DUKE ENERGY.

Mandy Hare
Nuclear Support Services Manager
Catawba Nuclear Station

Duke Energy
CN03CH | 4800 Concord Rd
York, SC 29745

803.701.2218
Mandy.Hare@duke-energy.com

March 11, 2019
Serial: RA-19-0092

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Catawba Nuclear Station, Unit No. 1
Docket No. 50-413 / Renewed License No. NPF-35

Subject: Catawba Unit 1, Refuel 24 (C1R24) Inservice Inspection (ISI) and Steam Generator Inspection (SG-ISI) Report

Ladies and Gentlemen:

In accordance with Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Duke Energy is providing its Inservice Inspection (ISI) for Catawba Nuclear Station, Unit No. 1, Refuel 24 (C1R24). Also included is the Steam Generator Inservice Inspection (SG-ISI) Summary for Catawba Nuclear Station, Unit No. 1, Refuel 24 (C1R24).

Enclosure 1 contains the C1R24 Owner's Activity Summary Report.

Enclosure 2 contains the SG-ISI tube inspection report for C1R24.

This submittal contains no regulatory commitments. Should you have any questions concerning this letter, or require additional information, please contact Art Zaremba, Manager – Nuclear Fleet Licensing, at 980-373-2062.

Sincerely,

Mandy B. Hare

Mandy Hare
Nuclear Support Services Manager, Catawba Nuclear Station

Enclosure(s):
1. Owner's Activity Summary Report
   For Refueling Outage 24

2. Steam Generator Inservice Inspection Report
   For Refueling Outage 24

NDE

cc: (w/ all enclosures)

Michael Mahoney, NRC Project Manager, NRR

cc: (without SG data)

Catherine Haney, NRC Regional Administrator, Region II

J.D. Austin, NRC Resident Inspector, Catawba Nuclear Station

Enclosure 1

Owner's Activity Summary Report for Refueling Outage 24

DUKE ENERGY

INSERVICE INSPECTION SUMMARY REPORT UNIT 1 CATAWBA 2018 REFUELING OUTAGE C1R24 (Outage 3)

Location: 4800 Concord Road, York, SC, 29745

NRC Docket No. 50-413

Commercial Service Date: June 29, 1985

Owner: Duke Energy
526 South Church St.
Charlotte, NC 28201-1006

Revision 0

Originated By: _____ ***Date*** 2/26/19
Austin C. Keller

Checked By: _____ ***Date*** 2/26/19
Timothy D. Myers

Approved By: _____ ***Date*** 2/26/19
Mark A. Pyne

CASE
N-532-5

FORM OAR-1 OWNER'S ACTIVITY REPORT

Report Number: Owner's Activity Report for Refueling Outage C1R24

Plant: Catawba Nuclear Station, 4800 Concord Road, York, SC 29745

Unit No. 1 (if applicable) Commercial service date: June 29, 1985 Refueling outage no.: C1R24

Current inspection interval: Fourth Inspection Interval (ISI), Third Inspection Interval (Containment ISI) (1st, 2nd, 3rd, 4th, other)

Current inspection period: Second Inspection Period (ISI and Containment ISI) (1st, 2nd, 3rd)

Edition and Addenda of Section XI applicable to the inspection plans: ASME Section XI 2007 Edition through 2008 Addenda

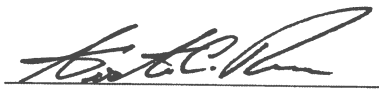
Date and revision of inspection plans: See Attachment - Page 2

Edition and Addenda of Section XI applicable to repair/replacement activities, if different than the inspection plans: Same as above

Code Cases used for inspection and evaluation: The following Code Cases are permitted by the ISI Plan and Addenda: 4th Interval: N-513-3, N-532-5, N-586-1, N-600, N-613-1, N-639, N-643-2, N-648-1, N-651, N-705, N-706-1, N-712, N-716-1, N-722-1, N-729-4, N-731, N-735, N-747, N-751, N-765, N-770-2, N-771, N-776, N-786-1, N-798, N-800, N-805, N-823, N-825, & N-845 (if applicable)

CERTIFICATE OF CONFORMANCE

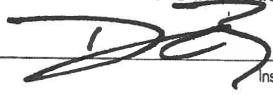
I certify that (a) the statements made in this report are correct; (b) the examinations and tests meet the Inspection Plan as required by the ASME Code, Section XI; and (c) the repair/replacement activities and evaluations supporting the completion of C1R24 (refueling outage number) conform to the requirements of Section XI.

Signed  Austin C. Keller, ISI Program Owner Date 2/26/19

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of South Carolina and employed by OneCIS Insurance Company Lynn, MA have inspected the items described in this Owner's Activity Report, and state that, to the best of my knowledge and belief, the Owner has performed all activities represented by this report in accordance with the requirements of Section XI.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the repair/replacement activities and evaluation described in this report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

 D. Mollet
Inspector's Signature

Commissions 15196 NR, A2, IS
National Board, State, Province, and Endorsements

Date 2/28/2019

Attachment

Catawba Unit 1 Refuel Outage 24, Inservice Inspection Report

Date and Revision of Inservice Inspection Plans:

I. Fourth Interval Inservice Inspection Plans

1. The following documents comprise the Catawba Nuclear Station 4th Interval Inservice Inspection Plan for Unit 1 (Class 1, 2, and 3 Components):

    a. Catawba Nuclear Station Unit 1 and Unit 2 – Fourth Interval Inservice Inspection Plan, Document #CISI-1462.10-0040-ISI PLAN, Rev. 4, dated 01/14/2019.

    b. Fourth Interval Inservice Inspection Outage Schedule Catawba Nuclear Station Unit 1, Document #CISI-1462.10-0040-UNIT 1, Rev. 1, dated 02/06/2019.

2. The following documents comprise the Catawba Nuclear Station 4th Interval Inservice Inspection Pressure Test Plan for Unit 1:

    a. Catawba Nuclear Station Units 1 and 2 Fourth Inspection Interval Inservice Inspection Pressure Test Plan, Document #CISI-1462.20.0040-PTPlan, Rev. 1, dated 07/13/2017, including the following addenda:

        i. CISI-1462.20-0040-C1-PT-003

II. Third Interval Containment Inservice Inspection Plan

1. The following document comprises the Catawba Nuclear Station 3rd Interval Containment Inservice Inspection Plan for Unit 1 (Class MC):

    a. Catawba Nuclear Station Units 1 and 2 - Third Interval Containment Inservice Inspection Plan, Document #CN-ISIC3-1042-0001, Rev. 8, dated 12/20/2018.

