Entergy Operations, Inc.
1448 S.R. 333
Russellville, AR 72802
Tel 479-858-4710
Stephenie Pyle
Manager, Regulatory Assurance
Arkansas Nuclear One

1CAN041404

April 30, 2014

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Responses to RAIs Regarding 1R24 Steam Generator Tube Inspection Report
Arkansas Nuclear One, Unit 1
Docket No. 50-313
License No. DPR-51

REFERENCE:
1. Entergy letter dated October 23, 2013, "Steam Generator Tube Inspection Report – 1R24", (1CAN101306)(ML13296A746)
2. NRC letter dated April 1, 2014, "Request for Additional Information Regarding the Steam Generator Tube Inspection Report for Refueling Outage 1R24 (TAC NO. MF3251)(1CNA041401)(ML14078A112)

Dear Sir or Madam:

Entergy Operations, Inc. submitted the Arkansas Nuclear One, Unit 1 Steam Generator Tube Inspection Report for refueling outage 1R24 in accordance with Technical Specifications 5.5.9 "Steam Generator (SG) Program" via Reference 1. The NRC is currently reviewing this submittal and has determined that additional information is needed to complete its review. Reference 2 provides the request for the needed additional information. Attached are the responses to the requests.

There are no new commitments contained in this submittal.

Should you have any questions regarding this report, please contact me.

Sincerely,

Original signed by David B. Bice for Stephenie L. Pyle

SLP/rwc

Attachment Responses to RAIs Regarding 1R24 Steam Generator Tube Inspection Report

cc: Mr. Marc L. Dapas
Regional Administrator
U. S. Nuclear Regulatory Commission, Region IV
1600 East Lamar Boulevard
Arlington, TX 76011-4511

NRC Senior Resident Inspector
Arkansas Nuclear One
P.O. Box 310
London, AR 72847

U. S. Nuclear Regulatory Commission
Attn: Mr. Peter Bamford
MS O-8B3
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

ATTACHMENT TO

1CAN041404

Responses to RAIs Regarding 1R24 Steam Generator Tube Inspection Report

Responses to RAIs Regarding 1R24 Steam Generator Tube Inspection Report

By letter dated October 23, 2013 (ML 13296A746), Entergy Operations, Inc. (Entergy), submitted the Arkansas Nuclear One, Unit 1 (ANO-1) Steam Generator Tube Inspection Report for refueling outage 1R24 to ensure compliance with ANO-1 Technical Specification (TS) 5.5.9, "Steam Generator (SG) Program." The U.S. Nuclear Regulatory Commission (NRC) staff is currently reviewing the submittal and has determined that the additional information listed below is needed to complete its review:

1. **Section 3.7 indicates that there is tie rod bowing in the plastic range in the first-span tie rod region of both steam generators (SGs) and that as a result there will be some residual bowing during normal power operation. Please discuss what effects this residual bowing may have on normal operation of the SGs.**

   Based on the amount of plastic deformation that currently exist and projected to exist, tubes were plugged and stabilized to surround the affected tie rods. The gap between the tie rods and the adjacent tubes is ~ 0.25 inches. Therefore once the amount of plastic deformation exceeds that distance, there is a potential for the tie rod to come in contact with a tube and could potential result in mechanical wear. Therefore the affected tubes were removed from service by plugging and stabilizing.

2. **Section 3.7 indicates that the direction of tie rod bowing in the first span for SGs A and B are not consistent. For SG B, some of the bowing is circumferential as opposed to being all radially inward, as with SG A. Please discuss any insights on why there is a difference in the direction of bowing.**

