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2CAN021906

February 28, 2019

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Steam Generator Tube Inspection Report

Arkansas Nuclear One, Unit 2
Docket No. 50-368
Renewed Facility Operating License No. NPF-6

Dear Sir or Madam:

Entergy Operations, Inc. (Entergy) inspected the Arkansas Nuclear One, Unit 2 (ANO-2) Steam Generator (SG) tubes during the Fall 2018 refueling outage (2R26) in accordance with ANO-2 Technical Specification (TS) 6.5.9, "Steam Generator (SG) Program." ANO-2 TS 6.6.7, "Steam Generator Tube Inspection Report," requires that the results of inspections performed during the report period be submitted to the NRC within 180 days after the initial entry into Mode 4. The initial entry into Mode 4 post-2R26 occurred on November 13, 2018. The required inspection report is provided as an Enclosure to this letter.

The 2R26 inspection performed on both SGs involved an initial full-length bobbin coil examination of 100%.

This submittal completes the reporting requirements of the ANO-2 TSs for this inspection. This submittal contains no regulatory commitments.

Should you have any questions, please Contact Timothy L. Arnold, Manager, Regulatory Assurance at 479-858-7826.

Respectfully,

ORIGINAL SIGNED BY TIMOTHY L. ARNOLD

TLA/rwc

Enclosure: Arkansas Nuclear One, Unit 2 Steam Generator 180 Day Inspection Report

cc: Mr. Scott A. Morris
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U. S. Nuclear Regulatory Commission
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Enclosure

2CAN021906

**Arkansas Nuclear One, Unit 2 Steam Generator
180 Day Inspection Report**

(17 pages)

ARKANSAS NUCLEAR ONE, UNIT 2 STEAM GENERATOR 180 DAY INSPECTION REPORT

1 INTRODUCTION

Arkansas Nuclear One, Unit 2 (ANO-2) Technical Specification (TS) 6.6.7 states that a report shall be submitted within 180 days after the initial entry into HOT SHUTDOWN following completion of an inspection performed in accordance with TS 6.5.9, Steam Generator (SG) Program. The report shall include:

- a. The scope of inspections performed on each SG,
- b. Degradation mechanisms found,
- c. Nondestructive examination techniques utilized for each degradation mechanism,
- d. Location, orientation (if linear), and measured sizes (if available) of service induced indications,
- e. Number of tubes plugged during the inspection outage for each degradation mechanism,
- f. The number and percentage of tubes plugged to date, and the effective plugging percentage in each SG, and
- g. The results of condition monitoring, including the results of tube pulls and in-situ testing.

The operating period for this report includes one refueling outage inspection, 2R26, which started on September 29, 2018, and was the fifth In Service Inspection (ISI) following SG replacement. This report details the results of that inspection.

2 DESIGN

The ANO-2 Replacement Steam Generators (RSGs) are Westinghouse Model Delta 109 SGs with 10,637 thermally treated Alloy 690 U-tubes. The tubes have a nominal outside diameter of 0.688 inch and a nominal wall thickness of 0.040 inch. The tubes are hydraulically expanded through the tubesheet thickness, and are supported by eight, broached-hole tube support plates (TSPs). In the U-bend region, the tubes are supported by five sets of staggered Type 405 stainless steel anti-vibration bars (AVBs).

3 REPORT REQUIREMENTS

3.1 The scope of inspections performed on each SG

Table 3.1 lists the inspection scope of 2R26.

TABLE 3.1

SGA			
Examination Type	Number of Inspections	% Scope	Extent Tested
Bobbin	11079	100%	Full Length
Array Hot Leg (HL)	1455 + 20 tubes for deposit map	13.31%	various
Array Cold Leg (CL)	1372	12.38%	various
Special Interest Array/+Point	32	-	various
SGB			
Examination Type	Number of Inspections	% Scope	Extent Tested
Bobbin	11070	100%	Full Length
Array HL	1391 + 20 tubes for deposit map	12.75%	various
Array CL	1340	12.10%	various
Special Interest Array/+Point	30	-	various

3.2 Degradation mechanisms found

The primary tube degradation mechanism identified was wear at the AVB supports, with a total of two hundred thirty-six indications. Additionally, forty-three wear indications were identified at the TSP. Eleven loose part wear indications were identified, all of which were historical from prior inspections.

The total number of wear indications in each generator is listed in Table 3.2.