TABLE 1
ITEMS WITH FLAWS OR RELEVANT CONDITIONS THAT REQUIRED EVALUATION FOR CONTINUED SERVICE

Examination Category and Item Number	Item Description	Evaluation Description
F-A / F1.12	C1-07668 / 1-R-NV-1932	VT-3 examination revealed excess U-bolt material outside the locking nuts bent. WR# 20127298 was written to remove excess material on the outside of the upper and lower locking nuts. Engineering Evaluation found support to be acceptable. Reference NCR# 02245099.
F-A / F1.30	C1-06030 / 1-R-KC-0404	VT-3 examination revealed a loose jam nut. WR# 20126813 was written to tighten loose jam nut. Engineering Evaluation found support to be acceptable. Reference NCR# 02244153.
B-P / B15.10	Boric acid residue found on NC Pump 1C Seal Housing during ISI Pressure Test Zone, 1NC-001L-A	Area identified in NCR# 02247880 was evaluated by Engineering and found to be acceptable.
B-P / B15.10	Boric acid residue found on Incore Instrumentation Tubing during ISI Pressure Test Zone, 1NC-001L-A	Area identified in NCR# 02247870 was evaluated by Engineering and found to be acceptable.
B-P / B15.10	Boric acid residue found on NC Pump 1D Seal Housing and intermittent around the circumference of the pump during ISI Pressure Test Zone, 1NC-001L-A	Area identified in NCR# 02247865 was evaluated by Engineering and found to be acceptable.
C-H / C7.10	Boric acid residue found on mechanical joint 1ND-1 MJ-2 (Class B Bolted Connection - IWA-5241(f))	Area identified in NCR# 02245111 was evaluated by Engineering and found to be acceptable.
C-H / C7.10	Boric acid residue found on the 1A and 1B ND Heat Exchanger Flanges (Class B Bolted Connection - IWA-5241(f))	Areas identified in NCR# 02245630 was evaluated by Engineering and found to be acceptable.
C-H / C7.10	Boric acid residue found during ISI Pressure Test Zone, 1NV-006L-B	Areas identified in NCR# 02147044 were evaluated by Engineering and found to be acceptable.
C-H / C7.10	Boric acid residue found during ISI Pressure Test Zone, 1NV-003L-B	Areas identified in NCR# 02141397 were evaluated by Engineering and found to be acceptable.

TABLE 2
ABSTRACT OF REPAIR/REPLACEMENT ACTIVITIES REQUIRED FOR CONTINUED SERVICE

Code Class	Item Description	Description of Work	Date Completed	Repair / Replacement Plan Number
3	Nuclear Sampling System weld 1492RN398-25	Repair weld 1492RN398-25 due to lack of penetration on the weld root	11/26/2018	20106077-01

Enclosure 2

Steam Generator Inservice Inspection Report for Refueling Outage 24

Steam Generator
In-service Inspection Summary Report

Catawba Nuclear Station Unit 1
C1R24
Fall Outage 2018

Location: Catawba Nuclear Station, 4800 Concord Road, York, SC 29745

NRC Docket No. 50-413
National Board No. 130

Commercial Service Date: June 29, 1985

Owner: Duke Energy Carolinas, LLC
526 South Church St.
Charlotte, N.C. 28202

Revision 0

Prepared By: Dan Mayes DBMayes Date: 2/5/2019

Checked By: Chuck Cauthen CCauthen Date: 2-5-2019

Approved By: Etienne Fonteneau EF Date: 2.5.2019

Document Completion Date: **2/19/2019**

CASE
N-532-5

FORM OAR-1 OWNER'S ACTIVITY REPORT

Report Number Owner's Activity Report for SG Inspection Outage C1R24

Plant Catawba Nuclear Station, 4800 Concord Road, York, SC 29745

Unit No. 1 (if applicable) Commercial service date, June 29,1985 Refueling outage no. C1R24

Current inspection interval 4th (1st, 2nd, 3rd, 4th, other)

Current inspection period 2nd (1st, 2nd, 3rd)

Edition and Addenda of Section XI applicable to the inspection plans 2007 Edition through 2008 Addenda

Date and revision of inspection plans 8-19-2015 Rev 0 (C-ISISG-0169.030.0040)

Edition and Addenda of Section XI applicable to repair/replacement activities, if different than the inspection plans Same as plan

Code Cases used for inspection and evaluation: N-532-5 (if applicable, including cases modified by Case N-532 and later revisions)

CERTIFICATE OF CONFORMANCE

I certify that (a) the statements made in this report are correct; (b) the examinations and tests meet the Inspection Plan as required by the ASME Code, Section XI; and (c) the repair/replacement activities and evaluations supporting the completion of C1R24 (refueling outage number) conform to the requirements of Section XI.

Signed DB Mayes Dan Mayes, Principal Nuclear Engineer Date 2/7/2019

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of South Carolina and employed by OneCIS Insurance Company of Lynn, MA have inspected the items described in this Owner's Activity Report, and state that, to the best of my knowledge and belief, the Owner has performed all activities represented by this report in accordance with the requirements of Section XI.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the repair/replacement activities and evaluation described in this report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Dustin Mallet Inspector's Signature Commissions 15196,SC#363,AI,IS,I,N,R, National Board, State, Province, and Endorsements

Date 02/19/2019

TABLE 1
ITEMS WITH FLAWS OR RELEVANT CONDITIONS THAT REQUIRED EVALUATION FOR CONTINUED SERVICE

Examination Category and Item Number	Item Description	Evaluation Description
Category B-Q B16.20.001 B16.20.002 B16.20.003 B16.20.004	Steam Generator Tubing in U-Tube Design	No ASME Section XI Acceptance Requirement Exceeded (Reference Attached Inspection Report)

TABLE 2
ABSTRACT OF REPAIR/REPLACEMENT ACTIVITIES REQUIRED FOR CONTINUED SERVICE

Code Class	Item Description	Description of Work	Date Completed	Repair/Replacement Plan Number
None	None	None	None	None

Catawba C1R24 Steam Generator Tube Inspection Report

Pursuant to Catawba technical specification 5.6.8 the following information is provided:

a. The scope of inspections performed on each SG

Bobbin Inspection

- *Full length bobbin probe inspection of 50% tubes. The 50% sample contained:*
  - *All tubes with previous indications, e.g., wear, DNT, PLP, etc.*
  - *All tubes surrounding plugged tubes one tube deep.*
  - *Periphery tubes two rows deep in the hot leg and cold leg (outer perimeter and open lane).*
  - *For tubes plugged last inspection for loose parts, bound the area two tubes deep in the area of interest.*
  - *50% of rows 5-6 full length.*

Array Inspection

- *100% of periphery tubes (5 tubes in from periphery) with array probe from top of tubesheet to the first support in both hot leg (TEH to 01H) and cold leg (TEC to 01C).*
- *Special interest inspections were also performed on selected indications.*

Visual Inspection

- *Previously installed plugs*
- *Bowl cladding inspection*
- *Foreign object search and retrieval (FOSAR) of the tubesheet in all 4 steam generators.*

b. Degradation mechanisms found

Degradation found included wear at support structures and presumed wear from foreign objects.

c. Non-destructive examination techniques utilized for each degradation mechanism

The bobbin probe was utilized for the detection of wear at support structures and freespan locations and to size wear at support structures. The array probe was used to size the presumed foreign object wear.

d. Location, orientation (if linear), and measured sizes (if available) of service induced indications.

There were 281 indications of fanbar (FB) wear reported. Thirty-four (34) of these indication were newly reported. The deepest of fanbar wear indication was 30% TW. The average growth rate was -0.9 % TW/EFPY. There were five (5) indications of lattice grid (LG) wear reported. There were no newly reported lattice grid wear indications. The deepest of lattice grid wear indication was 21% TW. The average growth rate for lattice grid wear was also negative. There were eighteen (18) indications of presumed foreign object wear with no part present reported. The deepest presumed foreign object wear was 26% TW. One of these indications was newly reported, its depth was 21% TW.

