHECK HERE _____ IF REJECTED SEND BACK TO STEP 225.	LP - LEVEL II TRC	9/14/05
240	WELD MAP	MAP ALL WELDS WITH DIGITAL PHOTO/MAPS INDICATING LOCATION. 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 INDICATE ON MAP ALL MAJOR WELDS, DEFINED AS GREATER THAN 20% OF THE WALL OR 1 INCH WHICHEVER IS LESS OR 10 SQUARE INCHES APPROXIMATLY 3.3"X3.3".	✓ JR	
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF WELD STEP. EIO NOTIFIED ON ✓ DCMA NOTIFIED ON 9/14/05	Q ENG OR QA MGR	RMS
260	QA APPROVAL HOLD POINT	QA TO APPROVE ELECTRODE PRIOR TO USE Rev 1 3018513/78308 PROCEDURE USED: 15GMAW CF8MnMnMod MATERIAL/LOT USED: 3018926/78309 QUALITY ENG. Name: CA for CA Date: 10/6/05		
270	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1(Flat) or 25 SMAW-CF8MNMN MOD REV 0 (Vertical) FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2	TLS 10/6/05 TAD 10/25/05	
280	GRIND GCHI SOP 0100R2	HAND GRIND WELDS.	DWP KLB 10/19/05	
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 _____	LP - LEVEL II JR Repair Coup	
	REPEAT	REPEAT STEPS 220 TO 290 AS REQUIRED TILL CLEAR THROUGH VISUAL INSPECTION & PENETRANT INSPECTION. DOCUMENT REWORK ON STEPS S220 TO S290. IF OK CHECK HERE _____ AND PROCEED TO STEP 295.		

			1ST	2ND	3RD	4TH	5TH	
	REPEAT STEPS	SUPPLEMENTAL REPAIR STEPS RT	10/31/05 RKS	11/9 KJ	11-8-05 Accept RK			DCMA STAMP
S220	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING RADIOGRAPHY.	TS 11-9					

NA

S230	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				
S240	WELD MAP	MAP ALL MAJOR WELDS WITH DIGITAL PHOTO/MAPS INDICATING LOCATION. 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 INDICATE ON MAP ALL MAJOR WELDS, DEFINED AS GREATER THAN 20% OF THE WALL OR 1 INCH WHICHEVER IS LESS OR 10 SQUARE INCHES APPROXIMATLY 3.3"X3.3".					
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF WELD STEP. EIO NOTIFIED ON _____ DCMA NOTIFIED ON _____	Q ENG OR QA MGR				
S260	QA APPROVAL HOLD POINT	QA TO APPROVE ELECTRODE PRIOR TO USE. PROCEDURE USED: _____ MATERIAL /LOT USED :_____ QUALITY ENG. Name: _____ Date: _____					
S270	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1(Flat) or 25 SMAW-CF8MNMN MOD REV 0 (Vertical) FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2					
S280	GRIND GCHI SOP 0100R2	HAND GRIND WELDS.			√		
S290	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 S220.	LP - LEVEL II MP	OK 11/8 REJ	OK 11/10 REJ	OK REJ	OK REJ
	REPEAT	REPEAT STEPS S220 TO S290 AS REQUIRED TILL CLEAR THROUGH VISUAL INSPECTION & PENETRANT INSPECTION.	QA ENG.				
295	TEST MAG PERM SOP MAG PERM 100, REV 1	TEST MAG PERMEABILITY REPAIR AREAS TEST AT LEAST 5 POINTS PER WELD. ACCEPTANCE 1.02. IF OK CHECK HERE _____AND GO TO STEP 300. IF REJECTED CHECK HERE _____.			CA	11/8 / 11/10	
296	GRIND GCHI SOP 0100R2	GRIND AREAS OF NON COMPLIANCE AND RETURN TO STEP 295. REPEAT UNTIL COMPLIANCE IS ACHIEVED.			NA		
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			RT done AT CAF CAF	

NA

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		
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		
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		see S220
	REPEAT STEPS	SUPPLEMENTAL REPAIR STEPS	1ST	2ND	3RD	4TH	5TH	
S321	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING RADIOGRAPHY.						
S322	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					
S323	WELD MAP	MAP ALL MAJOR WELDS WITH DIGITAL PHOTO/MAPS INDICATING LOCATION. 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 INDICATE ON MAP ALL MAJOR WELDS, DEFINED AS GREATER THAN 20% OF THE WALL OR 1 INCH WHICHEVER IS LESS OR 10 SQUARE INCHES APPROXIMATLY 3.3"X3.3".						
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF WELD STEP. EIO NOTIFIED ON _____ DCMA NOTIFIED ON _____	Q ENG OR QA MGR					
S324	QA APPROVAL HOLD POINT	QA TO APPROVE ELECTRODE PRIOR TO USE. PROCEDURE USED: _____ MATERIAL /LOT USED :_____ QUALITY ENG. Name: _____ Date: _____						
S325	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1(Flat) or 25 SMAW-						