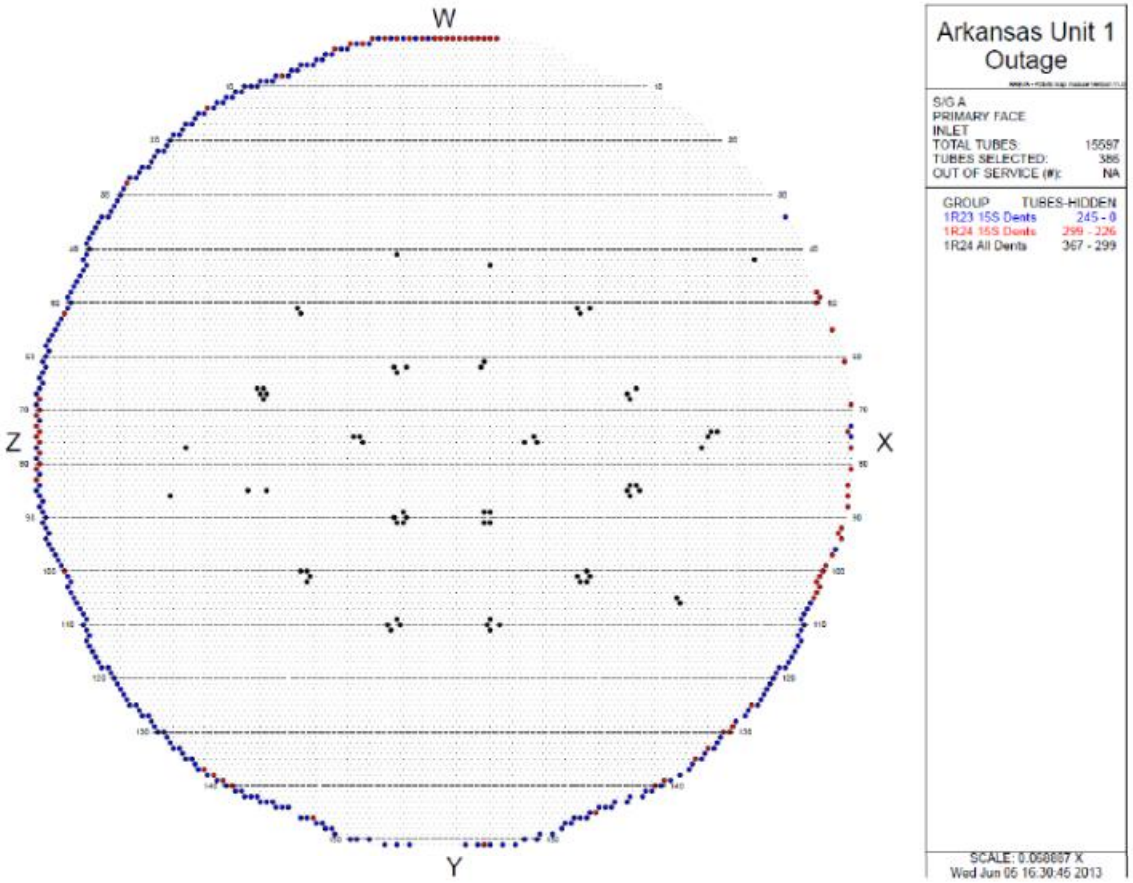
   The direction of the bowing is a direct result of where the tube support plates (TSPs) come in contact with the inner shroud as well as which plates and how many are affected by the inner shroud. As the component cools off, the frictional forces of the TSPs that come in contact with the inner shroud increase and cause a downward force on the tie rods. Based on where those contacts are cause the rods to bow in different directions. This has generally been consistent but can change slightly from outage to outage.

3. **As discussed in the telephone call on July 9, 2013 (ADAMS Accession No. ML 13172A029), peripheral tubes were inspected for signs of denting to assist in identifying locations where the tube support plates are suspected not to be freefloating. Please discuss the results of these inspections and your assessment of these results.**

   The top tube support plate (15S) showed a slight circumferential progression in the periphery along the W and or X axis as shown in the plot (red indications are the new dents (DNTs) in 1R24). The progression was not as significant as seen in prior outages.

   All voltages were below or near 1.0 Volts, and there was no noticeable difference in any repeat DNT voltage.

The circumferential extent of locking at the top TSP appears to be increasing with each operating cycle. The small dent analysis of the tubes in the 'drilled-only' holes of the top TSP are used to monitor this general progression of the overall mechanism associated with tie rod bowing. An increase in circumferential extent of locking may indicate that incremental load is being applied to the tie rods (with potential consequent increase in number of rods with bowing and/or increased magnitude of bowing). Of course, the as-inspected changes in tie rod bowing are the final measure of the progression of the postulated mechanism.



4. Figure 3.7.1 indicates that one tie rod in the first span may have been in contact with a tube during normal (hot) operating conditions. Please confirm that no tube wear was identified in the first span region of the tube that was in contact with the tie rod. The NRC staff notes that in 1 R24 (2013 outage), tube stabilization and plugging was performed in tubes that were predicted to be in contact with the tie rods during operation (hot conditions). Please explain if this is a change in practice since the prior inspection.

In the 180 day report on Figures 3.7.1 and 3.7.2, the red dots on the graphs indicate when that location was plugged and stabilized. Preventative plugging was started in the first in-service inspection in 1R20 for SGA and 1R23 for SGB. This practice has been performed

and was continued in the last outage (1R24) to plug out to the point that would allow for four additional thermal cycles to prevent contact. To date there has been no tube wear associated with tie rod bowing in either generator.

5. **Figure 3.7.1 indicates that the bow in 1 R23 had slightly less bow than was observed in 1R22. Please discuss any insights on condition.**

   When the component is returned to service (normal operating temperature and pressure), the TSPs are released from the inner shroud as it expands due to thermal expansion. During the next cool down, the TSPs may adhere to the shroud at different locations and times which results in more or less bowing.

6. **Please provide a listing of the location, orientation, and measured size of all service-induced wear indications detected during the 1 R24 (2013) outage and discuss any wear indications attributed to interaction between the tube and tube support plates.**

   This was not a code inspection so the list of TSP wear was only on those tubes near the tie rods that were part of the planned scope or that were contained in the previous tube to tube wear tubes. Therefore it was not included. Tables 1 and 2 lists the tubes for SGA and SGB, respectively, that were identified based on the limited scope inspection.