The complete listing for service induced indications is attached.

e. Number of tubes plugged during the inspection outage for each degradation mechanism

There were no tubes plugged in the 1A, 1B, 1C, or 1D SGs.

f. Total number and percentage of tubes plugged to date, and the effective plugging percentage in each steam generator.

Steam Generator[1]	***1A***	***1B***	***1C***	***1D***	***Total***
Prior to C1R24	*8*	*0*	*24*	*17*	*49*
C1R24	*0*	*0*	*0*	*0*	*0*
Total	*8*	*0*	*24*	*17*	*49*
% Plugged/Effective Plugging %	*0.12%*	*0.0%*	*0.36%*	*0.26%*	*0.18%*

1= There are 6633 tubes per steam generator

g. The results of condition monitoring, including the results of tube pulls and in-situ testing.

The cumulative SG EFPY for EOC-22(C1R22) was 17.38, EOC-23 (C1R23) was 18.73 and EOC-24 (C1R24) was 20.21.

As of EOC-24, the Catawba steam generators had operated 18.73 EFPY since the first in-service inspection after replacement. In total, the Catawba steam generators had operated 20.21 EFPY since replacement.

Condition monitoring structural and leakage integrity were met for fanbar, lattice grid and presumed foreign object wear.

An NDE maximum depth call of 49.0 %TW or less for fanbar wear is sufficient to demonstrate a minimum degraded tube burst pressure of 3ΔP, 4050 psi, at 0.95 probability with 50% confidence. The worst case depth call for fanbar wear observed during the inspection was an NDE depth of 30%TW.

An NDE maximum depth call of 49.0 %TW or less for lattice grid wear is sufficient to demonstrate a minimum degraded tube burst pressure of 3ΔP, 4050 psi, at 0.95 probability with 50% confidence. The worst case depth call for lattice grid wear observed during the inspection was an NDE depth of 11%TW.

An NDE maximum depth call of 51.8%TW or less for FO wear is sufficient to demonstrate a minimum degraded tube burst pressure of 3ΔP, 4050 psi, at 0.95 probability with 50% confidence. The worst case depth call for FO wear observed during the inspection was an NDE depth of 26%TW.

During FOSAR, a total of 75 metal objects were found with 32 removed. All foreign objects that were not removed have a technical evaluation demonstrating that tube integrity will be met through the next scheduled inspection at C1R27. There was no wear was associated with any foreign object.

No degradation was detected in the plug visual or bowl cladding inspections.

No in-situ tests or tube pulls were performed.