		CF8MNMN MOD REV 0 (Vertical) FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2					
S326	GRIND GCHI SOP 0100R2	HAND GRIND WELDS. Grind	JR	11/16			
S327	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 S321.	LP - LEVEL II JR	OK REJ	OK REJ	OK REJ	OK REJ
	REPEAT	REPEAT STEPS S321 TO S327 AS REQUIRED TILL CLEAR THROUGH VISUAL INSPECTION & PENETRANT INSPECTION.	QA ENG.	OK Chr			
340	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.		BB	11/16		
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF VISUAL AND LP STEPS. EIO NOTIFIED ON 11/7 DCMA NOTIFIED ON 11/7		Q ENG OR QA MGR	Chr		
350	FINAL VISUAL INSPECTION CQP-500 REV 4	VISUALLY INSPECT 100% of COMPONENT ACCORDING TO ASTM A802 LEVEL 3 IN NON MACHINED AREAS AND LEVEL 2 IN MACHINED AREAS. IF OK CHECK HERE ✓. IF REJECTED CHECK HERE _____. MARK AND REPAIR AT STEP 385. MUST BE PERFORMED BY LEVEL II in VT.		VT - LEVEL II JDR	11/16		
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. IF OK CHECK HERE _____ WASH AND SEND TO STEP 455. IF REJECTED CHECK HERE _____		LP - LEVEL II JDR	11/16		
380	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING FINAL PENETRANT INSPECTION.		NA			
385	GRIND GCHI SOP 0100R2	CHIP AND HAD GRIND EXCAVATION AS REQUIRED.					
390	L.P. EXCAVATION CQP-300 REV 10	L.P. ALL EXCAVATIONS PRIOR TO WELDING TO ENSURE REMOVAL OF DEFECT. ACCEPTANCE PER A903. IF OK CHECK HERE _____ IF REJECTED SEND BACK TO STEP 385.		LP - LEVEL II			

N4

400	WELD MAP	MAP ALL MAJOR WELDS WITH DIGITAL PHOTO/MAPS INDICATING LOCATION. 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 INDICATE ON MAP ALL MAJOR WELDS, DEFINED AS GREATER THAN 20% OF THE WALL OR 1 INCH WHICHEVER IS LESS OR 10 SQUARE INCHES APPROXIMATLY 3.3"X3.3".		
420	QA APPROVAL HOLD POINT	QA TO APPROVE ELECTRODE PRIOR TO USE. PROCEDURE USED: _____ MATERIAL/LOT USED:_____ QUALITY ENG. Name: _____ Date: _____		
430	WELD SOP 0100 REV 7	WELD REPAIR DEFECTS AS MARKED. FOR WELDS <2" - WPS 10-SMAW-CF8MNMN MOD REV 1(Flat) or 25 SMAW-CF8MNMN MOD REV 0 (Vertical) FOR WELDS <8" - WPS 15-GMAW-CF8MNMN MOD REV 2		
440	GRIND GCHI SOP 0100 REV 2	HAND GRIND WELDS.		
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 440.	LP - LEVEL II	
	REPEAT	REPEAT STEPS ___350 TO 450____AS REQUIRED TILL WELDS CLEAR FINAL LIQUID PENETRANT INSPECTION. DOCUMENT REWORK ON A SUPPLEMENTAL MTS	QA ENG.	
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 _____.		
452	GRIND GCHI SOP 0100R2	GRIND AREAS OF NON COMPLIANCE AND RETURN TO STEP 451. REPEAT UNTIL COMPLIANCE IS ACHIEVED.		
455	HEAT TREAT	STRESS RELIEF. Load casting into cold furnace. Ramp up to 1100 F at rate of 200 F per hour. Hold at temp 4 hours. Furnace cool to 500 F at 50 F per hour. Air cool. Submit furnace charts to QA.	KM 12	11/14/05
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF VISUAL AND LP STEPS. EIO NOTIFIED ON 11/7 DCMA NOTIFIED ON 11/7	Q ENG OR QA MGR	

This is a replacement MTS. Original was stained + can't be copied

Energy Industries of Ohio
Manufacturing and Test Sequence (MTS) Serial Number C-5 Coil
9 OF 11 **CO# 40851 Dated 3-9-05 Revision: Rev 8 Dated Issued:7-29-05**

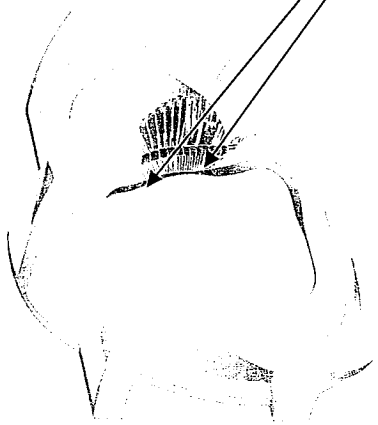
460	FINAL VISUAL INSPECTION CQP-500 REV 4	VISUALLY INSPECT 100% of COMPONENT ACCORDING TO ASTM A802 LEVEL 3 ALL CONDITIONS. IF OK CHECK HERE _____. IF REJECTED CHECK HERE ✓. MARK AND REPAIR AT STEP 390. MUST BE PERFORMED BY LEVEL II in VT.	VT - LEVEL II JDR	11/15 DCMA STAMP
470	FINAL L.P. CQP 0300 REV 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 455. IF REJECTED CHECK HERE ✓. DOCUMENT REPAIRS USING S321 THROUGH S327.	LP - LEVEL II JDR	11/15 DCMA STAMP
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIO AND DCMA AT LEAST FIVE DAYS IN ADVANCE OF MAG PERM STEPS. EIO NOTIFIED ON 11/7 DCMA NOTIFIED ON 11/7	Q ENG OR QA MGR Ctw	
500	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 530. IF REJECTED CHECK HERE _____.	TRC	11/17/05
510	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.	NA	
520	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 510.		
530	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)	Ctw	11/17/05
NOTICE	RELEASE FROM EIO	PROVIDE DOCUMENTS TO EIO. SENT ON 11/21 BY Ctw. RECEIVED RELEASE FROM EIO ON _____.	Q ENG OR QA MGR Ctw	
540	PACK AND SHIP	PACKAGE AND SHIP TO MAJOR TOOL.		
1000	REVISION HISTORY	ORIGINAL 12-14-04. Approved 12-14-04. Revision level 1- Revised 1-26-05 new page 8, correct High stress areas, Revision level 2 3-16-05, delete LO step 455. Revision 3 3-28-05 Added note regarding hold point at weld step 400. Revision level 4 written for C-2 casting 4-18-05. Rev 5 added Layout SOP# and note regarding first casting layout responsibility. 5-10-05. Rev 6 added word LOT to weld material steps. 5-29-05. Rev 7 6-14-05 added "LOT" to weld step on supplement page. Rev. 8 7-29-05 added stress relief, deleted weld hold points, added vertical weld procedure, and several editorial changes.	CARUUD	