7. **The 95th percentile growth rate in SG A appears higher in 2013 (1 R24) than it was in 2011 (1 R23). In addition, the maximum growth rate observed was higher in SG B in 2013 than it was in 2011. Please discuss any insights on this condition since the growth rate for wear tends to decrease with time. In addition, please discuss how this condition was factored into your operational assessment (an increasing growth rate with time).**

   The 1R23 operational assessment was performed using a fully probabilistic model. Since this was a limited scope inspection, not all tubes were equally represented across the bundle. Once through designs, tend to have higher wear in the periphery than in the inner bundle. The maximum value (12.88%) was a periphery tube which was removed conservatively due to the higher growth rate. The value still fell within the distribution of the values used in the probabilistic model. Since the 1R23 data was based on a 100% inspection, one would expect it to be lower since it has all of the inner tubes in the population while this inspection focused on those around the tie rods and the periphery from the 9th TSP to the upper tube end.

8. **In Tables 3.7.5 and 3.7.6, depths are not provided in the X-probe column when two wear scars were detected by an array coil. Please clarify why the depth for each of the wear scars was not provided and discuss how the indications could have been sized with the array (X-) probe).**

   The reported depth was the total depth for the multiple wear scars based on the bobbin correlation. The indications do not reflect the locations with multiple wear scars at the same elevation since the depth sizing was based on the bobbin correlation. For the evaluations

for depth and growth, the multiple indications are conservatively treated as one indication with the total depth for both wear scars. X-probe data was taken on all tube-to-tube wear. This was not included in the original submittal. The following tables list those tubes with multiple indications and the depths by X-probe:

From Table 3.7.5 (SGA)

Row	Column	Location	Inch	Depth
43	22	8	18.94	7
43	22	8	18.49	6
50	23	8	17.18	5
50	23	8	17.75	4
75	109	8	17.89	8
75	109	8	18.14	5
77	25	8	18.81	6
77	25	8	19.20	6
77	109	8	17.12	9
77	109	8	18.97	6
81	111	8	18.33	9
81	110	8	18.52	9

From Table 3.7.6 (SGB)

Row	Column	Location	Inch	Depth
22	63	8	18.77	8
22	63	8	18.38	6
25	71	8	17.90	9
25	71	8	17.72	5
25	72	8	17.68	8
25	72	8	17.86	7
25	72	8	17.77	8
28	77	8	18.01	10
28	77	8	18.20	7
34	90	8	17.48	5
34	90	8	18.51	5
66	21	8	18.19	6
66	21	8	18.01	5
78	20	8	18.19	5
78	20	8	18.01	6
119	29	7	19.91	6
119	29	7	19.73	7

Table 1
SGA TSP Wear

#	Row	Col	Volts	% Throughwall	Support Location	Location
1	1	6	0.12	6	13S	0.51
2	1	16	0.13	7	10S	0.52
3	1	17	0.12	6	10S	0.55
4	1	19	0.16	8	10S	0.54
5	1	19	0.11	6	13S	-0.71
6	1	23	0.14	7	10S	0.52
7	2	4	0.18	9	13S	-0.64
8	9	31	0.27	11	12S	-0.74
9	10	1	0.25	12	13S	0.56
10	10	3	0.38	17	13S	0.53
11	11	1	0.43	19	13S	0.56
12	11	2	0.12	6	14S	-0.65
13	11	14	0.28	12	10S	-0.58
14	11	14	0.12	6	12S	-0.57
15	11	15	0.16	8	10S	-0.67
16	11	55	0.16	7	09S	0.42
17	12	1	0.16	8	13S	0.6
18	12	2	0.16	8	13S	0.58
19	12	15	0.2	9	10S	-0.62
20	12	15	0.11	5	10S	0.48
21	13	1	0.18	9	13S	0.53
22	13	17	0.21	10	09S	-0.59
23	13	17	0.28	13	10S	-0.67
24	13	57	0.17	7	09S	-0.65
25	14	19	0.26	12	10S	-0.67
26	14	77	0.21	11	13S	-0.81
27	15	80	0.38	17	13S	-0.79
28	19	87	0.24	12	13S	-0.76
29	20	89	0.25	13	12S	-0.79
30	21	90	0.52	23	12S	-0.83
31	22	92	0.23	12	12S	-0.79
32	22	92	0.32	16	13S	-0.81
33	23	85	0.43	17	10S	-0.76
34	23	86	0.73	26	10S	-0.83
35	23	94	0.32	16	12S	-0.83
36	24	38	0.15	7	08S	0.5