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX
56	57	.12	74	PCT	6	P5	FB4	.86		WAR					TEC	TEH	.560	ZBAHS	5	H	99
114	63	.33	255	PCT	14	P5	FB7	1.73		WAR					TEC	TEH	.560	ZBAHS	2	H	159
73	64	.20	97	PCT	9	P5	FB6	-.64		WAR					TEC	TEH	.560	ZBAHS	2	H	152
109	66	.23	80	PCT	10	P5	FB7	-1.75		WAR					TEC	TEH	.560	ZBAHS	2	H	193
55	70	.19	44	PCT	8	P5	FB4	-.91		WAR					TEC	TEH	.560	ZBAHS	6	H	91
61	70	.25	237	PCT	11	P5	FB4	.69		WAR					TEC	TEH	.560	ZBAHS	5	H	57
83	72	.28	90	PCT	12	P5	FB5	-.11		WAR					TEC	TEH	.560	ZBAHS	2	H	24
89	72	.43	267	PCT	17	P5	FB5	.10		WAR					TEC	TEH	.560	ZBAHS	2	H	21
89	72	.45	90	PCT	17	P5	FB6	-.04		WAR					TEC	TEH	.560	ZBAHS	2	H	21
111	74	.30	62	PCT	12	P5	FB4	.91		WAR					TEC	TEH	.560	ZBAHS	14	H	39
80	75	.25	59	PCT	10	P5	FB4	-1.02		WAR					TEC	TEH	.560	ZBAHS	13	H	33
114	75	.25	241	PCT	10	P5	FB5	1.67		WAR					TEC	TEH	.560	ZBAHS	13	H	34
91	76	.28	65	PCT	11	P5	FB6	.97		WAR					TEC	TEH	.560	ZBAHS	14	H	29
91	76	.26	40	PCT	11	P5	FB7	.69		WAR					TEC	TEH	.560	ZBAHS	14	H	29
51	78	.15	83	PCT	6	P5	01H	-1.70		WAR					TEC	TEH	.560	ZBAHS	13	H	64
55	78	.19	66	PCT	8	P5	FB4	1.60		WAR					TEC	TEH	.560	ZBAHS	13	H	63
89	78	.26	245	PCT	10	P5	FB5	-.82		WAR					TEC	TEH	.560	ZBAHS	13	H	15
101	78	.25	78	PCT	10	P5	FB4	-1.58		WAR					TEC	TEH	.560	ZBAHS	13	H	12
103	78	.33	78	PCT	13	P5	FB5	-1.01		WAR					TEC	TEH	.560	ZBAHS	14	H	12
92	79	.27	258	PCT	12	P5	FB4	-.64		WAR					TEC	TEH	.560	ZBAHS	11	H	258
81	80	.17	254	PCT	8	P5	FB7	-.76		WAR					TEC	TEH	.560	ZBAHS	11	H	255
89	80	.27	285	PCT	12	P5	FB5	-1.06		WAR					TEC	TEH	.560	ZBAHS	11	H	253
91	80	.36	113	PCT	13	P5	FB6	1.76		WAR					TEC	TEH	.560	ZBAHS	12	H	237
88	81	.15	61	PCT	7	P5	FB5	-1.57		WAR					TEC	TEH	.560	ZBAHS	11	H	243
90	81	.13	92	PCT	5	P5	FB5	-1.56		WAR					TEC	TEH	.560	ZBAHS	12	H	228
94	81	.14	89	PCT	6	P5	FB5	1.72		WAR					TEC	TEH	.560	ZBAHS	11	H	244
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX
49	82	.21	278	PCT	9	P5	FB2	.90		WAR					TEC	TEH	.560	ZBAHS	14	H	84
77	82	.26	86	PCT	10	P5	FB5	-.13		WAR					TEC	TEH	.560	ZBAHS	12	H	226
91	82	.25	90	PCT	11	P5	FB4	1.13		WAR					TEC	TEH	.560	ZBAHS	11	H	237
99	82	.22	272	PCT	10	P5	FB4	-1.19		WAR					TEC	TEH	.560	ZBAHS	11	H	235
107	82	.38	269	PCT	15	P5	FB5	-1.12		WAR					TEC	TEH	.560	ZBAHS	11	H	233
102	83	.25	77	PCT	11	P5	FB5	1.21		WAR					TEC	TEH	.560	ZBAHS	11	H	229
102	83	.20	254	PCT	9	P5	FB6	-1.13		WAR					TEC	TEH	.560	ZBAHS	11	H	229
91	84	.34	265	PCT	14	P5	FB4	-.86		WAR					TEC	TEH	.560	ZBAHS	11	H	222
95	84	.23	246	PCT	10	P5	FB4	1.18		WAR					TEC	TEH	.560	ZBAHS	11	H	221
100	85	.33	92	PCT	14	P5	FB4	1.40		WAR					TEC	TEH	.560	ZBAHS	11	H	214
95	86	.23	65	PCT	10	P5	FB4	-.72		WAR					TEC	TEH	.560	ZBAHS	11	H	207
95	88	.20	105	PCT	8	P5	FB4	-.98		WAR					TEC	TEH	.560	ZBAHS	12	H	182
77	90	.23	76	PCT	10	P5	FB5	-1.24		WAR					TEC	TEH	.560	ZBAHS	11	H	187
108	93	.17	248	PCT	8	P5	FB5	1.94		WAR					TEC	TEH	.560	ZBAHS	11	H	164
96	109	.19	93	PCT	8	P5	FB5	1.95		WAR					TEC	TEH	.560	ZBAHS	12	H	65
69	112	1.13	60	PCT	21	207	07H	.53				.22	.22		07H	07H	.560	ZYAX2	27	H	366
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX
10	11	.29	121	PCT	11	207	TSH	.22				.17	.20		01H	TEH	.560	ZYAX2	30	H	96
73	18	.39	83	PCT	17	74	TSH	.19				.20	.23		01H	TEH	.560	ZYAX2	29	H	184
75	18	.54	122	PCT	15	207	TSH	.26				.15	.20		01H	TEH	.560	ZYAX2	30	H	182
72	19	.38	100	PCT	12	207	TSH	.07				.17	.14		01H	TEH	.560	ZYAX2	30	H	188
72	19	.38	128	PCT	12	207	TSH	.20				.19	.20		01H	TEH	.560	ZYAX2	30	H	188
81	60	.34	63	PCT	12	P5	FB5	-.81		WAR					TEC	TEH	.560	ZBAHS	2	H	194
89	60	.30	250	PCT	11	P5	FB5	-.91		WAR					TEC	TEH	.560	ZBAHS	2	H	192
89	60	.20	81	PCT	8	P5	FB6	-1.19		WAR					TEC	TEH	.560	ZBAHS	2	H	192
101	60	.31	243	PCT	12	P5	FB5	.97		WAR					TEC	TEH	.560	ZBAHS	2	H	189
99	62	.32	248	PCT	12	P5	FB5	1.09		WAR					TEC	TEH	.560	ZBAHS	2	H	184
80	63	.16	116	PCT	7	P5	FB5	-.56		WAR					TEC	TEH	.560	ZBAHS	2	H	170
100	63	.32	265	PCT	12	P5	FB6	-.82		WAR					TEC	TEH	.560	ZBAHS	2	H	177
100	63	.25	272	PCT	10	P5	FB6	1.39		WAR					TEC	TEH	.560	ZBAHS	2	H	177
95	64	.25	260	PCT	7	P5	FB5	-.81		WAR					TEC	TEH	.560	ZBAHS	1	H	154
100	67	.13	94	PCT	5	P5	FB4	-.92		WAR					TEC	TEH	.560	ZBAHS	2	H	134
69	70	.30	112	PCT	13	P5	FB4	.88		WAR					TEC	TEH	.560	ZBAHS	7	H	20
91	70	.19	87	PCT	8	P5	FB4	1.40		WAR					TEC	TEH	.560	ZBAHS	2	H	110
91	70	.30	77	PCT	11	P5	FB5	1.09		WAR					TEC	TEH	.560	ZBAHS	2	H	110
91	70	.54	79	PCT	18	P5	FB6	.05		WAR					TEC	TEH	.560	ZBAHS	2	H	110
97	70	.78	278	PCT	20	P5	FB5	-1.15		WAR					TEC	TEH	.560	ZBAHS	1	H	106
97	70	.25	97	PCT	7	P5	FB5	1.24		WAR					TEC	TEH	.560	ZBAHS	1	H	106
97	70	.50	99	PCT	14	P5	FB6	-1.35		WAR					TEC	TEH	.560	ZBAHS	1	H	106
97	70	.22	88	PCT	7	P5	FB6	1.12		WAR					TEC	TEH	.560	ZBAHS	1	H	106
97	70	.18	292	PCT	6	P5	FB8	1.37		WAR					TEC	TEH	.560	ZBAHS	1	H	106
103	70	.31	71	PCT	12	P5	FB4	-1.09		WAR					TEC	TEH	.560	ZBAHS	2	H	107
117	70	.23	270	PCT	7	P5	FB5	-.73		WAR					TEC	TEH	.560	ZBAHS	1	H	101
117	70	.41	96	PCT	12	P5	FB5	1.04		WAR					TEC	TEH	.560	ZBAHS	1	H	101
117	70	.42	92	PCT	12	P5	FB6	1.00		WAR					TEC	TEH	.560	ZBAHS	1	H	101
66	73	.30	109	PCT	11	P5	FB5	.86		WAR					TEC	TEH	.560	ZBAHS	11	H	84
82	75	.23	100	PCT	10	P5	FB4	-1.17		WAR					TEC	TEH	.560	ZBAHS	7	H	115
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX
96	75	.24	91	PCT	9	P5	FB6	-.67		WAR					TEC	TEH	.560	ZBAHS	8	H	113
95	76	.40	89	PCT	14	P5	FB4	-.87		WAR					TEC	TEH	.560	ZBAHS	8	H	121
95	76	.27	103	PCT	10	P5	FB5	-.97		WAR					TEC	TEH	.560	ZBAHS	8	H	121
95	76	.34	106	PCT	12	P5	FB6	-.80		WAR					TEC	TEH	.560	ZBAHS	8	H	121
65	80	.49	106	PCT	19	P5	FB4	1.02		WAR					TEC	TEH	.560	ZBAHS	12	H	153
74	83	.22	104	PCT	10	P5	FB4	1.35		WAR					TEC	TEH	.560	ZBAHS	7	H	154
82	83	.22	98	PCT	10	P5	FB4	1.22		WAR					TEC	TEH	.560	ZBAHS	7	H	156
86	83	.24	98	PCT	10	P5	FB4	1.20		WAR					TEC	TEH	.560	ZBAHS	7	H	157
86	83	.38	283	PCT	15	P5	FB5	1.47		WAR					TEC	TEH	.560	ZBAHS	7	H	157
98	83	.38	88	PCT	15	P5	FB5	.98		WAR					TEC	TEH	.560	ZBAHS	7	H	160
46	89	.18	97	PCT	9	P5	FB5	1.38		WAR					TEC	TEH	.560	ZBAHS	13	H	25
84	97	.36	236	PCT	14	P5	FB3	.96		WAR					TEC	TEH	.560	ZBAHS	10	H	57
93	100	.13	252	PCT	6	P5	07H	.56		WAR					TEC	TEH	.560	ZBAHS	10	H	94
106	103	.25	73	PCT	10	207	TSH	6.82				.15	.14		01H	TEH	.560	ZYAX2	30	H	25

| ROW | COL | VOLTS | DEG | IND | PER | CHN | LOCN | INCH1 | INCH2 | UTIL1 | UTIL2 | CRLEN | CRWID | CEG | BEGT | ENDT | PDIA | PTYPE | CAL | L | IDX |