original on file AT CAF. Ctw

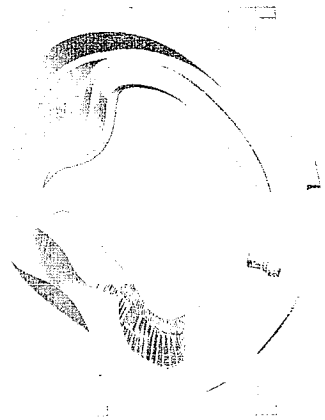
GENERAL ISOMETRIC
VIEW FROM TOP SIDE

TABS DESIGNATE CRITICAL AREA

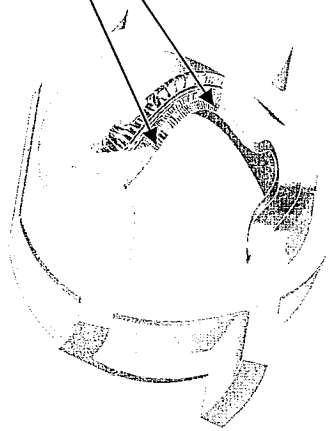
RED AREA INDICATES HIGH STRESSED AREA



TOP SIDE ISOMETRIC



TOP SIDE VIEW



BOTTOM SIDE ISOMETRIC

BOTTOM SIDE VIEW

Energy Industries of Ohio

FIVE PARTS KEEP TOGETHER **Manufacturing and Test Sequence (MTS) Coill C Shim**

CO# 40851, Pattern SE 141-073-5 MS73220-2 Dated December 14, 2004 Revision:Original **Dated Issued:4-27-05**

OPER. #	STATION	DESCRIPTION OF PROCESS Keep all parts together. Sign and date each step when all 5 parts have been completed.	Name	Date
10	QUALITY RELEASE	REVIEW AND APPROVE MTS. RECEIVED APPROVAL FROM EIO ON Pete FROM 12/15 SIGNED QUALITY MANAGER		4/21/05
20	PATTERN NPAT SOP 0100REV2	APPLY APPROPRIATE PART NUMBER, SERIAL NUMBER, FOUNDRY MARK, TO THE PATTERN.	TB	4/22/05
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.	CR	4/22
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: 2825 CASTING POURED AT: 1245hrs DATE: 4/28 HEAT #"s: 29198 ELAPSED POUR TIME 21 KEEL BLOCKS POURED: YES Sample from ladle to be analyzed for final chemical analysis and reported on material certifications. Sample Taken by: SR Analyzed: GH Date: 4/28 **Note: Make 15 additional test bars for mechanical testing.**	JG	4/28/05
50	MELT SOP 0800R2	SHAKEOUT	CA	4/29/05
60	ARC RISE SOP 0100R1	REMOVE RISERS AS DIRECTED BY SUPERVISOR.	BNU	6/16/05
70	HEAT TREAT HEAT SOP 0103R5	SOLUTION ANNEAL. With C-1 Coil.	DLS	6/2/05

80	PHYSICAL TESTING	OBTAIN TEST SPECIMENS AND SUBMIT FOR PHYSICAL TESTING. REPORT RESULTS AS PART OF STEP 480.	N/A	
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. *	CEG 6-1605	
100	SAND BLAST BLAS SOP 0100R6	SANDBLAST (REMOVE ALL BLAST MATERIAL FROM CASTING) SANDBLASTING WILL BE DONE USING RECYCLED SHARP ANGULAR AGGREGATE.		4/17
110	VISUALLY 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	SEE # 320
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF LP STEP. EIO NOTIFIED ON ___11/1___ DCMA NOTIFIED ON ___11/1___	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	N/A
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 ___11/1___ DCMA NOTIFIED ON ___11/1___	Q ENG OR QA MGR	

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 ABK	11-8-05
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. REJECTED CHECK HERE _____ MARK UP DEFECTS AND SEND THE CASTING TO STEP 200.	RT – LEVEL II ABK	11-8-05
190	LAYOUT	INSPECT CASTING TO VERIFY DIMENSIONS. THIS MAY BE PERFORMED BEFORE OR AFTER STEP 180. DIMENSIONED Jony J DATE 9.12-05 RELEASED _____(ENGINEER ONLY)	JJ	9.12-05
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 JPS	11-15-05 Seen Found on #330
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.	NA	
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.		

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.		
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF VISUAL AND LP STEPS. EIO NOTIFIED ON 11/7 DCMA NOTIFIED ON 11/7	Q ENG OR QA MGR	CAZ
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 JR	11/15/05

		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 JPS	11/16/05
340	WELD SOP 0100 REV 7	EXCAVATE ANY DEFECTS FOUND DURING FINAL PENETRANT INSPECTION.	NA	
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.		

420	GRIND GCHI SOP 0100R2	GRIND AREAS OF NON COMPLIANCE AND RETURN TO STEP 420. REPEAT UNTILL COMPLIANCE IS ACHIEVED.	NA	
NOTICE	WITNESS NOTIFICATION	PROVIDE NOTICE TO EIOAND DCMA AT LEAST FIVE DAYS IN ADVANCE OF MAG PERM STEP. EIO NOTIFIED ON 11/1 DCMA NOTIFIED ON 11/1	Q ENG OR QA MGR	CAR
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 _____.	RG	11/16
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.	NA	
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.	CAR	11/17/05
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)	CAR	11/17/05
NOTICE	RELEASE FROM EIO	PROVIDE DOCUMENTS TO EIO. SENT ON 11/4/05 BY CAR. RECEIVED RELEASE FROM EIO ON _____.	Q ENG OR QA MGR	CAR
490	PACK AND SHIP	PACKAGE AND SHIP TO MAJOR TOOL.		
1000	REVISION HISTORY	ORIGINAL 12-14-04.	CARUUD	

Corrective Action 1308
Carondelet Division - CA / PA / RGA Database
Corrective Action Type NCR
Date 6/13/2005
CA Originator C. Ruud
Pattern Number: C and A Coil Shims 11 Pieces

Description of Defect / Non-Conformance
Chemistry for 11 shim castings is out of specification.

