

First Time



# D.L. RICCI CORP. PWHT JOB ANALYSIS SHEET

CUSTOMER: Major Tool  
 JOBSITE: Indianapolis Indiana  
 DATE: 1-31-06 CUSTOMER CONTACT: Doug McCorkle  
 TECHNICIAN: Eric, Herb, Bret, Joe, Seth, Kevin PROCEDURE/MATERIAL: Inconel/stainless steel  
 WORK ORDER#: 65678/1.0 JOB LOCATION: Major tool shop  
 SYSTEM #: \_\_\_\_\_ RECORDER S/N#: R-91, RC-088, RC-074, RC-079  
 I.S.O. LINE #: \_\_\_\_\_ RC-070, RC-093, RC-037, RC-092, R-94, R-93, R-95  
 SPOOL #: \_\_\_\_\_  
 FIELD WELD #: \_\_\_\_\_  
 CHART #: 11 TOTAL WELDS: \_\_\_\_\_ TOTAL TC'S: 101

WORK DESCRIPTION: ran a bake at 707° on the vessel and 275°-311° on the parts

parts  
 HEAT CYCLE: 300° at 50°/hr 120 min. at 300° held 21 hours  
70 min. at 707° held 24 hours.  
 AMBIENT TO 707° F AT 50°/hr F/HR, ABOVE \_\_\_\_\_ F AT \_\_\_\_\_ F/HR  
 HOLD FOR \_\_\_\_\_ HRS AT \_\_\_\_\_ F/HR, +/- \_\_\_\_\_ F, COOL TO \_\_\_\_\_ F AT \_\_\_\_\_ F/HR.  
 COOL TO AMBIENT UNDER INSULATION Y/N \_\_\_\_\_

### PWHT CYCLE INFORMATION:

started at Ambient and ramped up 50° every 20 min on the vessel till 707  
started at Ambient and slowly ramped up on the parts 50° every  
2 hours or so.  
when the vessel got to 700° we held it the first time 24 hours First Time  
when the parts got to 300° we held them 21 hours the First Time  
when hold time was complete we ramp Down on the vessel 50° per ~~hour~~ 70 min  
Till about 500° and then the parts fell out of soak and then we  
 \* TO INCLUDE ALL INFORMATION RELEVANT TO PWHT CYCLE\*

Neal Jacobs 2/11/06  
 TECHNICIAN DATE

CUSTOMER ACCEPTANCE\*: [Signature]  
 \* SIGNATURE ACCEPTS ABOVE HEAT CYCLE PROCEDURE

DATE: 11 FEB 2006

start to ramp the parts Down 50° per ~~hour~~ 70 min to 200°  
 and at 500° we changed the ramp rate on the vessel to 90° per hour  
 and target temp to 100° per ~~step~~ step and we would hold each step till  
 we were within 10° Top to Bottom