#	Row	Col	Volts	% Throughwall	Support Location	Location
37	24	83	0.46	18	10S	-0.8
38	24	83	0.25	11	12S	0.32
39	24	91	0.25	12	12S	-0.85
40	25	40	0.11	5	08S	0.45
41	25	59	0.25	10	08S	-0.67
42	26	99	0.13	7	12S	-0.76
43	27	102	0.14	7	10S	-0.79
44	31	79	0.1	4	08S	0.41
45	32	29	0.18	8	08S	-0.5
46	32	29	0.13	6	08S	0.52
47	33	29	0.18	8	08S	-0.62
48	33	30	0.13	6	08S	0.5
49	33	31	0.18	8	08S	-0.68
50	33	80	0.16	6	08S	-0.71
51	42	22	0.15	7	08S	-0.62
52	46	22	0.16	8	08S	0.5
53	46	23	0.31	13	08S	-0.62
54	46	23	0.12	6	08S	0.5
55	46	24	0.2	9	08S	-0.66
56	47	21	0.19	9	08S	-0.62
57	47	23	0.2	9	08S	-0.66
58	47	118	0.15	8	14S	0.28
59	48	22	0.17	8	08S	-0.64
60	51	1	0.16	8	13S	-0.55
61	64	22	0.2	9	08S	-0.62
62	65	21	0.36	15	08S	-0.62
63	65	23	0.2	9	08S	-0.59
64	65	110	0.2	8	07S	0.46
65	65	110	0.19	8	09S	-0.66
66	65	110	0.22	9	10S	0.3
67	66	21	0.14	7	08S	-0.53
68	66	22	0.28	12	08S	-0.64
69	66	23	0.18	8	08S	-0.62
70	66	24	0.2	9	08S	-0.62
71	67	22	0.24	11	08S	-0.62
72	67	23	0.29	13	08S	-0.57
73	67	24	0.29	13	08S	-0.57
74	67	25	0.19	9	08S	-0.62
75	70	1	0.14	7	11S	0.62

#	Row	Col	Volts	% Throughwall	Support Location	Location
76	71	1	0.16	8	11S	-0.46
77	71	110	0.22	10	08S	0.44
78	72	1	0.23	11	13S	-0.53
79	72	107	0.21	10	08S	-0.81
80	74	109	0.22	10	07S	0.48
81	74	109	0.24	11	08S	-0.72
82	74	109	0.16	7	08S	0.46
83	74	110	0.18	9	05S	-0.65
84	74	110	0.3	13	06S	-0.67
85	74	110	0.14	7	07S	0.46
86	74	110	0.19	9	08S	0.46
87	74	110	0.36	16	10S	-0.81
88	74	110	0.22	10	10S	0.28
89	75	108	0.4	17	06S	-0.67
90	75	108	0.2	9	08S	-0.65
91	75	108	0.29	13	09S	-0.76
92	75	109	0.45	19	06S	0.46
93	75	109	0.14	7	07S	0.44
94	75	109	0.17	8	08S	0.46
95	77	22	0.19	9	08S	0.5
96	77	109	0.35	15	08S	-0.69
97	77	109	0.28	12	08S	0.42
98	77	109	0.22	10	09S	-0.74
99	77	132	0.26	13	10S	-0.77
100	77	132	0.44	20	10S	0.34
101	78	131	0.14	7	10S	-0.75
102	81	1	0.1	5	13S	0.56
103	81	111	0.17	8	05S	-0.6
104	81	111	0.45	19	06S	-0.65
105	82	111	0.15	7	08S	0.49
106	84	22	0.4	17	08S	-0.57
107	84	22	0.16	8	08S	0.53
108	84	23	0.32	14	08S	-0.57
109	85	21	0.25	11	08S	-0.59
110	85	23	0.14	6	08S	0.53
111	86	22	0.17	8	08S	0.5
112	86	24	0.21	10	08S	-0.59
113	87	20	0.23	11	08S	-0.57
114	87	21	0.25	11	08S	-0.62

#	Row	Col	Volts	% Throughwall	Support Location	Location
115	93	1	0.13	7	13S	0.55
116	94	1	0.12	6	13S	0.55
117	100	1	0.12	6	13S	-0.51
118	101	1	0.17	9	13S	-0.55
119	104	23	0.2	9	08S	-0.59
120	104	25	0.19	9	08S	-0.66
121	106	23	0.24	11	08S	-0.64
122	106	23	0.17	8	08S	0.53
123	106	98	0.21	9	08S	-0.76
124	106	119	0.55	24	10S	-0.78
125	107	88	0.24	11	08S	0.48
126	119	30	0.28	12	08S	-0.66
127	119	30	0.12	4	09S	-0.61
128	119	44	0.28	13	07S	0.46
129	119	44	0.12	6	08S	-0.6
130	119	70	0.15	7	08S	0.48
131	120	78	0.13	5	08S	-0.68
132	120	78	0.25	11	08S	0.48
133	122	1	0.21	11	10S	0.53
134	125	1	0.14	8	13S	0.55
135	127	41	0.25	11	08S	0.46
136	127	88	0.15	6	09S	0.39
137	127	98	0.35	17	13S	-0.85
138	128	1	0.3	15	13S	0.48
139	128	83	0.29	12	09S	0.41
140	129	9	0.46	19	09S	0.48
141	129	10	0.12	4	14S	0.51
142	130	2	0.17	9	13S	0.53
143	131	1	0.12	7	14S	-0.48
144	133	1	0.11	6	13S	0.5
145	133	2	0.13	7	13S	0.53
146	133	2	0.15	8	14S	-0.55
147	134	1	0.31	15	14S	-0.62
148	135	1	0.18	9	13S	0.53
149	135	1	0.16	9	14S	-0.59
150	139	57	0.17	7	09S	-0.62
151	140	1	0.18	10	13S	-0.69
152	140	15	0.47	19	10S	-0.69
153	140	16	0.11	4	09S	-0.64