Root Cause
Chemistry specification was not changed in system and not communicated to Lab personnel.

Corrective Action
Specification was corrected in system and Lab personnel trained. Mag permeability was checked on the parts and are less than 1.02u.

Verification of Corrective Action
Chemistries were checked on subsequent parts and are within specification.

Preventive Action
Create Inspection and Test Plan summarizing all requirements.

Estimated Completion Date
6/15/05

Actual Completion Date
Complete.

Signed: C. Ruud

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

Nonconformance Report: MetalTek CA 1308

Project Disposition: Use as is.

Approvals

Procurement Technical Representative _____
Wayne Reiersen for Phil Heitzenroeder

Responsible Line Manager _____
Mike Cole for Brad Nelson

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.

MetalTek INTERNATIONAL

Addendum to CA1323 8-17-05

Historical:
The proto type coil was poured on February 24, 2004. The chemistry specification at that time permitted a maximum of 0.04% for sulfur and phosphorus. The reported values for these elements were 0.01 and 0.02% respectively.

Prior to pouring the C-1 coil casting the specification was revised. MT failed to incorporate the revisions into our system. The contract review procedure did not detect the changes to the specification. Therefore normal change procedures were not implemented. This was reported in corrective action 1308 on June 13, 2005. The error was recognized when the material poured to cast C and A coil shims did not meet the revised specification.

An investigation was begun immediately to determine compliance of the C-1 and C-2 coils. It was determined that both the C-1 and C-2 met the revised chemistry, except for sulfur and phosphorus. To verify the analysis MT analyzed samples from the cast on bars taken from the coils. By this time the optical card had malfunctioned. This fact, in combination with the human error (believing that the type standard was also in the 0.002% range) led MT to believe that the sulfur and phosphorus were actually in the 0.002% range. As a result MT believed the coils to be compliant and no action was taken.

Current Activities:
Samples from A-1, C-4 and C-5 have been sent to Wisconsin Centrifugal, our parent company for independent analysis of all reported elements.

Repair to the spectrometer is scheduled for this week. In the mean time we continue our surveillance of the suspect elements during melt and chemistry analysis.

C. Ruud

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

MetalTek INTERNATIONAL

Addendum to CA1323 9-8-05

This is to supplement and report our progress on this corrective action.

As previously committed, samples from A-1, C-4 and C-5 were sent to Wisconsin Centrifugal, our parent company, for independent analysis of all reported elements. The results indicated a discrepancy in the level of manganese in the results of the analyses performed by the two labs. Consistently, the Pevely lab measured Mn about 0.4 to 0.5% higher than WC measured. To confirm this information we sent three samples to an outside laboratory for wet chemistry analysis. The results correlated well with the results achieved at Wisconsin Centrifugal. See attached report.

In follow-up, samples from C-1, C-2 and C-3 were also sent for verification, with similar outcome. We then located and tested a sample from a test heat #21424 of CF8MNMNMOD made in January 2004. Testing indicated similar results.

It can be stated that, for at least the period of time comprising the Prototype and the Production to the repair of the Spectrometer, that our analysis of Manganese levels has been higher than the level actually present in the alloy. Typically, this deviation is on the order of 0.4-0.5%.

The spectrometer received the preventive maintenance on August 29, 2005. The report was submitted on September 2, 2005. The repair made to the optical card was determined to have rectified the previously reported issue with P and S reporting. No other mechanical or software problem that would affect Mn was determined at the time of the preventative maintenance.

In follow up to the Manganese discrepancy, the same samples were analyzed on the Pevely spectrometer. The levels reported after PM now correlate with the results from WC and the independent laboratory. Further investigation indicates that the BS180 standard used for type standardization may be sufficiently outside the range of Mn and inducing error. No other root cause has been determined, but the investigation continues.

In consideration of the erroneous Mn and other elemental readings, the following actions are proposed:

Create a type standard that closely matches the Mn in CF8MNMNMOD. (In process)
Request a revision to the chemistry range for Mn. (propose widening of Manganese since it has been proven to be effective at much lower concentrations than previously thought).
Have each heat of CF8MNMNMOD verified independently for balance of program.

C. Ruud

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

Chemistry Check with WISCO

Lab	I.D.	Sample	C	Si	Mn	Cr	Ni	Mo	N	P	S	
CAF	C-5,I-1	Button #1	0.05	0.3	2.6	18.1	13.4	2.4	0.26	0.023	0.011	
CAF	C-5,I-1	Button #2	0.05	0.4	2.6	18.0	13.4	2.6	0.26	0.026	0.013	
WC	C-5,I-1	Button #2	0.02	0.3	2.2	18.2	13.5	2.4	0.25	0.025	0.010	
STL Wet	C-5,I-1	Button #1			2.2							
CAF	C-5,I-1	Button #1	*	0.3	2.3	18.3	13.4	2.4	*	0.029	0.012	re-run after PM

Lab	I.D.	Sample	C	Si	Mn	Cr	Ni	Mo	N	P	S	
CAF	C-5,I-3	Button #1	0.05	0.4	2.2	17.9	13.4	2.5	0.24	0.033	0.012	
CAF	C-5,I-3	Button #2	0.05	0.4	2.2	17.9	13.2	2.4	0.24	0.033	0.012	
WC	C-5,I-3	Button #2	0.05	0.4	1.8	18.2	13.4	2.5	0.23	0.034	0.018	
STL Wet	C-5,I-3	Button #1			1.8							
CAF	C-5,I-3	Button #1	*	0.4	1.8	18.3	13.3	2.5	*	0.034	0.012	re-run after PM