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX
46	7	.26	100	PCT	10	207	TSH	9.31				.13	.14		01H	TEH	.560	ZYAX2	1	H	147
32	31	.10	99	PCT	4	P5	02H	.56		WAR					TEC	TEH	.560	ZBAHS	10	H	57
104	37	.17	84	PCT	10	203	TSH	11.90				.22	.20		01H	TEH	.560	ZYAX2	1	H	290
63	44	.18	281	PCT	8	P5	FB4	-1.92		WAR					TEC	TEH	.560	ZBAHS	8	H	259
80	51	.20	289	PCT	8	P5	FB3	-1.56		WAR					TEC	TEH	.560	ZBAHS	6	H	173
79	52	.46	86	PCT	20	P5	FB3	-2.00		WAR					TEC	TEH	.560	ZBAHS	5	H	168
70	55	.25	84	PCT	10	P5	FB5	-1.29		WAR					TEC	TEH	.560	ZBAHS	6	H	148
76	59	.25	63	PCT	13	P5	FB6	-1.72		WAR					TEC	TEH	.560	ZBAHS	5	H	106
80	59	.23	92	PCT	12	P5	FB5	1.85		WAR					TEC	TEH	.560	ZBAHS	5	H	107
86	59	.24	95	PCT	10	P5	FB4	1.61		WAR					TEC	TEH	.560	ZBAHS	6	H	116
75	60	.42	281	PCT	15	P5	FB4	-1.20		WAR					TEC	TEH	.560	ZBAHS	6	H	110
75	60	.23	119	PCT	9	P5	FB6	-1.09		WAR					TEC	TEH	.560	ZBAHS	6	H	110
79	60	.25	108	PCT	10	P5	FB4	-1.26		WAR					TEC	TEH	.560	ZBAHS	6	H	109
81	60	.12	83	PCT	7	P5	FB6	-.79		WAR					TEC	TEH	.560	ZBAHS	5	H	102
66	61	.32	82	PCT	13	P5	FB5	1.75		WAR					TEC	TEH	.560	ZBAHS	8	H	140
72	61	.40	111	PCT	15	P5	FB5	1.27		WAR					TEC	TEH	.560	ZBAHS	6	H	95
76	61	.39	89	PCT	14	P5	FB5	1.37		WAR					TEC	TEH	.560	ZBAHS	6	H	96
80	61	.29	94	PCT	11	P5	FB4	1.24		WAR					TEC	TEH	.560	ZBAHS	6	H	97
80	61	.39	91	PCT	14	P5	FB7	1.15		WAR					TEC	TEH	.560	ZBAHS	6	H	97
86	61	.30	275	PCT	11	P5	FB4	-1.10		WAR					TEC	TEH	.560	ZBAHS	6	H	98
86	61	.49	105	PCT	17	P5	FB5	-1.34		WAR					TEC	TEH	.560	ZBAHS	6	H	98
73	62	.18	113	PCT	10	P5	FB6	-.96		WAR					TEC	TEH	.560	ZBAHS	5	H	91
75	62	.56	107	PCT	19	P5	FB4	-1.15		WAR					TEC	TEH	.560	ZBAHS	6	H	93
79	62	.69	279	PCT	22	P5	FB4	-1.28		WAR					TEC	TEH	.560	ZBAHS	6	H	92
79	62	.23	99	PCT	9	P5	FB5	1.34		WAR					TEC	TEH	.560	ZBAHS	6	H	92
85	62	.17	82	PCT	9	P5	FB4	-.54		WAR					TEC	TEH	.560	ZBAHS	5	H	88
85	62	.17	81	PCT	9	P5	FB5	-.36		WAR					TEC	TEH	.560	ZBAHS	5	H	88
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX
91	62	.29	100	PCT	11	P5	FB4	1.20		WAR					TEC	TEH	.560	ZBAHS	6	H	89
91	62	.32	107	PCT	12	P5	FB5	-1.14		WAR					TEC	TEH	.560	ZBAHS	6	H	89
91	62	.40	103	PCT	15	P5	FB5	1.25		WAR					TEC	TEH	.560	ZBAHS	6	H	89
109	62	.16	115	PCT	9	P5	FB4	-1.11		WAR					TEC	TEH	.560	ZBAHS	5	H	82
94	63	.25	84	PCT	10	P5	FB6	-1.11		WAR					TEC	TEH	.560	ZBAHS	6	H	80
51	64	.19	104	PCT	9	P5	FB4	1.39		WAR					TEC	TEH	.560	ZBAHS	7	H	132
85	64	.21	87	PCT	11	P5	FB5	-.48		WAR					TEC	TEH	.560	ZBAHS	5	H	77
74	65	.28	285	PCT	11	P5	FB4	1.12		WAR					TEC	TEH	.560	ZBAHS	6	H	68
74	65	.39	268	PCT	14	P5	FB5	1.35		WAR					TEC	TEH	.560	ZBAHS	6	H	68
74	65	.25	92	PCT	10	P5	FB6	-1.62		WAR					TEC	TEH	.560	ZBAHS	6	H	68
82	65	.27	269	PCT	10	P5	FB5	1.71		WAR					TEC	TEH	.560	ZBAHS	6	H	70
3	66	.18	81	PCT	9	207	TSC	1.75				.17	.20		01C	TEC	.560	ZYAX2	5	C	24
79	66	.10	94	PCT	6	P5	FB8	.73		WAR					TEC	TEH	.560	ZBAHS	5	H	62
97	66	.54	100	PCT	18	P5	FB5	1.21		WAR					TEC	TEH	.560	ZBAHS	6	H	66
99	66	.26	106	PCT	13	P5	FB5	.97		WAR					TEC	TEH	.560	ZBAHS	5	H	61
99	66	.21	58	PCT	11	P5	FB6	.75		WAR					TEC	TEH	.560	ZBAHS	5	H	61
99	66	.14	82	PCT	8	P5	FB7	.63		WAR					TEC	TEH	.560	ZBAHS	5	H	61
2	67	.48	271	PCT	14	174	TSC	1.48				.26	.20		01C	TEC	.560	ZYAX2	6	C	28
98	67	.27	104	PCT	10	P5	FB4	1.38		WAR					TEC	TEH	.560	ZBAHS	6	H	62
98	67	.33	103	PCT	12	P5	FB5	1.26		WAR					TEC	TEH	.560	ZBAHS	6	H	62
98	67	.28	91	PCT	11	P5	FB7	-1.27		WAR					TEC	TEH	.560	ZBAHS	6	H	62
98	67	.51	283	PCT	18	P5	FB7	1.24		WAR					TEC	TEH	.560	ZBAHS	6	H	62
108	67	.42	103	PCT	15	P5	FB7	1.23		WAR					TEC	TEH	.560	ZBAHS	6	H	63
77	68	.19	81	PCT	10	P5	FB6	-.61		WAR					TEC	TEH	.560	ZBAHS	5	H	57
98	69	.31	105	PCT	12	P5	FB5	1.32		WAR					TEC	TEH	.560	ZBAHS	6	H	48
102	69	.26	113	PCT	10	P5	FB5	1.20		WAR					TEC	TEH	.560	ZBAHS	6	H	49
102	69	.74	96	PCT	23	P5	FB6	1.29		WAR					TEC	TEH	.560	ZBAHS	6	H	49
102	69	.25	73	PCT	10	P5	FB7	1.28		WAR					TEC	TEH	.560	ZBAHS	6	H	49
106	69	.30	95	PCT	11	P5	FB6	2.14		WAR					TEC	TEH	.560	ZBAHS	6	H	50
114	69	.29	106	PCT	11	P5	FB6	1.17		WAR					TEC	TEH	.560	ZBAHS	6	H	51