#	Row	Col	Volts	% Throughwall	Support Location	Location
154	140	16	0.38	16	09S	0.43
155	141	14	0.24	10	09S	0.46
156	141	15	0.26	11	09S	0.43
157	143	1	0.28	14	14S	-0.64
158	146	47	0.12	7	10S	-0.75
159	150	4	0.24	12	11S	-0.67
160	151	19	0.17	9	10S	-0.68
161	151	23	0.12	7	13S	0.28

Table 2
SGB TSP Wear

#	Row	Col	Volts	% Throughwall	Support Location	Location
1	1	1	0.27	12	11S	-0.71
2	1	4	0.81	28	11S	-0.69
3	1	8	0.63	23	11S	-0.82
4	1	10	0.32	14	11S	-0.85
5	1	14	0.54	21	11S	-0.78
6	1	15	0.29	13	11S	-0.73
7	1	16	0.93	30	11S	-0.78
8	1	17	0.43	17	11S	-0.75
9	1	18	0.51	20	11S	-0.73
10	1	19	0.28	12	11S	-0.71
11	1	20	0.58	22	11S	-0.78
12	1	24	0.32	14	11S	-0.75
13	2	1	0.26	11	11S	-0.69
14	2	2	0.24	11	10S	0.55
15	2	2	0.27	12	11S	0.53
16	2	2	0.09	5	14S	-0.81
17	2	3	0.09	4	10S	0.53
18	2	4	0.68	25	11S	-0.8
19	2	28	0.39	16	11S	-0.73
20	2	31	0.11	5	12S	-0.78
21	3	1	0.34	15	11S	-0.74
22	3	1	0.14	7	11S	0.46
23	3	2	0.14	7	10S	0.51
24	3	2	0.87	29	11S	-0.74
25	3	3	0.16	8	10S	0.55
26	3	3	0.36	15	11S	-0.74
27	3	34	0.17	8	10S	0.48
28	3	35	0.14	7	10S	0.57
29	4	1	0.11	5	10S	0.58
30	4	2	0.11	5	10S	0.53
31	5	41	0.39	16	11S	-0.69
32	5	41	0.25	11	11S	0.41
33	5	42	0.16	7	10S	0.6
34	6	3	0.1	5	10S	0.53
35	6	45	0.22	10	12S	0.39
36	6	46	0.29	13	11S	-0.69

#	Row	Col	Volts	% Throughwall	Support Location	Location
37	6	46	0.32	14	11S	0.5
38	6	47	0.29	12	10S	0.52
39	7	49	0.18	8	10S	0.53
40	7	49	0.31	13	11S	0.5
41	7	49	0.12	6	12S	0.41
42	7	50	0.19	9	10S	0.57
43	8	1	0.2	9	10S	0.55
44	8	1	0.29	13	11S	-0.67
45	8	52	0.31	13	11S	-0.66
46	8	53	0.16	7	10S	0.57
47	8	53	0.26	11	11S	-0.71
48	8	54	0.14	7	10S	0.62
49	8	54	0.27	12	12S	-0.78
50	9	1	0.17	8	10S	0.53
51	9	58	0.73	26	10S	0.66
52	9	59	0.17	8	10S	0.55
53	9	59	0.44	18	11S	-0.75
54	9	59	0.14	7	11S	0.46
55	9	60	0.35	15	10S	0.57
56	9	60	0.33	14	12S	-0.84
57	10	2	0.19	9	10S	0.53
58	10	64	0.27	12	11S	-0.66
59	10	65	0.22	10	10S	0.59
60	11	2	0.21	10	11S	-0.69
61	11	2	0.16	7	11S	0.51
62	11	14	1	32	10S	-0.57
63	12	1	0.16	7	10S	0.48
64	12	1	0.14	7	11S	-0.71
65	12	2	0.1	5	10S	0.41
66	12	2	0.23	10	11S	-0.71
67	12	69	0.18	8	10S	0.55
68	13	17	0.14	6	11S	-0.79
69	13	18	0.19	8	10S	-0.69
70	13	74	0.69	25	10S	-0.66
71	13	74	0.2	9	10S	0.46
72	14	76	0.39	16	11S	-0.71
73	14	77	0.15	7	10S	0.52
74	15	79	0.34	14	10S	0.64
75	15	79	0.6	22	11S	-0.75

