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, Bill, Joe, Seth, Norm 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.

HEAT CYCLE: 300° at 50°/per 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 70 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 70 min
Till about 500° and then the parts fell out of soak and then we start to ramp the parts Down 50° per 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 and we would hold each step till we were within 10° Top to Bottom

* TO INCLUDE ALL INFORMATION RELEVANT TO PWHT CYCLE*

Herb Jacobs 2/11/06
TECHNICIAN DATE

CUSTOMER ACCEPTANCE*: _____ DATE: 11/16/2006
* SIGNATURE ACCEPTS ABOVE HEAT CYCLE PROCEDURE

K Drive: Job Sheet- Excel File

D.L. RICCI CORP.
TIME TEMPERATURE TABULATIONS

CUSTOMER: _____

DATE: 2-6 CUSTOMER CONTACT: _____

TECHNICIAN: _____ PROCEDURE/ MATERIAL: _____

WORK ORDER#: _____ JOB LOCATION: _____

SYSTEM #: _____ RECORDER SERIAL #: AH03XC079

I.S.O. LINE #: _____

SPOOL #: _____

FIELD WELD #: _____

CHART #: 3 @ TOTAL WELDS: _____ TOTAL TC'S: 12

TIME/TC	1	2	3	4	5	6	7	8	9	10	11	12
14:12							55	68	69	70	72	70
14:42	129	129	130	127	128	126	130	124	128	128	126	126
15:12	136	138	141	142	146	141	150	147	143	138	134	142
15:42	135	136	137	141	147	135	147	143	139	133	131	138
16:12	136	135	137	144	145	131	144	141	137	131	132	136
16:42	161	161	162	168	170	156	169	165	161	156	156	161
17:12	175	174	176	176	177	173	179	176	175	174	171	174
17:42	172	172	173	173	174	170	174	170	171	171	169	170
18:12	172	173	173	170	176	170	172	171	171	170	169	171
18:42	173	172	173	170	175	170	172	170	171	170	169	170
19:12	172	172	173	170	173	170	172	170	171	171	169	170
19:42	176	176	176	173	177	172	174	172	174	173	171	172
20:12	200	200	202	198	199	198	199	197	199	198	196	196
20:42	224	224	225	222	223	221	223	222	223	222	220	222
21:12	222	222	223	222	227	220	223	223	221	220	218	220
21:42	246	245	246	247	252	244	249	249	246	245	243	245
22:12	271	270	271	271	276	269	273	272	271	270	268	269
22:42	287	285	285	286	294	285	289	287	284	284	282	284
23:12	312	310	311	311	318	310	314	310	310	308	307	309
23:42	322	322	323	320	329	319	321	321	321	320	318	321
00:12	336	335	336	334	343	334	336	335	336	335	333	335
00:42	361	360	362	359	368	359	361	360	361	359	358	360
1:12	382	380	383	380	386	378	382	381	379	378	376	381
1:42	407	406	408	405	410	403	406	405	404	402	401	404
2:12	423	422	423	421	426	420	422	421	421	418	419	420
2:42	448	446	448	445	455	444	447	445	446	444	443	444
3:12	472	471	472	470	473	468	471	470	470	468	468	468
3:42	488	488	489	487	491	485	488	487	487	485	485	487
4:12	514	513	514	512	516	510	513	511	512	510	510	511

* 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.

2nd Time

D.L. RICCI CORP.
PWHT JOB ANALYSIS SHEET

CUSTOMER: Major Tool
JOBSITE: Indianapolis Indiana
DATE: 2-9-06
CUSTOMER CONTACT: Doug 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 then 212° we started ramping up the vessel and ports. till we got the ports back up to 300° & vessel Back up To 707° and than held ports at Temp for 21 hours & The vessel for 18 hours so the both had a total of 42 hours of soak

HEAT CYCLE: Ports From 200° to 300° at 50°/per 120 min. then Held 21 hours
vessel 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 vessal at 50° per hour Till 500° to ~~the~~ keep ports in soak for 3 extra hours so we would have 42 hours on both Ports 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 uptill we were and 200° Then we shoot off machs. and let cool.
* TO INCLUDE ALL INFORMATION RELEVANT TO PWHT CYCLE*