TABLE 3.2

SG	AVB Wear	TSP Wear	Loose Part Wear
A	124	17	8
B	112	26	3

3.3 Nondestructive examination techniques utilized for each degradation mechanism

TABLE 3.3

Degradation Mechanism(s)	Probe	EPRI ETSS	Demonstrated / Extended Applicability	Detection	Sizing Applicability
Bobbin Probe Techniques					
Support Wear	Bobbin	96041.1 (Rev. 5) App. I	AVBs/None	Yes	CMOA @ AVB
		96004.1 (Rev. 13)	AVBs, TSPs, and diagonal straps/None	Yes	CMOA @ TSP
Foreign Object Wear	Bobbin	27091.2 (Rev. 2)	PLP wear (Part not present) /PLP Wear (Part present) and volumetric indications	Yes	Not Recommended. Size with +Point™ or Array
Wear					
AVB Wear	+Point™	10908.4 (Rev. 1)	AVBs/Loose part wear with or without part present	Yes	CMOA @ AVB
	Array	17908.1 (Rev. 1) App. I 17908.4 (Rev. 1) App. I		Yes	
TSP Wear	+Point™	96910.1 (Rev. 11)	Broached TSPs/Loose part wear with or without part present	Yes	CMOA @ TSP
	Array	11956.3 (Rev 2) 11956.4 (Rev 2)		Yes	
Foreign Object Wear	+Point™	27901.1 (Rev. 1)	Circ groove, Note 1	Detection of Foreign Material based on material and proximity of foreign material to the tube based on EPRI reports 1020631 and 1018561. For sizing of PLP wear when part is present based on EPRI Report 1020631 on an as needed basis.	CMOA Freespan, expansion transitions and at structures (Part not present)
		27902.1 (Rev. 2)	Axial groove, Note 1		
		27903.1 (Rev. 1)	Tapered football, Note 1		
		27904.1 (Rev. 2)	Tapered round hole, Note 1		
		27905.1 (Rev. 2)	Flat wear, Note 1		
		27906.1 (Rev. 1)	Tapered wear, Note 1		
		27907.1 (Rev. 2)	45° tapered wear, Note 1		

TABLE 3.3 continued

Degradation Mechanism(s)	Probe	EPRI ETSS	Demonstrated / Extended Applicability	Detection	Sizing Applicability
Wear					
Foreign Object Wear	Array	17906.3 (Rev. 0) – Circ.	Circ groove, Note 3	Yes	CMOA Freespan, expansion transitions and at structures (Part not present)
		17902.1 (Rev. 0) – Ax.	Axial groove, Note 3		
		17903.1 (Rev. 0) – Ax.	Tapered football, Note 3		
		17904.1 (Rev. 0) – Ax.	Tapered round hole, Note 3		
		17905.1 (Rev. 0) – Ax.	Flat wear, Note 3		
		17906.1 (Rev. 0) – Ax.	Tapered wear, Note 3		
Pitting					
Pitting	+Point™	21998.1 (Rev. 4)	Volumetric in freespan / Sludge pile	Yes	CMOA
	Array	24998.1 (Rev. 1)		Yes	No – Size with +Point™
Diagnostic Techniques (Note 2)					
Various	Bobbin Array	Various	All Locations	N/A	
Notes:					
1. Demonstrated applicability for 2790x.1 series includes PLP wear (part not present) and extended applicability for 2790x.1 series includes PLP wear at TTS and TSP (part present).					
2. For the purposes of this document, diagnostic techniques are actually EPRI Appendix H and/or I qualified techniques that fall outside of the site validation process. The specific applications where diagnostic techniques will be utilized have been evaluated and determined to be consistent with industry practice. In addition, the data analysis instructions provided in the site Guidelines/ETSS provide the requisite assurance that unexpected degradation mechanisms will be detected and reported.					
3. Demonstrated applicability for 1790x.1 series includes PLP wear (part not present) and extended applicability for 1790x.1 series includes PLP wear at TTS and TSP (part present)					

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

Service induced indications included wear at the AVBs, TSPs, and due to loose parts. Due to the large number of indications, these are included in Attachment 1 and Attachment 2.

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

Nine tubes were plugged in SG A and three tubes were plugged in SG B during the 2R26 inspection. Details are listed in Table 3.5 below.