#	Row	Col	Volts	% Throughwall	Support Location	Location
76	15	80	0.54	21	10S	-0.75
77	15	80	0.44	18	11S	-0.75
78	16	1	0.16	8	11S	-0.76
79	16	81	0.45	18	10S	0.52
80	16	81	0.33	14	11S	-0.75
81	17	1	0.37	16	11S	-0.78
82	17	84	0.29	13	10S	-0.7
83	17	84	0.4	16	11S	-0.75
84	18	1	0.54	21	11S	-0.78
85	18	78	0.41	16	10S	0.44
86	18	85	0.53	21	10S	-0.72
87	19	1	1	32	11S	-0.8
88	19	87	0.37	15	10S	0.5
89	20	50	0.1	4	07S	-0.6
90	20	51	0.14	6	07S	-0.68
91	20	51	0.3	13	08S	0.46
92	20	51	0.2	9	08S	-0.53
93	20	51	0.16	7	09S	-0.66
94	21	47	0.14	6	08S	0.55
95	22	62	0.14	5	08S	0.5
96	22	63	0.13	5	08S	0.48
97	22	93	0.21	10	10S	-0.66
98	22	93	0.26	11	11S	-0.71
99	23	8	0.91	30	10S	-0.74
100	23	38	0.11	4	08S	0.46
101	23	56	0.1	4	08S	0.51
102	23	59	0.19	8	08S	0.53
103	24	1	0.39	16	11S	-0.74
104	25	1	0.56	21	10S	-0.78
105	25	2	0.23	10	10S	-0.76
106	25	41	0.07	3	08S	-0.71
107	25	72	0.15	6	08S	0.5
108	26	39	0.22	9	06S	0.48
109	27	2	1.18	35	11S	-0.85
110	27	67	0.19	8	08S	0.53
111	27	68	0.09	4	08S	0.41
112	28	67	0.12	4	08S	0.53
113	28	68	0.11	4	08S	0.48
114	31	1	0.96	30	11S	-0.85

#	Row	Col	Volts	% Throughwall	Support Location	Location
115	31	33	0.15	6	10S	-0.69
116	31	33	0.39	16	08S	0.48
117	31	34	0.27	12	08S	0.48
118	31	78	0.23	10	08S	0.5
119	31	79	0.15	7	08S	0.5
120	32	1	0.6	22	11S	-0.78
121	32	77	0.17	7	08S	0.48
122	33	1	0.3	13	11S	-0.81
123	33	79	0.19	8	08S	0.52
124	34	1	0.33	14	11S	-0.78
125	34	90	0.14	5	08S	0.55
126	37	114	0.17	8	11S	-0.72
127	38	1	0.2	9	10S	0.46
128	38	115	0.17	8	10S	-0.59
129	44	1	0.16	7	10S	0.44
130	44	25	0.07	2	08S	0.53
131	44	117	0.32	14	11S	-0.73
132	46	119	0.26	11	11S	-0.59
133	46	119	0.28	12	13S	-0.71
134	48	1	0.3	13	11S	0.42
135	48	121	0.18	8	11S	0.57
136	48	121	0.37	15	13S	-0.68
137	48	121	0.34	14	12S	-0.66
138	49	1	0.26	11	11S	-0.74
139	49	122	0.33	14	13S	-0.66
140	51	120	0.18	8	10S	0.59
141	53	121	0.45	18	10S	0.58
142	53	124	0.1	5	10S	0.69
143	54	125	0.19	8	12S	0.48
144	56	127	0.19	9	12S	-0.64
145	58	129	0.17	8	12S	-0.5
146	61	130	0.14	6	10S	0.62
147	63	123	0.16	7	09S	-0.44
148	64	129	0.26	11	10S	0.59
149	65	110	0.18	8	10S	0.53
150	66	109	0.16	8	08S	0.55
151	67	130	0.16	7	12S	0.55
152	67	130	0.22	10	13S	0.5
153	67	130	0.16	7	13S	-0.62