K Drive: Job Sheet- Excel File



# D.L. RICCI CORP. TIME TEMPERATURE TABULATIONS

CUSTOMER: \_\_\_\_\_

DATE: \_\_\_\_\_

CUSTOMER CONTACT: \_\_\_\_\_

TECHNICIAN: \_\_\_\_\_

PROCEDURE/MATERIAL: \_\_\_\_\_

WORK ORDER#: 26

JOB LOCATION: \_\_\_\_\_

SYSTEM #: \_\_\_\_\_

RECORDER SERIAL #: AH0396049 R-95

I.S.O. LINE #: \_\_\_\_\_

SPOOL #: \_\_\_\_\_

FIELD WELD #: \_\_\_\_\_

CHART #: \_\_\_\_\_

TOTAL WELDS: \_\_\_\_\_

TOTAL TC'S: \_\_\_\_\_

TIME/TC	1	2	4	6	7	8	10	11	13	14	15	17
14:12	69	109	69	70	70	69	69	69	69	70	70	67
14:42	74	124	70	79	113	109	78	110	79	112	119	67
15:12	85	121	74	82	111	109	79	99	92	110	110	69
15:42	92	121	78	89	111	109	86	98	99	112	118	69
16:12	97	122	82	103	112	110	99	98	103	113	119	72
16:42	107	122	-	-	113	110	-	101	-	114	119	-
17:12	107	123	89	106	113	111	98	100	107	114	119	77
17:42	107	122	-	-	113	110	-	101	-	114	119	-
18:12	-	121	100	-	113	110	-	102	-	114	119	-
18:42	-	121	-	-	113	110	-	102	-	114	119	-
19:12	-	120	-	-	113	110	-	103	-	114	119	-
19:42	-	108	-	-	118	114	-	111	-	119	125	-
20:12	-	153	-	-	157	152	-	128	-	136	146	-
20:42	-	167	-	-	149	145	-	133	-	148	161	-
21:12	-	167	-	-	151	146	-	134	-	151	163	-
21:42	-	192	-	-	177	165	-	154	-	170	185	-
22:12	-	217	-	-	190	184	-	170	-	188	207	-
22:42	-	230	-	-	202	196	-	180	-	200	220	-
23:12	-	254	-	-	222	215	-	196	-	219	241	-
23:42	-	262	-	-	231	225	-	199	-	228	250	-
00:12	-	262	-	-	232	226	-	199	-	229	251	-
00:42	-	262	-	-	232	226	-	201	-	230	252	-
1:12	-	261	-	-	232	226	-	201	-	230	252	-
1:42	-	260	-	-	232	226	-	204	-	230	252	-
2:12	-	259	-	-	232	225	-	206	-	230	251	-
2:42	-	258	-	-	232	225	-	207	-	230	251	-
3:12	-	256	-	-	232	224	-	207	-	229	250	-
3:42	-	256	-	-	232	224	-	211	-	229	249	-
4:12	-	255	-	-	232	223	-	213	-	228	249	-

\* Time/Temperature Log shall be used to record temperatures above 800 Degrees F (or per applicable procedure) every hour during the heating and cooling cycles and every one-half hour during PWHT cycle.



# D.L. RICCI CORP.

## TIME TEMPERATURE TABULATIONS

CUSTOMER: \_\_\_\_\_

DATE: 2-7

CUSTOMER CONTACT: \_\_\_\_\_

TECHNICIAN: \_\_\_\_\_

PROCEDURE/MATERIAL: \_\_\_\_\_

WORK ORDER#: \_\_\_\_\_

JOB LOCATION: \_\_\_\_\_

SYSTEM #: \_\_\_\_\_

RECORDER SERIAL #: AH039C049 R-95

I.S.O. LINE #: \_\_\_\_\_

SPOOL #: \_\_\_\_\_

FIELD WELD #: \_\_\_\_\_

CHART #: \_\_\_\_\_

TOTAL WELDS: \_\_\_\_\_

TOTAL TC'S: \_\_\_\_\_

Side or Flang

TIME/TC	#2	#7	#8	#11	#14	#15		1	2
4:12	255	232	223	213	228	249			
4:42	254	232	223	215	228	249			
5:12	252	232	222	217	228	248			
5:42	250	231	222	220	228	248			
6:12	249	231	221	222	227	248			
6:42	247	231	220	225	227	248			
7:12	245	231	220	228	227	247			
7:42	243	231	219	231	226	247			
8:12	242	231		236	226	246			
8:42	239	231	0	248	225	245			
9:12	n	on	n	247	225	246			
9:42	I#5	I#5	I	246	225	245			
10:12				259	IT on	on			
10:42	on	on	+	267			10:42	211	263
11:12	Zone	Zone	S	275	Z	ITD	11:12	221	272
11:42			S	276	0	on	11:42	246	278
12:12			0	278	n	Z	12:12	250	276
12:42			0	280	n	Z	12:42	251	283
13:12			n	282	e	0	13:12	254	287
13:42			n	284	e	0	13:42	256	291
14:12			Z	286		n	14:12	257	294
14:42			Z	287		n	14:42	258	298
15:12			0	288		e	15:12	298	300
15:42			0	289		e	15:42	298	302
16:12			n	290			16:12	310	290
16:42			e	291			16:42	292	299
17:12			e	292			17:12	279	305
17:42				280			17:42	303	293
18:12				298			18:12	307	279

\* Time/Temperature Log shall be used to record temperatures above 800 Degrees F (or per applicable procedure) every hour during the heating and cooling cycles and every one-half hour during PWHT cycle.