Lab	I.D.	Sample	C	Si	Mn	Cr	Ni	Mo	N	P	S	
CAF	C-5,I-6	Button #1	0.05	0.3	2.4	18.1	13.2	2.4	0.25	0.030	0.012	
CAF	C-5,I-6	Button #2	0.05	0.3	2.4	18.1	13.2	2.4	0.25	0.029	0.011	
WC	C-5,I-6	Button #2	0.04	0.3	2	18.3	13.3	2.4	0.24	0.031	0.018	
STL Wet	C-5,I-6	Button #1			1.9							
CAF	C-5,I-6	Button #1	*	0.3	2.0	18.4	13.3	2.4	*	0.033	0.012	re-run after PM

Lab	I.D.	Sample	C	Si	Mn	Cr	Ni	Mo	N	P	S	
CAF	A-1	Reported	0.04	0.4	2.4	18.2	13.3	2.4	0.26	*	*	
CAF	A-1	Cast on sample	*	0.5	2.1	18.0	13.4	2.4	*	0.034	0.009	
WC	A-1	Cast on sample	0.06	0.6	1.6	18.1	13.7	2.4	0.25	0.027	0.009	
CAF	A-1	Cast on sample	*	0.6	1.6	18.2	13.5	2.4	*	0.028	0.009	re-run after PM

Lab	I.D.	Sample	C	Si	Mn	Cr	Ni	Mo	N	P	S	
CAF	C-4	Reported	0.04	0.4	2.5	18.2	13.2	2.2	0.26	.030**	.014**	
CAF	C-4	Cast on sample	*	0.6	1.9	17.9	13.5	2.3	*	0.037	0.013	
WC	C-4	Cast on sample	0.04	0.6	1.5	17.8	13.6	2.4	0.25	0.030	0.012	
CAF	C-4	Cast on sample	*	0.6	1.4	18.2	13.6	2.4	*	0.031	0.009	re-run after PM

Lab	I.D.	Sample	C	Si	Mn	Cr	Ni	Mo	N	P	S	
CAF	C-1	Reported	0.06	0.5	2.7	18.1	13.1	2.2	0.27	0.018**	0.014**	
CAF	C-1	Cast on sample	*	0.7	2.2	18.1	13.1	2.2	*	0.021	0.010	
WC	C-1	Cast on sample	0.06	0.7	1.8	18.3	13.4	2.4	0.24	0.021	0.014	
CAF	C-1	Cast on sample	*	0.7	1.9	18.3	13.2	2.4	*	0.024	0.013	re-run after PM

Lab	I.D.	Sample	C	Si	Mn	Cr	Ni	Mo	N	P	S	
CAF	C-2	Reported	0.06	0.5	2.8	18.0	13.2	2.3	0.26	0.023**	0.018**	
CAF	C-2	Cast on sample	*	0.8	2.2	18.1	13.4	2.2	*	0.030	0.012	
WC	C-2	Cast on sample	0.07	0.9	1.6	18.2	13.7	2.2	0.23	0.023	0.014	
CAF	C-2	Cast on sample	*	0.8	1.6	18.2	13.5	2.3	*	0.024	0.012	re-run after PM

Lab	I.D.	Sample	C	Si	Mn	Cr	Ni	Mo	N	P	S	
CAF	C-3	Reported	0.04	0.4	2.5	18.2	13.3	2.3	0.25	0.023**	0.013**	
CAF	C-3	Cast on sample	*	0.6	1.9	18.0	13.3	2.4	*	0.027	0.010	
WC	C-3	Cast on sample	0.06	0.6	1.6	18.3	13.7	2.4	0.24	0.029	0.009	
CAF	C-3	Cast on sample	*	0.6	1.6	18.1	13.5	2.4	*	0.028	0.011	re-run after PM

Test Heat poured 1/14/04

Lab	I.D.	Sample	C	Si	Mn	Cr	Ni	Mo	N	P	S	
CAF	24424	Button	0.05	0.4	2.8	18.1	12.9	2.2	0.27	0.020	0.010	
CAF	24424	Keel bar	*	0.4	2.2	18.2	13.2	2.2	*	0.018	0.010	re-run after PM

* not analyzed by spectrometer.

** analyzed by wet chemistry.

For C-5 C and N were analyzed at CAF and at WC by Leco Analyzer, P+S analyzed on spectrometer.

MetalTek INTERNATIONAL

Addendum to CA1323 9-30-05

This is to supplement and report our progress on this corrective action.

We have discussed the variation in reading the Mn levels with the service technician and the spectrometer manufacturer. No new information has been obtained to explain the differences in reading Mn levels.

The chemistry for the shims poured from heat 29198 has been analyzed and is added to the spreadsheet attached. It shows similar readings for Mn.

The chemistry for the C-6 coil is also added to the spreadsheet. We aimed for higher Mn at the furnace to assure the higher Mn levels. The results indicate the effort was successful.

Update as to action steps:
Create a type standard that closely matches the Mn in CF8MNMNMOD.
Completed at WC and has been sent to another laboratory.
Request a revision to the chemistry range for Mn. (propose widening of Manganese since it has been proven to be effective at much lower concentrations than previously thought).
Pending.
Have each heat of CF8MNMNMOD verified independently for balance of program.
Complete for all coils to date.