Herb Vorden 2/11/06
TECHNICIAN DATE

CUSTOMER ACCEPTANCE*: _____ DATE: 11/16/2006
* SIGNATURE ACCEPTS ABOVE HEAT CYCLE PROCEDURE

K Drive: Job Sheet- Excel File

D.L. RICCI CORP.
WELD AND THERMOCOUPLE IDENTIFICATION

DATE: 2-9-06 CUSTOMER CONTACT: Doug McCorkle

TECHNICIAN: Eric, Herb, Bret, Joe, Seth, Kevin PROCEDURE/ MATERIAL: Inconel/stainless Steel

WORK ORDER#: _____ JOB LOCATION: _____

SYSTEM #: _____ RECORDER S/N#: R-91, Rc-088, Rc-074, Rc-079 Rc-070, Rc-093, Rc-037, Rc-092, R-94, R-93, R-95

I.S.O. LINE #: _____

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

_____

TECHNICIAN DATE

D.L.Ricci Corp.

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 as reviewed the procedure.

Technician

2. Drawings of each spool piece have been completed. Each drawing shows the spool piece number and describes each weld on the spool.

Technician

3. Welds are wrapped and troubleshooting is complete. All zones are working properly. Technician has reviewed procedure (ramp rate, soak temperature, soak time).

Technician

4. Welds are at soak temperature. Technician has reviewed chart (checking ramp rate up to soak).

Technician

5. When soak is complete, technician has reviewed chart, checked soak time/temperature and reviewed ramp rate to completion.

Technician

6. PWHT is complete. Technician has reviewed chart and everything is correct. (Do not unwrap welds until this stage is signed off)

Technician

7. Unwrap welds. Take hardness test if required and record results.

Technician

D.L. RICCI CORP.
TIME TEMPERATURE TABULATIONS

CUSTOMER: _____

DATE: 2-7 CUSTOMER CONTACT: _____

TECHNICIAN: _____ PROCEDURE/ MATERIAL: _____

WORK ORDER#: _____ JOB LOCATION: _____

SYSTEM #: _____ RECORDER SERIAL #: AH03XC079

I.S.O. LINE #: _____

SPOOL #: _____

FIELD WELD #: _____

CHART #: 3 TOTAL WELDS: _____ TOTAL TC'S: 12

TIME/TC	1	2	3	4	5	6	7	8	9	10	11	12
4:42	530	529	530	528	532	527	530	529	530	527	526	528
5:12	555	555	555	553	557	551	555	553	554	552	551	552
5:42	573	573	573	570	573	569	572	570	571	569	569	570
6:12	595	595	595	593	596	591	595	595	594	592	591	592
6:42	620	620	620	618	620	616	620	618	619	617	616	617
7:12	639	639	639	636	639	634	637	636	637	635	634	634
7:42	664	664	665	661	664	659	662	660	662	660	659	660
8:12	678	677	675	674	675	671	676	674	674	673	672	672
8:42	703	702	702	699	700	696	701	699	700	698	697	700
9:12	703	703	704	702	702	700	702	700	702	700	699	700
9:42	703	703	703	700	702	700	702	701	702	700	699	700
10:12	708	707	708	706	707	704	708	706	707	706	705	706
10:42	710	709	710	707	709	707	709	707	709	708	707	708
11:12	710	710	710	709	709	707	709	708	709	708	707	708
11:42	710	710	710	707	709	707	709	708	709	708	707	708
12:42	710	710	711	707	709	707	709	708	709	708	707	708
13:42	711	710	711	708	709	707	709	708	709	708	707	708
14:42	710	710	711	708	709	707	709	707	709	709	706	708
15:42	710	710	711	707	709	707	709	707	709	708	706	708
16:42	710	710	710	707	709	707	709	708	709	708	707	708
17:42	710	710	711	708	709	707	709	708	709	708	707	708
18:42	711	710	711	708	709	707	709	708	709	708	706	708
19:42	710	710	711	707	709	707	709	708	709	708	707	708
20:42	710	710	711	708	709	706	704	708	709	708	706	708
21:42	710	710	710	708	708	707	709	708	709	708	707	708
22:42	710	710	710	708	709	707	709	708	709	708	707	708
23:42	710	710	711	707	709	707	709	708	709	708	706	708
00:42	710	710	711	707	709	707	709	708	709	708	706	709
01:42	710	710	711	708	709	707	709	708	709			