# D.L. RICCI CORP.

## TIME TEMPERATURE TABULATIONS

CUSTOMER: \_\_\_\_\_

DATE: 2-8

CUSTOMER CONTACT: \_\_\_\_\_

TECHNICIAN: \_\_\_\_\_

PROCEDURE/MATERIAL: \_\_\_\_\_

WORK ORDER#: \_\_\_\_\_

JOB LOCATION: \_\_\_\_\_

SYSTEM #: \_\_\_\_\_

RECORDER SERIAL #: A H039 C049 B-45

I.S.O. LINE #: \_\_\_\_\_

SPOOL #: \_\_\_\_\_

FIELD WELD #: \_\_\_\_\_

CHART #: \_\_\_\_\_

TOTAL WELDS: \_\_\_\_\_

TOTAL TC'S: \_\_\_\_\_

fact  
work

TIME/TC	1	2	11						
18:42	279	301	293						
19:12	279	301	294						
19:42	279	301	294						
20:12	279	302	295						
20:42	279	303	295						
21:42	279	303	295						
22:42	279	304	296						
23:42	279	304	296						
00:42	279	304	296						
1:42	279	305	296						
2:42	278	305	296						
3:42	278	305	296						
4:42	278	305	296						
5:42	278	306	296						
6:42	278	305	296						
7:42	278	305	296						
8:42	278	305	296	Bottom					
9:42	279	305	296	East part					
10:42	281	302	296	Zone					
11:42	282	299	297	12					
12:12	284	297	293	305					
12:42	284	295	289	300					
13:42	287	290	283	290					
14:42	288	285	277	280					
15:42	256	270	258	271					
16:42	237	255	222	261					
17:42	207	241	201	250					
18:42	182	227	173	231					
19:42	161	214	173	225					

ok

\* Time/Temperature Log shall be used to record temperatures above 800 Degrees F (or per applicable procedure) every hour during the heating and cooling cycles and every one-half hour during PWHT cycle.



# D.L. RICCI CORP.

## TIME TEMPERATURE TABULATIONS

CUSTOMER: \_\_\_\_\_

DATE: 2-9

CUSTOMER CONTACT: \_\_\_\_\_

TECHNICIAN: \_\_\_\_\_

PROCEDURE/MATERIAL: \_\_\_\_\_

WORK ORDER#: \_\_\_\_\_

JOB LOCATION: \_\_\_\_\_

SYSTEM #: \_\_\_\_\_

RECORDER SERIAL #: AH 039C049

I.S.O. LINE #: \_\_\_\_\_

SPOOL #: \_\_\_\_\_

FIELD WELD #: \_\_\_\_\_

CHART #: \_\_\_\_\_

TOTAL WELDS: \_\_\_\_\_

TOTAL TC'S: 4

*Bottom of Cast Port*

TIME/TC	1	2	81	92
20:42	145	202	161	212
21:42	133	192	151	200
22:12	128	187	146	194
23:12	119	178	138	183
00:12	111	169	130	173
01:12	104	161	125	164
01:26	104	161	125	164
2:26	116	153	122	154
3:26	137	156	146	148
4:26	172	162	167	145
5:26	212	178	190	148
6:26	252	200	213	156
7:26	262	212	216	170
8:26	269	230	255	187
9:26	282	259	253	204
10:26	285	262	255	222
11:26	286	269	285	240
12:26	295	276	273	257
13:26	283	284	280	275
14:26	283	292	286	290
15:26	283	297	289	301
16:26	282	301	292	308
17:26	283	302	294	305
18:26	282	303	296	303
19:26	282	304	297	302
20:26	283	304	298	301
21:26	283	305	299	300
22:26	282	305	300	301
23:26	282	306	301	301

Checked Rec. # 115

\* Time/Temperature Log shall be used to record temperatures above 800 Degrees F (or per applicable procedure) every hour during the heating and cooling cycles and every one-half hour during PWHT cycle.



# D.L. RICCI CORP.

## TIME TEMPERATURE TABULATIONS

CUSTOMER: \_\_\_\_\_  
DATE: 2-10 CUSTOMER CONTACT: \_\_\_\_\_  
TECHNICIAN: \_\_\_\_\_ PROCEDURE/MATERIAL: \_\_\_\_\_  
WORK ORDER#: \_\_\_\_\_ JOB LOCATION: \_\_\_\_\_  
SYSTEM #: \_\_\_\_\_ RECORDER SERIAL #: AH 039 0049  
I.S.O. LINE #: \_\_\_\_\_  
SPOOL #: \_\_\_\_\_  
FIELD WELD #: \_\_\_\_\_  
CHART #: \_\_\_\_\_ TOTAL WELDS: \_\_\_\_\_ TOTAL TC'S: 4