C. Ruud

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

Chemistry Check with WISCO			Revised 9-30-05			Information in blue added 9-30-05						
Lab	**I.D.**	**Sample**	**C**	**Si**	**Mn**	**Cr**	**Ni**	**Mo**	**N**	**P**	**S**	
Heat #29198 for 5 C and 6 A shims												
CAF	29198	Reported 9/24/05	0.07	0.7	2.97	18.1	13.12	2.45	0.255	0.013**	0.01**	
CAF	29198	Separate Test bar	*	0.8	2.7	18.2	13.2	2.4	*	0.025	0.011	re-run after PM
Lab	**I.D.**	**Sample**	**C**	**Si**	**Mn**	**Cr**	**Ni**	**Mo**	**N**	**P**	**S**	
CAF	C-6,I-1	Button #1	0.04	0.3	2.5	18.2	13.5	2.4	0.25	0.028	0.010	run after PM
CAF	C-6,I-1	Button #2	*	0.2	2.4	18.1	13.6	2.4	*	0.031	0.012	run after PM
WC	C-6,I-1	Button #2	0.03	0.2	2.4	17.9	13.7	2.5	0.26	0.028	0.010	
Lab	**I.D.**	**Sample**	**C**	**Si**	**Mn**	**Cr**	**Ni**	**Mo**	**N**	**P**	**S**	
CAF	C-6,I-3	Button #1	0.04	0.4	2.4	18.2	13.4	2.3	0.25	0.034	0.011	run after PM
CAF	C-6,I-3	Button #2	*	0.4	2.4	18.2	13.7	2.3	*	0.033	0.012	run after PM
WC	C-6,I-3	Button #2	0.03	0.4	2.2	17.9	13.6	2.4	0.25	0.028	0.013	
Lab	**I.D.**	**Sample**	**C**	**Si**	**Mn**	**Cr**	**Ni**	**Mo**	**N**	**P**	**S**	
CAF	C-6,I-6	Button #1	0.04	0.4	2.6	18.3	13.4	2.4	0.26	0.031	0.010	run after PM
CAF	C-6,I-6	Button #2	*	0.4	2.5	18.2	13.7	2.4	*	0.031	0.013	run after PM
WC	C-6,I-6	Button #2	0.04	0.4	2.4	18.2	13.7	2.4	0.26	0.030	0.014	
Lab	**I.D.**	**Sample**	**C**	**Si**	**Mn**	**Cr**	**Ni**	**Mo**	**N**	**P**	**S**	
CAF	C-6,Z-3	Cast on sample	*	0.6	1.7	18.1	13.6	2.4	*	0.031	0.012	run after PM
WC	C-6,Z-3	Cast on sample	0.04	0.6	1.7	17.8	13.8	2.4	0.26	0.025	0.011	
Lab	**I.D.**	**Sample**	**C**	**Si**	**Mn**	**Cr**	**Ni**	**Mo**	**N**	**P**	**S**	
CAF	C-5,I-1	Button #1	0.05	0.3	2.6	18.1	13.4	2.4	0.26	0.023	0.011	
CAF	C-5,I-1	Button #2	0.05	0.4	2.6	18.0	13.4	2.6	0.26	0.026	0.013	
WC	C-5,I-1	Button #2	0.02	0.3	2.2	18.2	13.5	2.4	0.25	0.025	0.010	
STL Wet	C-5,I-1	Button #1			2.2							
CAF	C-5,I-1	Button #1	*	0.3	2.3	18.3	13.4	2.4	*	0.029	0.012	re-run after PM
Lab	**I.D.**	**Sample**	**C**	**Si**	**Mn**	**Cr**	**Ni**	**Mo**	**N**	**P**	**S**	
CAF	C-5,I-3	Button #1	0.05	0.4	2.2	17.9	13.4	2.5	0.24	0.033	0.012	
CAF	C-5,I-3	Button #2	0.05	0.4	2.2	17.9	13.2	2.4	0.24	0.033	0.012	
WC	C-5,I-3	Button #2	0.05	0.4	1.8	18.2	13.4	2.5	0.23	0.034	0.018	
STL Wet	C-5,I-3	Button #1			1.8							
CAF	C-5,I-3	Button #1	*	0.4	1.8	18.3	13.3	2.5	*	0.034	0.012	re-run after PM
Lab	**I.D.**	**Sample**	**C**	**Si**	**Mn**	**Cr**	**Ni**	**Mo**	**N**	**P**	**S**	
CAF	C-5,I-6	Button #1	0.05	0.3	2.4	18.1	13.2	2.4	0.25	0.030	0.012	
CAF	C-5,I-6	Button #2	0.05	0.3	2.4	18.1	13.2	2.4	0.25	0.029	0.011	
WC	C-5,I-6	Button #2	0.04	0.3	2	18.3	13.3	2.4	0.24	0.031	0.018	
STL Wet	C-5,I-6	Button #1			1.9							
CAF	C-5,I-6	Button #1	*	0.3	2.0	18.4	13.3	2.4	*	0.033	0.012	re-run after PM
Lab	**I.D.**	**Sample**	**C**	**Si**	**Mn**	**Cr**	**Ni**	**Mo**	**N**	**P**	**S**	
CAF	A-1	Reported	0.04	0.4	2.4	18.2	13.3	2.4	0.26	*	*	
CAF	A-1	Cast on sample	*	0.5	2.1	18.0	13.4	2.4	*	0.034	0.009	
WC	A-1	Cast on sample	0.06	0.6	1.6	18.1	13.7	2.4	0.25	0.027	0.009	
CAF	A-1	Cast on sample	*	0.6	1.6	18.2	13.5	2.4	*	0.028	0.009	re-run after PM
Lab	**I.D.**	**Sample**	**C**	**Si**	**Mn**	**Cr**	**Ni**	**Mo**	**N**	**P**	**S**	
CAF	C-4	Reported	0.04	0.4	2.5	18.2	13.2	2.2	0.26	.030**	.014**	
CAF	C-4	Cast on sample	*	0.6	1.9	17.9	13.5	2.3	*	0.037	0.013	
WC	C-4	Cast on sample	0.04	0.6	1.5	17.8	13.6	2.4	0.25	0.030	0.012	
CAF	C-4	Cast on sample	*	0.6	1.4	18.2	13.6	2.4	*	0.031	0.009	re-run after PM
Lab	**I.D.**	**Sample**	**C**	**Si**	**Mn**	**Cr**	**Ni**	**Mo**	**N**	**P**	**S**	
CAF	C-1	Reported	0.06	0.5	2.7	18.1	13.1	2.2	0.27	0.013**	0.014**	
CAF	C-1	Cast on sample	*	0.7	2.2	18.1	13.1	2.2	*	0.021	0.010	
WC	C-1	Cast on sample	0.06	0.7	1.8	18.3	13.4	2.4	0.24	0.021	0.014	
CAF	C-1	Cast on sample	*	0.7	1.9	18.3	13.2	2.4	*	0.024	0.013	re-run after PM
Lab	**I.D.**	**Sample**	**C**	**Si**	**Mn**	**Cr**	**Ni**	**Mo**	**N**	**P**	**S**	
CAF	C-2	Reported	0.06	0.5	2.8	18.0	13.2	2.3	0.26	0.023**	0.018**	
CAF	C-2	Cast on sample	*	0.8	2.2	18.1	13.4	2.2	*	0.030	0.012	
WC	C-2	Cast on sample	0.07	0.9	1.6	18.2	13.7	2.2	0.23	0.023	0.014	
CAF	C-2	Cast on sample	*	0.8	1.6	18.2	13.5	2.3	*	0.024	0.012	re-run after PM