#	Row	Col	Volts	% Throughwall	Support Location	Location
154	68	110	0.17	7	08S	0.6
155	68	131	0.15	7	10S	-0.48
156	68	131	0.18	8	10S	0.59
157	68	131	0.33	14	13S	0.48
158	70	131	0.16	7	09S	-0.46
159	71	1	0.16	7	12S	-0.81
160	71	132	0.21	9	10S	-0.57
161	72	131	0.13	6	09S	-0.48
162	72	131	0.25	11	10S	-0.64
163	72	131	0.23	10	11S	0.66
164	72	131	0.2	9	12S	0.59
165	73	132	0.71	25	10S	-0.66
166	73	132	0.15	7	12S	0.52
167	74	131	0.23	10	12S	0.57
168	75	132	0.16	6	12S	0.6
169	77	1	0.48	20	11S	-0.81
170	77	132	0.15	7	09S	-0.52
171	77	132	0.23	10	12S	0.52
172	79	1	0.42	17	12S	-0.76
173	80	1	0.3	13	11S	-0.88
174	81	132	0.14	6	09S	-0.55
175	82	131	0.11	5	12S	-0.57
176	86	20	0.11	5	08S	-0.78
177	86	20	0.11	5	08S	0.39
178	86	109	0.1	4	08S	0.58
179	88	122	0.23	11	09S	0.55
180	92	129	0.12	6	12S	-0.52
181	93	128	0.26	11	12S	-0.64
182	98	125	0.15	7	12S	-0.57
183	99	124	0.14	6	12S	0.59
184	99	124	0.19	8	13S	0.46
185	100	123	0.13	6	12S	0.57
186	101	120	0.26	11	12S	0.55
187	101	120	0.11	5	13S	0.53
188	104	99	0.13	6	10S	0.54
189	110	109	0.13	6	14S	0.6
190	113	1	0.35	13	12S	-0.71
191	114	115	0.1	5	13S	0.51
192	115	23	0.19	7	08S	-0.74

#	Row	Col	Volts	% Throughwall	Support Location	Location
193	116	113	0.49	19	10S	0.55
194	116	113	0.26	11	11S	0.55
195	117	1	0.57	21	12S	-0.74
196	117	112	0.32	13	10S	-0.61
197	117	112	0.11	5	11S	-0.53
198	117	112	0.27	12	11S	0.53
199	118	28	0.1	3	08S	0.46
200	118	111	0.21	9	10S	-0.55
201	118	111	0.18	8	11S	0.57
202	118	111	0.1	5	13S	-0.5
203	118	111	0.25	11	13S	0.58
204	119	79	0.2	9	08S	0.55
205	121	106	0.17	8	11S	0.6
206	122	1	0.34	13	12S	-0.71
207	122	105	0.27	12	10S	-0.64
208	122	105	0.65	23	11S	0.59
209	122	105	0.64	23	12S	-0.62
210	123	1	0.59	21	12S	-0.78
211	124	1	0.7	24	12S	-0.78
212	124	103	0.44	17	10S	-0.64
213	125	1	0.18	6	11S	-0.79
214	125	1	0.37	14	12S	-0.78
215	125	1	0.15	5	12S	0.39
216	125	101	0.3	13	12S	0.53
217	126	1	0.63	22	12S	-0.78
218	126	1	0.3	11	12S	0.35
219	126	99	0.18	8	11S	0.6
220	126	99	0.17	8	12S	0.55
221	127	1	0.54	20	12S	-0.78
222	127	97	0.29	12	11S	-0.6
223	127	97	0.39	16	12S	-0.6
224	127	98	0.43	17	11S	0.55
225	127	98	0.18	8	12S	-0.62
226	127	98	0.26	11	12S	0.51
227	128	1	0.38	14	12S	-0.76
228	128	60	0.19	7	08S	0.59
229	128	91	0.25	11	12S	-0.62
230	128	91	0.14	6	12S	0.55
231	129	1	0.57	21	12S	-0.76

#	Row	Col	Volts	% Throughwall	Support Location	Location
232	129	38	0.12	4	08S	0.55
233	129	83	0.15	7	09S	0.55
234	129	94	0.35	14	12S	0.53
235	130	1	0.22	8	12S	-0.78
236	130	92	0.17	8	10S	-0.61
237	130	92	0.26	11	12S	-0.6
238	130	93	0.27	12	11S	0.57
239	131	90	0.29	12	12S	-0.62
240	132	1	0.31	12	12S	-0.74
241	132	89	0.5	19	10S	-0.63
242	132	89	0.36	15	11S	0.58
243	132	89	0.15	7	12S	-0.51
244	133	87	0.21	9	11S	0.6
245	133	87	0.35	14	12S	-0.6
246	133	87	0.21	9	13S	0.53
247	133	88	0.16	7	11S	0.64
248	133	88	0.37	15	12S	-0.53
249	134	1	0.31	12	12S	-0.74
250	134	1	0.14	4	12S	0.46
251	134	85	0.24	10	10S	-0.55
252	134	85	0.42	17	12S	-0.57
253	134	85	0.11	5	13S	0.62
254	135	83	0.18	8	11S	-0.58
255	135	83	0.19	9	11S	0.57
256	135	83	0.31	13	12S	-0.55
257	135	83	0.21	9	13S	-0.55
258	135	83	0.32	13	13S	0.56
259	135	84	0.31	13	12S	-0.55
260	135	84	0.25	11	13S	-0.55
261	136	81	0.27	11	10S	-0.55
262	136	81	0.16	7	11S	-0.58
263	136	81	0.37	15	11S	0.57
264	136	81	0.39	16	12S	-0.6
265	136	81	0.24	10	13S	-0.55
266	136	81	0.35	15	13S	0.56
267	137	1	0.12	3	12S	0.32
268	137	79	0.21	9	11S	-0.62
269	137	79	0.58	22	13S	-0.6
270	137	80	0.12	6	11S	0.6