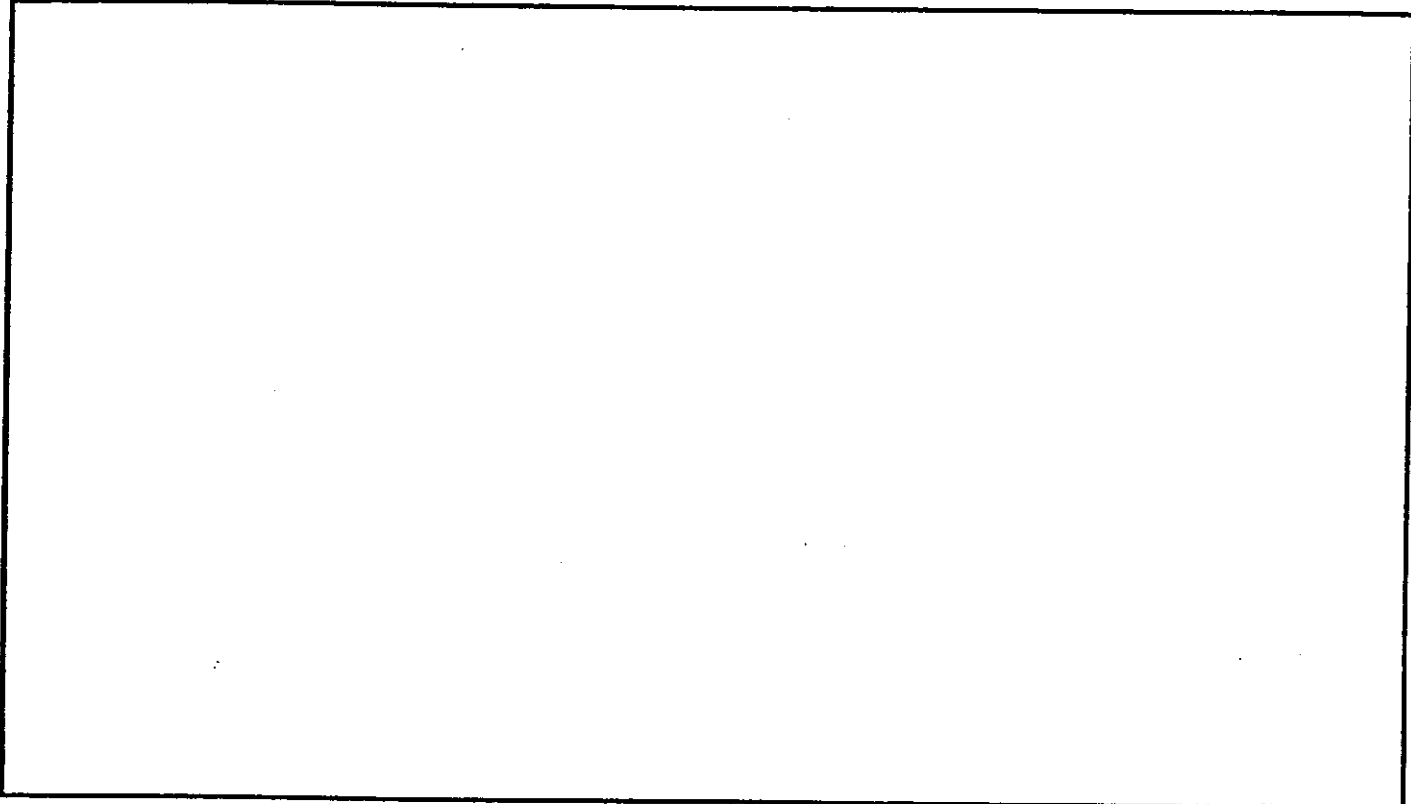
TIME/TC	1	2	11	12					
00:26	283	306	301	301					
1:26	283	307	302	302					
2:26	283	307	302	302					
3:26	283	307	303	302					
4:26	283	307	303	303					
5:26	283	308	303	303					
6:26	283	308	303	303					
7:26	283	308	303	303					
8:26	283	308	301	303					
9:26	284	306	299	304					
10:26	285	303	295	300					
11:26	276	297	277	283					
12:26	247	285	254	284					
13:26	238	268	234	272					
14:26	203	250	216	258					
15:26	181	233	200	243					
16:26	162	218	185	228					
17:26	147	205	171	213					
18:26	134	192	158	199					

\* Time/Temperature Log shall be used to record temperatures above 800 Degrees F (or per applicable procedure) every hour during the heating and cooling cycles and every one-half hour during PWHT cycle.