Lab	I.D.	Sample	C	Si	Mn	Cr	Ni	Mo	N	P	S	
CAF	C-3	Reported	0.04	0.4	2.5	18.2	13.3	2.3	0.25	0.023**	0.013**	
CAF	C-3	Cast on sample	*	0.6	1.9	18.0	13.3	2.4	*	0.027	0.010	
WC	C-3	Cast on sample	0.06	0.6	1.6	18.3	13.7	2.4	0.24	0.029	0.009	
CAF	C-3	Cast on sample	*	0.6	1.6	18.1	13.5	2.4	*	0.023	0.011	re-run after PM
Test Heat poured 1/14/04												
Lab	**I.D.**	**Sample**	**C**	**Si**	**Mn**	**Cr**	**Ni**	**Mo**	**N**	**P**	**S**	
CAF	24424	Reported	0.054	0.4	2.8	18.1	12.94	2.21	0.27	0.020	0.010	
CAF	24424	Keel bar	*	0.4	2.2	18.2	13.2	2.2	*	0.013	0.010	re-run after PM
* not analyzed by spectrometer.												
** analyzed by wet chemistry.												
For C-5 and C-6 - C and N were analyzed at CAF and at WC by Leco Analyzer, P+S analyzed on spectrometer.												

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

MetalTek INTERNATIONAL

Corrective Action 1379
Carondelet Division - CA / PA / RGA Database
Corrective Action Type NCR
Date 8/31/2005
CA Originator C. Ruud
Applies to: Weld Material Lincoln 3018926-78309

Description of Defect / Non-Conformance
Material failed elongation and one of three charpy impact tests at -320 F. The average of the specimens exceeds the minimum. See S8 of ASTM A 703/A 703M.

Root Cause
The sample of the weld contained defects not detected.

Corrective Action
Retest material already at Lab.
If needed, make a new weld plate after reviewing process with welder and weld another sample.

Verification of Corrective Action
Retest results. If new plates are needed, the new plate will be x-rayed prior to testing.

Estimated Completion Date
9-2-05

Actual Completion Date TBD

Signed: C. Ruud

CC: R. Suria, Barry Craig, Joe Edwards, E.J. Kubick

Nonconformance Report: CA1379

Project Disposition:
Since the re-test meets requirements, this NCR can now be considered closed.

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 10:09:58 -05'00'

Procurement Technical Representative

11/7/05

Responsible Line Manager:

MetalTek INTERNATIONAL

Corrective Action 1454
Carondelet Division - CA / PA / RGA Database
Corrective Action Type NCR
Date 11/18/2005
CA Originator C. Ruud
Applies to: C-5 Coil casting

Description of Defect / Non-Conformance
Zone 1 Tensile test at 77K failed elongation at 31% compared to the specification minimum of 32%. A retest also failed at 29%. All other properties exceeded the specification of NCSX-CSPEC-141-03-09. See attached summary of room temperature and cryogenic test results.

Root Cause
Zone 1 test samples have solidified with much less superheat than the other zones as a result of their relative orientation in the mold and mold filling. Zone 1 test bars are in the bottom of the drag, zone 2 and 3 are much higher in the mold. Zone 1 test bars are getting the first cold metal poured which explains the fine grain structure versus zones 2 and 3. Photomicrographs verify that zone 1 has much finer grain structure than the other zones, see St Louis Testing lab report 05M1167. To verify our thinking the zone 1 test bar was heat treated for 7 hours at 2050 F, the same as the coil casting. Photomicrographs indicate that the grain structure did not coarsen significantly, see St Louis Testing lab report 05M1182. Therefore we conclude the fine structure caused by cold metal entering the cavity is adversely affecting ductility at cryogenic temperatures. Photomicrographs taken at Westmoreland indicate there were no defects to cause the failure, see attached photos.

Corrective Action
Use as is.

Verification of Corrective Action
TBD

Preventive Action
Possibly relocate the cast on bars.

Estimated Completion Date
TBD

Actual Completion Date
TBD

Signed: C. Ruud

CC: Jim Galaske, Barry Craig, Joe Edwards, E.J. Kubick, Jerry Markham, Roger Broman

C-5 Coil 11/18/2005

	77K (-320F)							293K (RT)						
Casting		Test 1			Test 2									
Property	Required	C5-1Z	C5-2Z	C5-3Z	C5-1Z	C5-2Z	C5-3Z	Required	C5-1Z	C5-2Z	C5-3Z			
Elastic Modulus	21 Msi (144.8 Gpa)	33	31.8	28	34.5	28.2	25.9	20 Msi (137.9 Gpa)	28.4	27.7	25.9			
0.2% Yield Strength	72 ksi (496.4 Mpa)	112.6	98.3	95.5	111.2	102.5	95	30 ksi	41.5	37.7	37.1			
Tensile Strength	95 ksi (655 Mpa)	182.5	166.1	163.7	177.4	172.3	163.5	78 ksi (537.8 Mpa)	92.9	84.4	83.7			
Elongation	32%	31%	52%	59%	29%	41%	64%	36%	55%	52%	67%			
Charpy V – notch Energy	35 ft. lbs. (47.4 J)	81	73	87				50 ft-lbs (67.8 J)	130	131	156			

DISPISITION OF CA 1454 (C5 ELONGATION)

NCSX accepts the 31% elongation (vs. 32% spec. requirement) from one of the test bars from the C5 winding form. However, we request that the details of the proposed corrective action be discussed at a Quality conference call before being implemented.