TABLE 3.5

SG	ROW	COL	Indication
A	132	73	PTP - 28% @A15
A	132	75	PTP – 33% @A11
A	133	82	PTP – 34% @A11
A	138	83	PTP – 39% @ A11
A	124	95	PTP – 34% @A15
A	142	115	PTP – PLP @TSH
A	141	116	PTP – PLP @TSH
A	143	116	PTP – PLP @TSH
A	142	117	PTP – PLP @TSH
B	142	83	PTP – 36% @A11
B	142	91	TBP – 42% @A15
B	6	99	PTP – PLP @TSC

3.6 The number and percentage of tubes plugged to date, and the effective plugging percentage in each SG

Tube plugging during 2R26 and prior outages is detailed below in Table 3.6.

TABLE 3.6

Year	Outage	SG A			SG B		
		Installed	Cumulative	% Plug	Installed	Cumulative	% Plug
2000	Fabrication	0	0	0.00	1	1	0.01
2000	Baseline	0	0	0.00	0	1	0.01
2002	2R15	0	0	0.00	0	1	0.01
2005	2R17	4	4	0.04	8	9	0.08
2009	2R20	1	5	0.05	4	13	0.12
2014	2R23	5	10	0.09	5	18	0.17
2018	2R26	9	19	0.18	3	21	0.20

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

All of the AVB, TSP, and foreign object wear indications were less than the condition monitoring limits and therefore met condition monitoring analytically. Additionally, the findings of the 2R26 SG examination were bounded by the behavior projected in the 2R23 operational assessment.

There were no tube pulls or in-situ testing performed during 2R26.

Attachment 1 Wear Indications – SG A						
FLAW	ROW	COL	TWD	LOCATION	ELEVATION	COMMENT
1	1	22	9	03C	0.43	TSP
2	2	1	17	02C	-0.07	TSP
3	3	28	9	A01	-0.12	AVB
4	4	181	19	03C	0	TSP
5	5	2	12	02C	0	TSP
6	5	2	16	03C	-0.07	TSP
7	43	148	17	A06	2.71	AVB
8	52	175	10	A06	-0.42	AVB
9	52	123	7	A07	0.62	AVB
10	52	39	9	A07	0.32	AVB
11	52	135	9	A07	0.47	AVB
12	52	143	12	A07	0.44	AVB
13	53	34	7	A07	0	AVB
14	57	174	9	A17	-0.08	AVB
15	59	60	12	A07	-0.19	AVB
16	60	171	12	A07	0.09	AVB
17	60	171	8	A13	-0.23	AVB
18	60	173	15	A16	-0.25	AVB
19	62	13	15	A05	0.2	AVB
20	63	46	10	A14	-0.11	AVB
21	63	10	11	A15	-0.18	AVB
22	64	61	7	A08	0.34	AVB
23	64	67	7	A13	-0.01	AVB
24	65	144	8	A13	-1.63	AVB
25	66	13	10	A05	0.28	AVB
26	70	61	7	A13	-0.21	AVB
27	74	15	8	A05	-0.08	AVB
28	74	167	8	A07	0.14	AVB
29	74	15	16	A18	0.11	AVB
30	77	68	8	A13	0.08	AVB

Attachment 1 Wear Indications – SG A						
FLAW	ROW	COL	TWD	LOCATION	ELEVATION	COMMENT
31	79	162	9	A15	0.28	AVB
32	80	73	7	A09	-0.23	AVB
33	80	117	8	A09	0.02	AVB
34	80	125	8	A09	0	AVB
35	80	115	9	A09	0.87	AVB
36	80	133	9	A09	0.37	AVB
37	80	121	14	A09	0.18	AVB
38	80	87	17	A09	0.98	AVB
39	80	89	8	A12	-0.81	AVB
40	81	62	8	A09	0.25	AVB
41	81	94	9	A09	0.35	AVB
42	83	18	14	A15	-0.2	AVB
43	83	18	7	A17	-0.02	AVB
44	84	111	7	A09	0	AVB
45	84	165	13	A15	0.15	AVB
46	87	108	18	A09	0.22	AVB
47	88	93	9	A09	0.26	AVB
48	89	110	7	A09	0.21	AVB
49	89	96	9	A09	0.03	AVB
50	89	162	13	A14	0.12	AVB
51	96	101	19	A10	0.35	AVB
52	99	82	9	A09	0.04	AVB
53	99	82	8	A16	0	AVB
54	102	91	11	A09	-0.02	AVB
55	103	94	12	A09	0.05	AVB
56	104	81	13	A17	-0.03	AVB
57	105	50	15	08C	0.43	TSP
58	105	152	10	A12	0.11	AVB
59	105	90	12	A14	0.05	AVB
60	106	27	12	03C	0.46	TSP