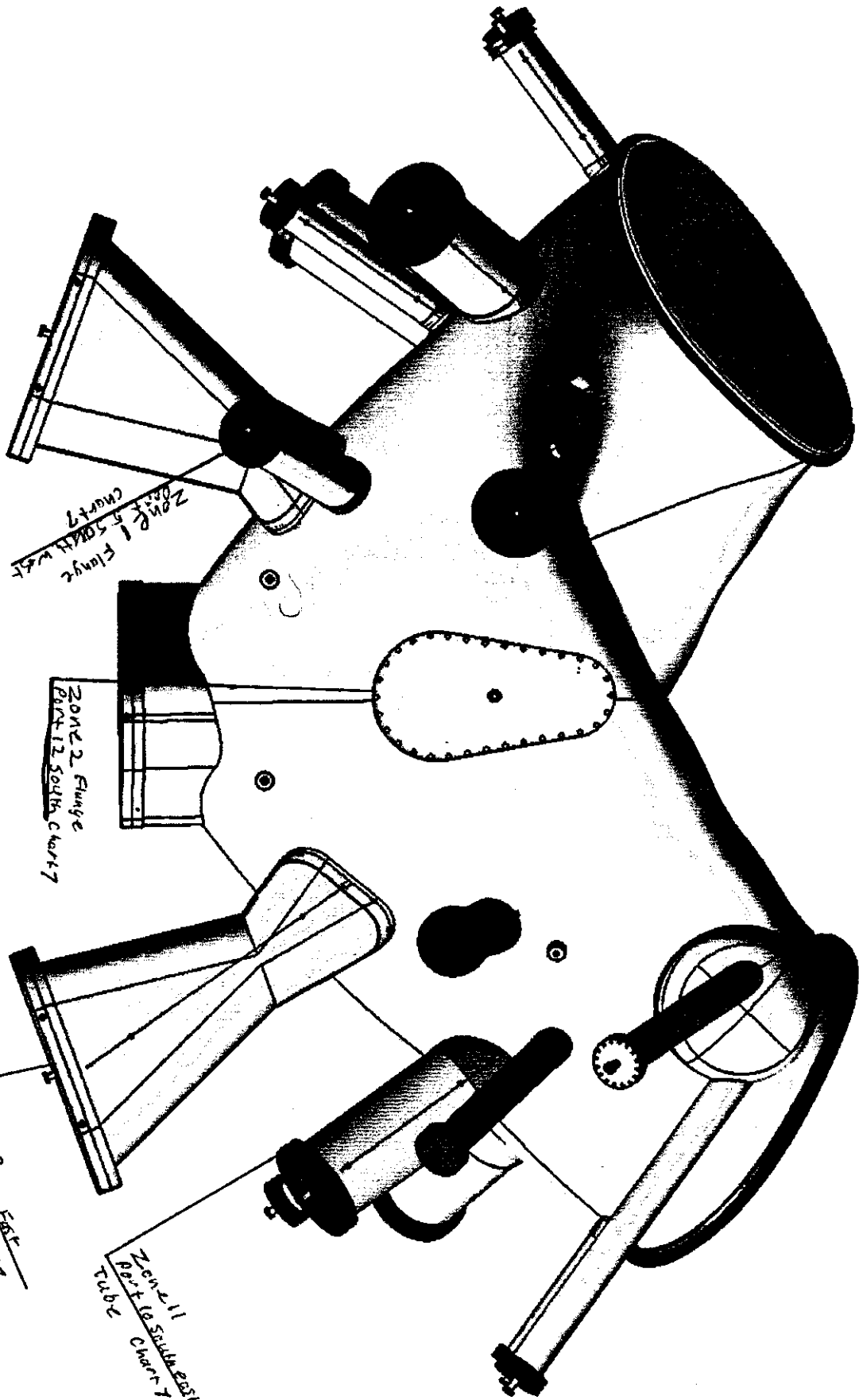
**D.L. RICCI CORP.**  
**WELD AND THERMOCOUPLE IDENTIFICATION**

DATE: 1-31-06 CUSTOMER CONTACT: Doug McCorkle  
 TECHNICIAN: Eric, Herb, Brad, Joe, Seth, Kevin PROCEDURE/MATERIAL: Inconel / stainless steel  
 WORK ORDER#: \_\_\_\_\_ JOB LOCATION: Major Tool shop  
 SYSTEM #: \_\_\_\_\_ RECORDER S/N#: R-91, RC-088, RC-074, RC-079  
 I.S.O. LINE #: \_\_\_\_\_ RC-070, RC-093, RC-037, RC-092, R-94, R-93, R-95  
 SPOOL #: \_\_\_\_\_  
 FIELD WELD #: \_\_\_\_\_  
 CHART #: 11 Recorders TOTAL WELDS: \_\_\_\_\_ TOTAL TC'S: 101



WELD IDENTIFICATION AND THERMOCOUPLE LAYOUT  
 THIS I.S.O. DRAWING IS COMPLETED BY THE PWHT TECHNICIAN

Herb [Signature] 2-11-06  
 TECHNICIAN DATE



R-95  
Chart 7  
South Recorder

Zone 12 Flange  
Part 12 South Chart 7

Zone 11  
Part 12 South Chart 7  
Tube





## PWHT QUALITY CONTROL SHEET

CUSTOMER Major Tool W/O# \_\_\_\_\_

DATE: 2-11-06

1. Customer has given specific direction to D.L. Ricci, as to which welds need PWHT. Heat Treating Documentation packet has been given to the technician. The technician as reviewed the procedure.  
Herb Spade  
Technician
2. Drawings of each spool piece have been completed. Each drawing shows the spool piece number and describes each weld on the spool.  
Herb Spade  
Technician
3. Welds are wrapped and troubleshooting is complete. All zones are working properly. Technician has reviewed procedure (ramp rate, soak temperature, soak time).  
Herb Spade  