* 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

D.L. RICCI CORP.
TIME TEMPERATURE TABULATIONS

CUSTOMER:
DATE: 2-8 **CUSTOMER CONTACT:**
TECHNICIAN: **PROCEDURE/ MATERIAL:**
WORK ORDER#: **JOB LOCATION:**
SYSTEM #: **RECORDER SERIAL #:** AH 03XC079
I.S.O. LINE #:
SPOOL #:
FIELD WELD #:
CHART #: 3 4 **TOTAL WELDS:** **TOTAL TC'S:** 12

(Margin notes: "8:30 24P↓ vessil"; "Started going up")

TIME/TC	1	2	3	4	5	6	7	8	9	10	11	12
0242	710	710	711	707	709	707	709	708	709	708	706	708
0342	710	710	711	707	709	707	710	708	709	707	707	70
442	710	710	711	707	709	707	709	708	709	708	706	70
542	710	710	711	708	709	707	709	708	709	708	706	70
6:42	710	710	711	707	709	707	709	708	709	708	706	70
7:42	710	710	711	707	709	707	709	708	709	708	708	70
8:42	704	703	704	700	704	697	701	699	700	699	698	70
9:12	678	677	679	675	678	679	676	675	676	675	674	67
9:42	654	652	654	651	655	649	652	650	652	651	648	65
10:12	630	628	629	626	631	624	627	625	627	626	625	62
10:42	605	603	604	602	607	600	603	602	602	601	600	60
11:12	585	580	582	586	593	575	582	582	578	577	576	58
12:12	504	502	504	510	523	499	503	501	501	501	498	50
13:12	469	457	462	471	481	449	450	463	452	449	448	46
14:12	407	402	403	411	422	400	402	401	402	400	399	40
15:12	387	379	383	386	397	373	381	386	376	365	367	38
16:12	353	352	353	350	362	349	352	350	351	350	349	35
17:12	347	347	346	346	345	342	346	346	342	339	337	34
18:12	308	307	303	313	320	299	302	302	301	300	298	30
1912	301	301	302	299	317	298	301	300	299	298	296	29
20:12	283	282	283	280	315	279	282	281	281	279	279	28
21:12	265	264	262	265	291	250	258	261	253	252	248	26
22:12	245	243	245	243	266	240	245	245	241	234	236	24
23:12	222	218	219	223	237	205	210	217	218	202	200	22
00:12	202	201	202	204	217	199	202	201	201	200	199	20
0126	202	201	202	199	211	200	202	200	201	202	199	20
2:26	242	241	242	239	247	239	241	240	241	240	238	24
3:26	285	285	288	285	281	283	286	285	284	282	281	28
4:24	322	323	321	322	327	317	322	321	320	319	319	32

* 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 03XC 079

I.S.O. LINE #: _____

SPOOL #: _____

FIELD WELD #: _____

CHART #: 3 **TOTAL WELDS:** _____ **TOTAL TC'S:** 12

TIME/TC	1	2	3	4	5	6	7	8	9	10	11	12
5:26	364	369	364	364	367	362	365	364	365	361	361	365
6:26	407	406	405	404	408	402	407	404	404	402	402	403
7:26	454	453	455	455	451	454	453	453	452	452	449	452
8:26	497	496	495	495	499	493	496	495	495	494	493	496
9:26	540	536	530	537	540	535	530	537	538	536	535	536
10:26	581	581	581	578	582	576	580	578	580	577	577	578
11:26	623	620	623	620	623	618	621	619	622	619	619	619
12:26	661	662	664	660	660	656	661	658	661	658	657	656
13:26	703	703	704	700	701	699	702	700	702	700	699	70
14:26	710	710	710	707	709	708	709	708	708	707	706	708
15:26	710	710	711	707	708	705	709	708	708	706	706	708
16:26	710	710	710	707	709	707	709	708	709	708	706	70
17:26	710	710	711	707	709	707	709	709	709	708	707	70
18:26	710	710	711	707	709	707	710	708	709	708	707	70
19:26	710	710	711	708	709	707	709	708	709	708	707	709
20:26	710	710	711	708	709	707	709	708	709	708	706	70
21:26	710	709	710	707	709	707	709	708	709	708	706	70
22:26	710	710	710	708	708	707	709	708	709	708	706	70
23:26	710	710	710	708	709	707	709	708	709	708	706	70
00:26	710	709	711	707	708	707	709	708	709	708	707	70
1:26	710	709	712	707	708	707	709	708	709	708	707	70
2:26	710	710	710	708	709	707	709	708	709	708	707	70
3:26	710	710	710	707	708	707	709	710	709	708	707	70
4:26	710	710	710	708	709	707	710	708	709	708	707	70
5:26	710	710	711	707	709	707	709	708	709	708	707	70
6:26	710	709	710	707	709	707	709	708	709	708	707	708
7:26	711	709	711	708	709	707	709	708	709	708	707	708
8:26	677	677	679	675	676	673	677	675	676	675	674	671
9:26	633	632	633	641	635	627	632	638	633	630	629	631