#	Row	Col	Volts	% Throughwall	Support Location	Location
271	138	76	0.36	15	13S	-0.53
272	138	76	0.17	8	12S	-0.58
273	138	77	0.13	6	11S	0.58
274	139	57	0.13	6	09S	-0.48
275	139	74	0.58	22	12S	-0.6
276	139	74	0.19	9	12S	0.53
277	140	55	0.19	9	11S	-0.67
278	140	55	0.3	13	13S	0.53
279	140	69	0.47	18	12S	-0.58
280	141	14	0.15	6	12S	0.39
281	141	54	0.1	5	11S	-0.48
282	141	55	0.21	10	11S	-0.62
283	141	68	0.24	10	12S	-0.55
284	141	68	0.23	10	13S	-0.6
285	142	64	0.14	6	11S	0.55
286	142	64	0.16	7	12S	-0.51
287	142	64	0.39	16	12S	0.6
288	142	65	0.16	7	10S	-0.52
289	142	65	0.15	7	11S	-0.58
290	142	65	0.17	8	13S	-0.48
291	144	52	0.2	9	13S	-0.53
292	144	52	0.14	6	13S	0.56
293	146	1	0.18	6	11S	-0.69
294	147	41	0.13	6	13S	0.55
295	147	42	0.17	8	11S	-0.64
296	147	42	0.24	11	14S	0.44
297	149	1	0.67	24	12S	-0.64
298	150	1	0.21	8	12S	-0.71
299	150	3	0.33	14	12S	-0.73
300	150	28	0.21	9	11S	-0.66
301	150	29	0.32	14	11S	-0.71
302	150	29	0.23	10	13S	-0.62
303	150	30	0.28	12	12S	-0.62
304	150	30	0.24	10	12S	0.46
305	151	1	0.39	16	12S	-0.71
306	151	1	0.21	9	10S	0.48
307	151	2	0.13	6	11S	-0.67
308	151	2	0.7	25	12S	-0.71
309	151	2	0.21	9	12S	0.46

#	Row	Col	Volts	% Throughwall	Support Location	Location
310	151	3	0.23	10	10S	0.48
311	151	3	0.53	20	12S	-0.71
312	151	3	0.2	9	13S	-0.69
313	151	4	0.84	28	10S	0.48
314	151	4	0.53	20	11S	0.46
315	151	4	0.16	7	12S	-0.69
316	151	5	0.45	18	10S	0.51
317	151	5	0.49	19	12S	-0.71
318	151	6	0.21	9	10S	0.53
319	151	6	0.36	15	12S	-0.71
320	151	7	0.1	5	12S	-0.71
321	151	7	0.17	7	13S	0.39
322	151	8	0.17	8	10S	0.51
323	151	8	0.23	10	11S	-0.69
324	151	8	0.44	17	12S	-0.73
325	151	9	0.35	14	10S	-0.63
326	151	9	0.25	11	13S	0.42
327	151	10	0.23	10	13S	-0.71
328	151	12	0.26	11	12S	-0.71
329	151	12	0.18	8	12S	0.41
330	151	12	0.12	6	13S	-0.67
331	151	15	0.26	11	11S	-0.71
332	151	15	0.18	8	11S	0.46
333	151	15	0.85	28	12S	-0.75
334	151	15	0.57	21	12S	0.41
335	151	15	0.38	15	13S	-0.67
336	151	15	0.37	15	13S	0.39
337	151	16	0.41	16	11S	-0.69
338	151	16	0.46	18	12S	-0.69
339	151	16	0.21	9	12S	0.46
340	151	16	0.34	14	13S	-0.71
341	151	16	0.31	13	13S	0.42
342	151	17	0.21	9	11S	-0.62
343	151	17	0.33	14	12S	-0.68
344	151	17	0.3	13	13S	-0.6
345	151	17	0.28	12	13S	0.37
346	151	18	0.18	8	11S	-0.62
347	151	18	0.22	10	12S	-0.66
348	151	18	0.47	18	13S	-0.71

#	Row	Col	Volts	% Throughwall	Support Location	Location
349	151	19	0.45	18	11S	-0.69
350	151	19	0.39	16	12S	-0.66
351	151	19	0.34	14	12S	0.46
352	151	19	0.32	13	13S	-0.69
353	151	20	0.24	10	12S	-0.59
354	151	20	0.24	10	13S	-0.67
355	151	21	0.46	18	12S	-0.62
356	151	24	0.16	7	12S	0.53