Technician
4. Welds are at soak temperature. Technician has reviewed chart (checking ramp rate up to soak).  
Herb Spade  
Technician
5. When soak is complete, technician has reviewed chart, checked soak time/temperature and reviewed ramp rate to completion.  
Herb Spade  
Technician
6. PWHT is complete. Technician has reviewed chart and everything is correct. (Do not unwrap welds until this stage is signed off)  
Herb Spade  
Technician
7. Unwrap welds. Take hardness test if required and record results.  
\_\_\_\_\_  
Technician



Electric Heating Systems, Inc.

109 North Gold Drive  
Robbinsville, NJ 08691

Phone: 609.259.4116  
Fax: 609.259.4119

**CERTIFICATE OF CALIBRATION**

**CERT #** 2005678

**NAME** E.H.S. R-95

**JOB #**

MODEL : AH 3745-N00	SERIAL NUMBER: AH-039C049
THERMOCOUPLE TYPE : K	RANGE: 0 / 2000 degF
CALIBRATION DATE : 9/23/2005	DUE DATE : 9/23/2006

TEST EQUIPMENT USED:	
MANUFACTURER : FLUKE	CALIBRATION DATE : 6/24/2005
MODEL No 714	ACCURACY : +/-10 DEG F
SERIAL No 7216012	

**AMBIENT TEMPERATURE: 72**

**HUMIDITY: 69%**

INPUT	AS FOUND	AS LEFT	ACCURACY
200	200	200	+/-10 DEG F
800	800	800	+/-10 DEG F
1000	1000	1000	+/-10 DEG F
1200	1200	1200	+/-10 DEG F
1600	1600	1600	+/-10 DEG F
1800	1800	1800	+/-10 DEG F

THIS INSTRUMENT HAS BEEN CALIBRATED WITHIN MANUFACTURERS SPECIFICATION.  
THIS CALIBRATION IS TRACEABLE TO THE N. I. S. T.  
WE GUARANTEE THAT THIS PRODUCT HAS PASSED THROUGH E. H. S. STANDARD  
TESTING AND SATISFIES ALL SPECIFICATIONS