Phil Heitzenroeder

Digitally signed by Phil Heitzenroeder
DN: CN = Phil Heitzenroeder, C = US, O = PPPL, OU = Mech. Eng. Division
Reason: I am the author of this document
Date: 2005.11.22 17:17:09 -05'00'

Tech. Rep.

Brad Nelson

Digitally signed by Brad Nelson
DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov
Date: 2005.11.22 17:20:45 -05'00'

NCSX Core Systems Engrg. Manager

MetalTek INTERNATIONAL

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

Final Inspection Report

Customer ENERGY INDUSTRIES OF OHIO

Pattern: MCWF-C5 COIL

Order PPPL-FP-LTS-2

ASTM Metal CF8MNMN MOD

Date 11/4/2005

Type Description	Cert Number	Procedure	Acceptance Criteria	Actual
Liquid Penetrant	172810-1	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	172810-1	SOP Mag Perm 100 Rev 1	<1.02	Acceptable
Radiographic	172810-1	Technique # 12726	MSS SP 54	Acceptable
Visual	172810-1	CQP - 500 REV 4	ASTM A802 LEVEL 2	Acceptable

Liquid Penetrant

Technician: Jason Rees
ASNT Level II

Visual
Technician: Jason Rees
ASNT Level II

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

Certificate of Conformance

ENERGY INDUSTRIES OF OHIO

Order Number PPPL-FP-LTS-2
Pattern MCWF-C5 COIL
ASTM CF8MNMN MOD

Date 11/4/2005

Cert Number
172810-1

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.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

MetalTek INTERNATIONAL

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

Final Inspection Report

Customer ENERGY INDUSTRIES OF OHIO

Pattern: SE-141-073 COIL C SHIM

S/N 5

Order PPPL-FP-LTS-2

ASTM Metal CF8MNMN MOD

Date 10/28/2005

Type Description	Cert Number	Procedure	Acceptance Criteria	Actual
Liquid Penetrant	S73220-2	CQP - 300 Rev 9	ASTM A903 Level II	Acceptable
Mag Perm	S73220-2	SOP Mag Perm 100 Rev 1	<1.02	Acceptable
Radiographic	S73220-2	Technique # 12726	MSS SP 54	Acceptable
Visual	S73220-2	CQP - 500 REV 4	ASTM A802 LEVEL 2	Acceptable

Liquid Penetrant
Technician: Jim Shanahan
ASNT Level II

Visual
Technician: Jason Rees
ASNT Level II

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

Certificate of Conformance

ENERGY INDUSTRIES OF OHIO

Order Number	PPPL-FP-LTS-2	
Pattern	SE-141-073 COIL C SHIM	S/N 5
ASTM	CF8MNMN MOD	Date 10/28/2005

Cert Number

S73220-2

C shim for C-5 coil was poured from heat number 29198. 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.

Respectfully Submitted,
Charles A. Ruud
Quality Assurance Manager

Superior Quality Engineered Metal Products

www.MetalTekInt.Com

EIO
Energy Industries of Ohio
SUPPLIER QUALITY RELEASE

		Date: 11-23-05

I. General Information:			
Project Name:	Modular Coil Winding Form C5		
PO No:	NCSX-SOW-141-02-01	Rev.:	9
Supplier:	MetalTek		
Procurement Agent:	EIO		
Shipment:	☒ Partial ☐ Final		

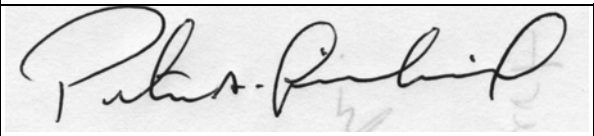
II. Material Description
Casting C5 Coil

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
Variances – See attached package for CA's and deviations CA1454 Attached, elongation under spec

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

V. Supplier Quality Representative Sign Off		
	X	11-23-05
Supplier Quality Representative (SQR) Print/Type Name	Supplier Quality Representative (SQR) Signature	Date

VI. Supplier Approval For Shipment		
Procurement Agent Notified of Shipment	Date: 11-23-05	
Required Vendor Data Ready for Shipment	Date: 11-23-05	
Peter A Djordjevich	 X	11-23-05

EIO
Energy Industries of Ohio
SUPPLIER QUALITY RELEASE

		Date: 11-23-05

I. General Information:			
Project Name:	Modular Coil Winding Form C5		
PO No:	NCSX-SOW-141-02-01	Rev.:	9
Supplier:	MetalTek		
Procurement Agent:	EIO		
Shipment:	☒ Partial ☐ Final		

Supplier's Representative Print/Type Name	Supplier's Signature	Date

1. Enter:
   Project Name
   PO Number
   Supplier
   Procurement Agent

2. Enter a brief description of items being released, including applicable drawing number(s), dash or item number(s), drawing revision letter, specification(s), and serial number(s).

3. Self-Explanatory

4. Record any unusual circumstance, such as a conditional release.

5. The Supplier's representative shall sign and date.

7. Signature and date of the Supplier's authorized representative indicating shipping date.

8. In case of partial release, the supplier shall maintain copies of each sequential "Supplier Quality Release" and establish complete accountability of material release on final shipment.

9. Supplier shall include a copy of the completed form with each shipment.