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX
1	70	.29	258	PCT	14	134	TSC	1.22				.24	.14		01C	TEC	.560	ZYAX2	6	C	27
93	70	.24	283	PCT	9	P5	FB4	-1.16		WAR					TEC	TEH	.560	ZBAHS	6	H	41
93	70	.21	93	PCT	8	P5	FB5	-1.13		WAR					TEC	TEH	.560	ZBAHS	6	H	41
93	70	.28	100	PCT	11	P5	FB5	1.14		WAR					TEC	TEH	.560	ZBAHS	6	H	41
93	70	.22	109	PCT	9	P5	FB6	1.22		WAR					TEC	TEH	.560	ZBAHS	6	H	41
95	70	.18	70	PCT	10	P5	FB4	-1.11		WAR					TEC	TEH	.560	ZBAHS	5	H	39
95	70	.16	59	PCT	9	P5	FB5	-1.11		WAR					TEC	TEH	.560	ZBAHS	5	H	39
95	70	.27	77	PCT	14	P5	FB6	.69		WAR					TEC	TEH	.560	ZBAHS	5	H	39
89	72	.32	88	PCT	12	P5	FB6	-.13		WAR					TEC	TEH	.560	ZBAHS	6	H	14
91	72	.22	81	PCT	11	P5	FB6	.07		WAR					TEC	TEH	.560	ZBAHS	5	H	13
95	72	.24	80	PCT	12	P5	FB4	.20		WAR					TEC	TEH	.560	ZBAHS	5	H	12
95	72	.20	90	PCT	10	P5	FB5	-.16		WAR					TEC	TEH	.560	ZBAHS	5	H	12
95	72	.28	90	PCT	14	P5	FB6	-.16		WAR					TEC	TEH	.560	ZBAHS	5	H	12
98	73	.28	106	PCT	11	P5	FB4	-.97		WAR					TEC	TEH	.560	ZBAHS	14	H	267
98	73	.33	111	PCT	13	P5	FB5	-1.07		WAR					TEC	TEH	.560	ZBAHS	14	H	267
88	75	.22	95	PCT	9	P5	FB5	-1.19		WAR					TEC	TEH	.560	ZBAHS	14	H	245
96	75	.19	92	PCT	8	P5	FB5	-1.27		WAR					TEC	TEH	.560	ZBAHS	14	H	247
104	75	.13	97	PCT	6	P5	FB4	-.59		WAR					TEC	TEH	.560	ZBAHS	14	H	249
110	75	.19	71	PCT	10	P5	FB6	.85		WAR					TEC	TEH	.560	ZBAHS	13	H	237
75	76	.53	99	PCT	19	P5	FB5	2.22		WAR					TEC	TEH	.560	ZBAHS	14	H	240
83	76	.97	276	PCT	29	P5	FB5	-.15		WAR					TEC	TEH	.560	ZBAHS	14	H	238
83	76	.38	84	PCT	15	P5	FB6	-.68		WAR					TEC	TEH	.560	ZBAHS	14	H	238
85	76	.84	103	PCT	30	P5	FB5	-.53		WAR					TEC	TEH	.560	ZBAHS	13	H	226
85	76	.26	270	PCT	13	P5	FB6	-.37		WAR					TEC	TEH	.560	ZBAHS	13	H	226
97	76	.27	116	PCT	11	P5	FB4	1.42		WAR					TEC	TEH	.560	ZBAHS	14	H	235
86	77	.31	262	PCT	15	P5	FB8	-.10		WAR					TEC	TEH	.560	ZBAHS	13	H	216
98	77	.50	98	PCT	21	P5	FB5	-1.48		WAR					TEC	TEH	.560	ZBAHS	13	H	219
102	77	.25	110	PCT	12	P5	FB3	1.47		WAR					TEC	TEH	.560	ZBAHS	13	H	220
102	77	.55	95	PCT	23	P5	FB4	-.94		WAR					TEC	TEH	.560	ZBAHS	13	H	220
102	77	.36	280	PCT	17	P5	FB5	-1.57		WAR					TEC	TEH	.560	ZBAHS	13	H	220
102	77	.41	109	PCT	19	P5	FB7	-1.39		WAR					TEC	TEH	.560	ZBAHS	13	H	220
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX
69	78	.21	240	PCT	9	P5	FB5	-.73		WAR					TEC	TEH	.560	ZBAHS	18	H	153
97	78	.33	112	PCT	16	P5	FB4	1.25		WAR					TEC	TEH	.560	ZBAHS	13	H	211
97	78	.30	257	PCT	15	P5	FB5	-1.01		WAR					TEC	TEH	.560	ZBAHS	13	H	211
97	78	.22	257	PCT	11	P5	FB5	1.25		WAR					TEC	TEH	.560	ZBAHS	13	H	211
97	78	.71	94	PCT	27	P5	FB6	-.96		WAR					TEC	TEH	.560	ZBAHS	13	H	211
99	78	.41	272	PCT	16	P5	FB4	1.33		WAR					TEC	TEH	.560	ZBAHS	14	H	219
101	78	.25	82	PCT	12	P5	FB4	-.93		WAR					TEC	TEH	.560	ZBAHS	13	H	210
101	78	.29	93	PCT	14	P5	FB4	1.34		WAR					TEC	TEH	.560	ZBAHS	13	H	210
101	78	.33	103	PCT	16	P5	FB5	-.85		WAR					TEC	TEH	.560	ZBAHS	13	H	210
101	78	.19	93	PCT	10	P5	FB6	-1.38		WAR					TEC	TEH	.560	ZBAHS	13	H	210
103	78	.41	98	PCT	15	P5	FB6	-1.23		WAR					TEC	TEH	.560	ZBAHS	14	H	218
69	80	.33	248	PCT	13	P5	FB5	-.09		WAR					TEC	TEH	.560	ZBAHS	18	H	139
79	80	.23	125	PCT	10	P5	FB4	.92		WAR					TEC	TEH	.560	ZBAHS	14	H	201
101	80	.20	74	PCT	10	P5	FB4	-1.20		WAR					TEC	TEH	.560	ZBAHS	13	H	189
80	81	.30	279	PCT	15	P5	FB4	-1.15		WAR					TEC	TEH	.560	ZBAHS	13	H	181
96	81	.20	96	PCT	10	P5	FB5	-1.53		WAR					TEC	TEH	.560	ZBAHS	13	H	182
100	81	.19	259	PCT	10	P5	FB5	1.64		WAR					TEC	TEH	.560	ZBAHS	13	H	183
102	83	.27	89	PCT	13	P5	FB5	-1.63		WAR					TEC	TEH	.560	ZBAHS	13	H	176
83	84	.34	93	PCT	13	P5	FB5	-.26		WAR					TEC	TEH	.560	ZBAHS	14	H	175
98	85	.24	264	PCT	12	P5	FB3	.85		WAR					TEC	TEH	.560	ZBAHS	13	H	162
98	85	.16	73	PCT	9	P5	FB4	-.87		WAR					TEC	TEH	.560	ZBAHS	13	H	162
98	85	.30	79	PCT	15	P5	FB4	1.73		WAR					TEC	TEH	.560	ZBAHS	13	H	162
98	85	.28	100	PCT	14	P5	FB5	-1.19		WAR					TEC	TEH	.560	ZBAHS	13	H	162
98	85	.27	84	PCT	13	P5	FB5	1.24		WAR					TEC	TEH	.560	ZBAHS	13	H	162