**CALIBRATED BY:-** PHIL ISAACSON

**SIGNATURE :-**

2<sup>nd</sup> Time



# D.L. RICCI CORP. PWHT JOB ANALYSIS SHEET

CUSTOMER: Major Tool  
 JOBSITE: Indianapolis Indiana  
 DATE: 2-9-06 CUSTOMER CONTACT: Dana McCorkle  
 TECHNICIAN: Eric, Herb, Bret, Joe, Seth, Kevin PROCEDURE/MATERIAL: Inconel/stainless steel  
 WORK ORDER#: \_\_\_\_\_ JOB LOCATION: Major Tool Shop  
 SYSTEM #: \_\_\_\_\_ RECORDER S/N#: R-91, RC-088, 074, 079, 070  
 I.S.O. LINE #: \_\_\_\_\_ RC-093, RC037, RC-092, R-94, R-93, R-9  
 SPOOL #: \_\_\_\_\_  
 FIELD WELD #: \_\_\_\_\_  
 CHART #: 11 charts TOTAL WELDS: \_\_\_\_\_ TOTAL TC'S: 101

WORK DESCRIPTION: When Temps were all lower than 212° we <sup>started</sup> ~~started~~ ramping up the vessel and ports till we got the parts back up to 300° & vessel back up to 707° and then held parts at Temp for 21 hours & The vessel for 18 hours so the both had a total of 42 hours of soak

Parts from 200° to 300° at 50°/per 120 min; then Held 21 hours  
 HEAT CYCLE: From 200° to 707° at 50°/per 70 min Then Held 18 hours.  
 AMBIENT TO \_\_\_\_\_ F AT \_\_\_\_\_ F/HR, ABOVE \_\_\_\_\_ F AT \_\_\_\_\_ F/HR  
 HOLD FOR \_\_\_\_\_ HRS AT \_\_\_\_\_ F/HR, +/- \_\_\_\_\_ F, COOL TO \_\_\_\_\_ F AT \_\_\_\_\_ F/HR.  
 COOL TO AMBIENT UNDER INSULATION Y/N \_\_\_\_\_.

### PWHT CYCLE INFORMATION:

When hold time was complete we ramped down on the vessel at 50° per hour till 500° to ~~to~~ keep parts in soak for 3 extra hours so we would have 42 hours on both parts and vessel after we were at 500° we set the ramp to 90° per hour and the target temp down 100° and held at each target temp till even and then set target temp 100° less until we were and 200° Then we shut off reaches and let cool.

\* TO INCLUDE ALL INFORMATION RELEVANT TO PWHT CYCLE \*

Herb Jacobs 2/11/06  
 TECHNICIAN DATE

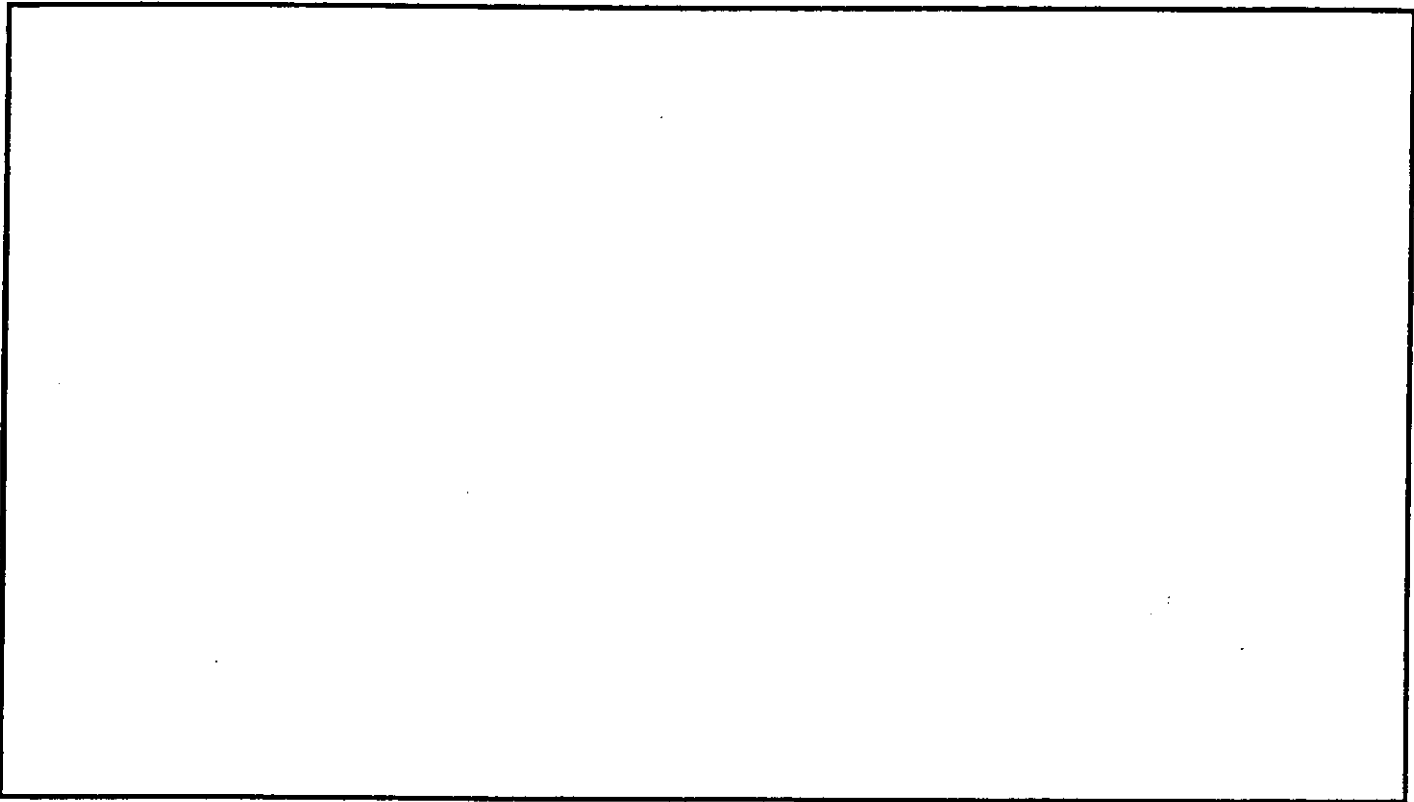
CUSTOMER ACCEPTANCE\*: [Signature]  
 \* SIGNATURE ACCEPTS ABOVE HEAT CYCLE PROCEDURE