* 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 #:** _____

I.S.O. LINE #: _____

SPOOL #: _____

FIELD WELD #: _____

CHART #: 3 **TOTAL WELDS:** _____ **TOTAL TC'S:** 12

TIME/TC	1	2	3	4	5	6	7	8	9	10	11	12
10:26	589	584	586	587	594	579	585	586	582	580	579	588
11:26	505	503	503	513	511	496	501	498	502	501	499	499
12:26	470	465	462	475	469	452	461	464	456	453	452	468
13:26	405	403	403	414	400	399	402	401	402	400	399	408
14:26	391	390	389	391	391	381	389	390	385	377	377	391
15:26	343	338	330	348	330	303	318	331	312	300	303	340
16:26	309	296	297	306	292	284	291	288	288	283	282	298
17:26	264	262	254	271	249	234	245	252	240	229	234	264
18:26	233	233	226	239	216	199	208	219	203	192	198	234
19:26	207	209	203	212	188	174	182	191	176	168	174	208
20:00	194	196	191	194	176	162	170	178	165	157	162	196

* 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.
5001 Moundview Drive
Red Wing, Minnesota 55066
Phone: 651/388-8661 Fax: 651/388-0002

CERTIFICATE OF CALIBRATION

MODEL:	AH3725-N00	SERIAL NO:	AH03XC079
THERMOCOUPLE TYPE:	K	RANGE:	0 - 2000 F
CALIBRATION DATE:	12/8/05	DUE DATE:	6/8/06

TEST EQUIPMENT USED:	THERMO-ELECTRIC E-2642		
MANUFACTURER:	Thermo - Electric	CALIBRATION DATE:	8/16/05
MODEL NO:	E - 2642	ACCURACY:	+/- 1 F
SERIAL NO:	008032		

AMBIENT TEMP: 70 HUMIDITY: 50% ZONE: 1

INPUT	AS FOUND	AS LEFT	ACCURACY
200	198	200	+/-10 DEG F
400	401	400	+/-10 DEG F
600	600	600	+/-10 DEG F
800	800	800	+/-10 DEG F
1000	1000	1000	+/-10 DEG F
1200	1199	1200	+/-10 DEG F
1400	1401	1400	+/-10 DEG F
1600	1600	1600	+/-10 DEG F
1800	1799	1800	+/-10 DEG F
2000	2000	2000	+/-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: Matt Wilson
SIGNATURE: Matt Wilson

PREHEAT AND STRESS RELIEVING EQUIPMENT

D.L. RICCI CORP.
WELD AND THERMOCOUPLE IDENTIFICATION

DATE: 1-31-06
TECHNICIAN: Eric, Herb, Brad, Joe, Seth, Kevin
WORK ORDER#:
SYSTEM #:

CUSTOMER CONTACT: Doug McCorkle
PROCEDURE/ MATERIAL: Inconel / Stainless Steel
JOB LOCATION: Major Tool shop
RECORDER S/N#: R-91, RC-088, RC-074, RC-079 RC-070, RC-093, RC-037, RC-092, R-94, R-93, R-95

I.S.O. LINE #:
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 Jacobs 2-11-06
TECHNICIAN DATE

D.L.Ricci Corp.

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.

Technician

2. Drawings of each spool piece have been completed. Each drawing shows the spool piece number and describes each weld on the spool.

Technician

3. Welds are wrapped and troubleshooting is complete. All zones are working properly. Technician has reviewed procedure (ramp rate, soak temperature, soak time).

Technician

4. Welds are at soak temperature. Technician has reviewed chart (checking ramp rate up to soak).

Technician

5. When soak is complete, technician has reviewed chart, checked soak time/temperature and reviewed ramp rate to completion.

Technician

6. PWHT is complete. Technician has reviewed chart and everything is correct. (Do not unwrap welds until this stage is signed off)

Technician

7. Unwrap welds. Take hardness test if required and record results.

Technician