98	85	.20	90	PCT	10	P5	FB6	-1.66		WAR					TEC	TEH	.560	ZBAHS	13	H	162
63	86	.18	64	PCT	10	P5	FB4	-.80		WAR					TEC	TEH	.560	ZBAHS	17	H	92
79	86	.25	76	PCT	13	P5	FB5	-.60		WAR					TEC	TEH	.560	ZBAHS	13	H	152
79	86	.21	83	PCT	11	P5	FB6	-.33		WAR					TEC	TEH	.560	ZBAHS	13	H	152
97	86	.36	271	PCT	14	P5	FB5	-.98		WAR					TEC	TEH	.560	ZBAHS	14	H	155
97	86	.90	280	PCT	27	P5	FB6	-.73		WAR					TEC	TEH	.560	ZBAHS	14	H	155
101	86	.20	293	PCT	8	P5	FB5	-.77		WAR					TEC	TEH	.560	ZBAHS	14	H	154
101	86	.18	104	PCT	8	P5	FB6	-.82		WAR					TEC	TEH	.560	ZBAHS	14	H	154
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX
103	86	.26	263	PCT	13	P5	FB6	-1.02		WAR					TEC	TEH	.560	ZBAHS	13	H	146
105	86	.29	264	PCT	12	P5	FB5	-.69		WAR					TEC	TEH	.560	ZBAHS	14	H	153
113	86	.18	104	PCT	8	P5	FB5	-.73		WAR					TEC	TEH	.560	ZBAHS	14	H	151
74	87	.36	88	PCT	17	P5	FB4	-1.42		WAR					TEC	TEH	.560	ZBAHS	13	H	138
90	87	.34	281	PCT	16	P5	FB5	1.35		WAR					TEC	TEH	.560	ZBAHS	13	H	139
92	87	.31	88	PCT	12	P5	FB5	-1.20		WAR					TEC	TEH	.560	ZBAHS	14	H	146
96	87	.20	115	PCT	10	P5	FB4	1.66		WAR					TEC	TEH	.560	ZBAHS	13	H	140
96	87	.27	275	PCT	14	P5	FB5	1.71		WAR					TEC	TEH	.560	ZBAHS	13	H	140
96	87	.13	96	PCT	7	P5	FB6	-1.16		WAR					TEC	TEH	.560	ZBAHS	13	H	140
98	87	.25	94	PCT	10	P5	FB5	-1.34		WAR					TEC	TEH	.560	ZBAHS	14	H	147
98	87	.26	98	PCT	11	P5	FB6	-1.20		WAR					TEC	TEH	.560	ZBAHS	14	H	147
100	87	.33	89	PCT	16	P5	FB4	1.43		WAR					TEC	TEH	.560	ZBAHS	13	H	141
100	87	.18	86	PCT	9	P5	FB5	-1.49		WAR					TEC	TEH	.560	ZBAHS	13	H	141
102	87	.35	89	PCT	14	P5	FB5	-.82		WAR					TEC	TEH	.560	ZBAHS	14	H	148
63	88	.22	56	PCT	9	P5	FB4	-1.07		WAR					TEC	TEH	.560	ZBAHS	18	H	83
77	88	.22	75	PCT	11	P5	FB5	-.42		WAR					TEC	TEH	.560	ZBAHS	13	H	137
79	88	.18	111	PCT	8	P5	FB5	.02		WAR					TEC	TEH	.560	ZBAHS	14	H	145
105	88	.56	282	PCT	20	P5	FB5	-.61		WAR					TEC	TEH	.560	ZBAHS	14	H	143
84	103	.10	110	PCT	6	P5	05H	.49		WAR					TEC	TEH	.560	ZBAHS	13	H	43
92	115	.23	76	PCT	10	207	TSC	17.45				.19	.27		01C	TEC	.560	ZYAX2	1	C	214
93	116	.20	80	PCT	11	110	TSC	16.27				.17	.27		01C	TEC	.560	ZYAX2	2	C	250
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX
97	34	.32	70	PCT	11	30	TSC	.43				.17	.20		01C	TEC	.560	ZYAX2	1	C	269
99	34	1.72	87	PCT	26	207	TSC	.23				.23	.24		01C	TEC	.560	ZYAX2	2	C	299
109	54	.19	28	PCT	9	207	05H	34.46				.26	.20		06H	05H	.560	ZYAX2	36	H	12
72	59	.21	80	PCT	12	P5	FB5	.48		WAR					TEC	TEH	.560	ZBAHS	8	H	197
94	61	.21	68	PCT	12	P5	FB5	.57		WAR					TEC	TEH	.560	ZBAHS	8	H	211
94	61	.40	275	PCT	20	P5	FB6	1.07		WAR					TEC	TEH	.560	ZBAHS	8	H	211
114	61	.27	261	PCT	14	P5	FB4	-.49		WAR					TEC	TEH	.560	ZBAHS	8	H	212
89	62	.19	70	PCT	10	P5	FB5	.36		WAR					TEC	TEH	.560	ZBAHS	9	H	231
91	62	.27	256	PCT	15	P5	FB5	-.66		WAR					TEC	TEH	.560	ZBAHS	8	H	219
93	62	.45	89	PCT	20	P5	FB5	-.77		WAR					TEC	TEH	.560	ZBAHS	9	H	230
93	62	.08	52	PCT	5	P5	FB6	-.75		WAR					TEC	TEH	.560	ZBAHS	9	H	230
93	62	.21	74	PCT	11	P5	FB7	-.48		WAR					TEC	TEH	.560	ZBAHS	9	H	230
95	62	.19	260	PCT	11	P5	FB5	-.61		WAR					TEC	TEH	.560	ZBAHS	8	H	218
80	63	.26	89	PCT	14	P5	FB6	-1.35		WAR					TEC	TEH	.560	ZBAHS	8	H	225
95	64	.17	260	PCT	10	P5	FB5	1.67		WAR					TEC	TEH	.560	ZBAHS	8	H	233
97	64	.10	83	PCT	6	P5	FB5	-1.38		WAR					TEC	TEH	.560	ZBAHS	9	H	243
99	64	.18	274	PCT	11	P5	FB5	1.64		WAR					TEC	TEH	.560	ZBAHS	8	H	232
113	64	.15	68	PCT	9	P5	FB5	-1.52		WAR					TEC	TEH	.560	ZBAHS	8	H	229
100	65	.08	245	PCT	5	P5	FB4	1.48		WAR					TEC	TEH	.560	ZBAHS	8	H	240
110	65	.21	265	PCT	12	P5	FB3	-1.01		WAR					TEC	TEH	.560	ZBAHS	8	H	241
110	65	.19	87	PCT	11	P5	FB4	-1.00		WAR					TEC	TEH	.560	ZBAHS	8	H	241
110	65	.31	254	PCT	16	P5	FB5	-1.58		WAR					TEC	TEH	.560	ZBAHS	8	H	241
57	66	.49	95	PCT	22	P5	FB5	-1.19		WAR					TEC	TEH	.560	ZBAHS	10	H	95
71	66	.10	69	PCT	6	P5	FB5	1.81		WAR					TEC	TEH	.560	ZBAHS	9	H	264
77	66	.22	73	PCT	12	P5	FB5	1.14		WAR					TEC	TEH	.560	ZBAHS	8	H	253