DATE: 11 Feb 2006



**D.L. RICCI CORP.**  
**WELD AND THERMOCOUPLE IDENTIFICATION**

DATE: 2-9-06 CUSTOMER CONTACT: Doug McCorkle  
 TECHNICIAN: Eric, Herb, Brent, Tae, Seth, Kevin PROCEDURE/MATERIAL: Inconel/stainless steel  
 WORK ORDER#: \_\_\_\_\_ JOB LOCATION: \_\_\_\_\_  
 SYSTEM #: \_\_\_\_\_ RECORDER S/N#: R-91, RC-088, RC-074, RC-079  
 I.S.O. LINE #: \_\_\_\_\_ RC-070, RC-093, RC-037, RC-092, R-94, R-93, R-95  
 SPOOL #: \_\_\_\_\_  
 FIELD WELD #: \_\_\_\_\_  
 CHART #: 11 Records TOTAL WELDS: \_\_\_\_\_ TOTAL TC'S: 101



WELD IDENTIFICATION AND THERMOCOUPLE LAYOUT  
 THIS I.S.O. DRAWING IS COMPLETED BY THE PWHT TECHNICIAN

\_\_\_\_\_  
 TECHNICIAN

\_\_\_\_\_  
 DATE



## PWHT QUALITY CONTROL SHEET

CUSTOMER Major Tool W/O# \_\_\_\_\_

DATE: 2-9-06

1. Customer has given specific direction to D.L. Ricci, as to which welds need PWHT. Heat Treating Documentation packet has been given to the technician. The technician has reviewed the procedure.  
Herk Jacobs  
Technician
2. Drawings of each spool piece have been completed. Each drawing shows the spool piece number and describes each weld on the spool.  
Herk Jacobs  
Technician
3. Welds are wrapped and troubleshooting is complete. All zones are working properly. Technician has reviewed procedure (ramp rate, soak temperature, soak time).  
Herk Jacobs  
Technician
4. Welds are at soak temperature. Technician has reviewed chart (checking ramp rate up to soak).  
Herk Jacobs  
Technician
5. When soak is complete, technician has reviewed chart, checked soak time/temperature and reviewed ramp rate to completion.  
Herk Jacobs  
Technician
6. PWHT is complete. Technician has reviewed chart and everything is correct. (Do not unwrap welds until this stage is signed off)  
Herk Jacobs  
Technician
7. Unwrap welds. Take hardness test if required and record results.  
\_\_\_\_\_  
Technician