79	66	.10	60	PCT	6	P5	FB5	.30		WAR					TEC	TEH	.560	ZBAHS	9	H	262
94	67	.20	85	PCT	11	P5	FB4	-.74		WAR					TEC	TEH	.560	ZBAHS	8	H	255
94	67	.17	252	PCT	10	P5	FB6	-1.27		WAR					TEC	TEH	.560	ZBAHS	8	H	255
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX
79	68	.21	67	PCT	11	P5	FB5	-.83		WAR					TEC	TEH	.560	ZBAHS	11	H	18
81	68	.21	88	PCT	11	P5	FB4	1.64		WAR					TEC	TEH	.560	ZBAHS	10	H	14
81	68	.28	103	PCT	14	P5	FB6	-.34		WAR					TEC	TEH	.560	ZBAHS	10	H	14
95	68	.23	80	PCT	12	P5	FB3	-.66		WAR					TEC	TEH	.560	ZBAHS	11	H	12
95	68	.37	100	PCT	17	P5	FB5	-.64		WAR					TEC	TEH	.560	ZBAHS	11	H	12
95	68	.35	96	PCT	17	P5	FB7	-.61		WAR					TEC	TEH	.560	ZBAHS	11	H	12
97	68	.73	103	PCT	28	P5	FB5	-.67		WAR					TEC	TEH	.560	ZBAHS	10	H	10
97	68	.18	288	PCT	10	P5	FB6	-.45		WAR					TEC	TEH	.560	ZBAHS	10	H	10
99	68	.19	99	PCT	10	P5	FB5	1.25		WAR					TEC	TEH	.560	ZBAHS	11	H	11
80	69	.12	109	PCT	7	P5	FB4	1.38		WAR					TEC	TEH	.560	ZBAHS	10	H	19
90	69	.30	106	PCT	15	P5	FB4	.78		WAR					TEC	TEH	.560	ZBAHS	10	H	20
92	69	.23	81	PCT	12	P5	FB4	.91		WAR					TEC	TEH	.560	ZBAHS	11	H	21
100	69	.37	104	PCT	18	P5	FB5	1.00		WAR					TEC	TEH	.560	ZBAHS	10	H	21
100	69	.50	100	PCT	22	P5	FB6	1.06		WAR					TEC	TEH	.560	ZBAHS	10	H	21
102	69	.18	91	PCT	10	P5	FB4	1.00		WAR					TEC	TEH	.560	ZBAHS	11	H	22
114	69	.14	54	PCT	8	P5	FB4	-1.09		WAR					TEC	TEH	.560	ZBAHS	10	H	22
114	69	.16	68	PCT	9	P5	FB4	1.59		WAR					TEC	TEH	.560	ZBAHS	10	H	22
114	69	.17	75	PCT	9	P5	FB5	.92		WAR					TEC	TEH	.560	ZBAHS	10	H	22
77	70	.19	292	PCT	10	P5	FB5	1.63		WAR					TEC	TEH	.560	ZBAHS	10	H	33
93	70	.47	94	PCT	21	P5	FB5	-1.16		WAR					TEC	TEH	.560	ZBAHS	10	H	29
93	70	.28	87	PCT	15	P5	FB6	-1.17		WAR					TEC	TEH	.560	ZBAHS	10	H	29
88	71	.18	297	PCT	10	P5	FB5	-.81		WAR					TEC	TEH	.560	ZBAHS	10	H	35
108	71	.25	91	PCT	13	P5	FB5	-.40		WAR					TEC	TEH	.560	ZBAHS	10	H	36
93	72	.15	279	PCT	9	P5	FB4	-.38		WAR					TEC	TEH	.560	ZBAHS	10	H	44
105	72	.17	84	PCT	10	P5	FB6	-.46		WAR					TEC	TEH	.560	ZBAHS	10	H	41
80	73	.25	110	PCT	14	P5	FB4	1.43		WAR					TEC	TEH	.560	ZBAHS	14	H	91
80	73	.43	93	PCT	21	P5	FB5	1.55		WAR					TEC	TEH	.560	ZBAHS	14	H	91
86	73	.30	105	PCT	16	P5	FB4	1.30		WAR					TEC	TEH	.560	ZBAHS	14	H	92
86	73	.48	100	PCT	22	P5	FB5	1.75		WAR					TEC	TEH	.560	ZBAHS	14	H	92
86	73	.37	98	PCT	19	P5	FB6	-1.30		WAR					TEC	TEH	.560	ZBAHS	14	H	92
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	UTIL1	UTIL2	CRLEN	CRWID	CEG	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX
88	73	.34	100	PCT	16	P5	FB5	.92		WAR					TEC	TEH	.560	ZBAHS	15	H	85
92	73	.32	106	PCT	17	P5	FB5	1.00		WAR					TEC	TEH	.560	ZBAHS	14	H	93
108	73	.17	98	PCT	10	P5	FB4	1.59		WAR					TEC	TEH	.560	ZBAHS	14	H	94
65	74	.21	68	PCT	11	P5	FB5	.97		WAR					TEC	TEH	.560	ZBAHS	20	H	166
67	74	.22	61	PCT	11	P5	FB5	1.32		WAR					TEC	TEH	.560	ZBAHS	21	H	151
69	74	.35	69	PCT	17	P5	FB5	.87		WAR					TEC	TEH	.560	ZBAHS	20	H	165
36	75	.20	280	PCT	11	P5	03H	-1.54		WAR					TEC	TEH	.560	ZBAHS	20	H	207
114	75	.16	94	PCT	9	P5	FB6	-.81		WAR					TEC	TEH	.560	ZBAHS	14	H	107
53	76	.71	89	PCT	28	P5	FB4	1.59		WAR					TEC	TEH	.560	ZBAHS	20	H	189
63	78	.13	221	PCT	7	P5	FB5	-1.16		WAR					TEC	TEH	.560	ZBAHS	21	H	182
77	78	.14	86	PCT	8	P5	FB5	1.98		WAR					TEC	TEH	.560	ZBAHS	14	H	133
52	79	.25	265	PCT	13	P5	FB5	-.77		WAR					TEC	TEH	.560	ZBAHS	20	H	209
101	80	.22	90	PCT	12	P5	FB6	-.98		WAR					TEC	TEH	.560	ZBAHS	14	H	141
85	84	.23	254	PCT	13	P5	FB5	-1.06		WAR					TEC	TEH	.560	ZBAHS	14	H	175
66	85	.19	108	PCT	12	P5	FB4	1.40		WAR					TEC	TEH	.560	ZBAHS	22	H	21
109	88	.11	69	PCT	6	P5	FB5	1.28		WAR					TEC	TEH	.560	ZBAHS	16	H	16
63	90	.42	107	PCT	13	207	04H	29.44				.30	.20		05H	04H	.560	ZYAX2	36	H	13
52	91	.18	263	PCT	10	P5	FB4	-1.00		WAR					TEC	TEH	.560	ZBAHS	20	H	163
62	95	.23	81	PCT	12	P5	FB4	-1.11		WAR					TEC	TEH	.560	ZBAHS	20	H	123

| ROW | COL | VOLTS | DEG | IND | PER | CHN | LOCN | INCH1 | INCH2 | UTIL1 | UTIL2 | CRLEN | CRWID | CEG | BEGT | ENDT | PDIA | PTYPE | CAL | L | IDX |