Attachment 1 Wear Indications – SG A						
FLAW	ROW	COL	TWD	LOCATION	ELEVATION	COMMENT
61	106	107	9	A12	0.18	AVB
62	109	90	17	A08	-0.01	AVB
63	109	90	15	A11	0.23	AVB
64	109	90	11	A16	-0.05	AVB
65	109	90	11	A20	-0.06	AVB
66	112	91	9	A07	0.02	AVB
67	112	91	9	A13	-0.06	AVB
68	114	81	7	A12	-0.08	AVB
69	117	100	13	A09	0.12	AVB
70	119	100	9	A08	-0.02	AVB
71	121	86	24	A09	0.02	AVB
72	121	138	19	A13	0	AVB
73	121	138	11	A16	0.05	AVB
74	123	46	9	A07	0.32	AVB
75	123	46	10	A13	-0.27	AVB
76	123	46	11	A15	-0.38	AVB
77	123	44	9	A17	-0.24	AVB
78	124	83	8	A07	0.6	AVB
79	124	91	10	A11	0.02	AVB
80	124	45	22	A13	0.2	AVB
81	124	47	22	A13	0.25	AVB
82	124	95	26	A13	0.67	AVB
83	124	47	16	A15	0.16	AVB
84	124	95	34	A15	0	AVB
85	124	95	11	A17	0	AVB
86	125	48	24	A13	-0.38	AVB
87	126	113	8	A09	0.08	AVB
88	127	78	9	A09	0	AVB
89	127	78	10	A15	0.45	AVB
90	128	75	18	A11	0.57	AVB

Attachment 1 Wear Indications – SG A						
FLAW	ROW	COL	TWD	LOCATION	ELEVATION	COMMENT
91	128	75	17	A15	0.33	AVB
92	132	123	11	07C	0.35	TSP
93	132	127	13	A07	0.07	AVB
94	132	73	11	A09	-0.71	AVB
95	132	75	33	A11	0.46	AVB
96	132	73	28	A15	0.23	AVB
97	133	48	12	08H	-0.44	TSP
98	133	82	8	A09	-0.84	AVB
99	133	82	34	A11	0.38	AVB
100	133	68	15	A13	0.34	AVB
101	133	96	21	A13	0.47	AVB
102	133	68	24	A15	0.37	AVB
103	134	51	13	06H	-0.61	TSP
104	134	87	12	A11	-0.57	AVB
105	134	87	21	A15	0.18	AVB
106	134	87	13	A17	0.12	AVB
107	135	102	18	A07	0.59	AVB
108	135	86	8	A09	-0.67	AVB
109	135	98	13	A09	0.52	AVB
110	135	122	13	A09	0	AVB
111	135	102	26	A09	0.98	AVB
112	135	88	13	A13	0.29	AVB
113	135	102	17	A13	0.49	AVB
114	135	102	23	A15	-0.33	AVB
115	135	102	16	A17	-0.2	AVB
116	136	109	11	A13	0.33	AVB
117	137	74	23	A11	0.39	AVB
118	138	125	12	08H	-0.54	TSP
119	138	55	17	08H	-0.42	TSP
120	138	119	12	A05	0.32	AVB

Attachment 1 Wear Indications – SG A						
FLAW	ROW	COL	TWD	LOCATION	ELEVATION	COMMENT
121	138	119	15	A09	-0.28	AVB
122	138	119	14	A11	0.44	AVB
123	138	83	39	A11	-0.49	AVB
124	138	123	15	A13	0.02	AVB
125	138	83	17	A13	-0.32	AVB
126	138	119	12	A15	-0.13	AVB
127	138	97	14	A15	0.34	AVB
128	138	119	10	A19	0.12	AVB
129	139	56	9	A07	0.23	AVB
130	139	114	10	A09	0.05	AVB
131	139	88	14	A09	-0.56	AVB
132	139	88	11	A11	-0.68	AVB
133	139	88	23	A13	-0.44	AVB
134	139	88	18	A15	-0.35	AVB
135	139	88	9	A19	0.06	AVB
136	141	118	10	A09	-0.25	AVB
137	142	61	9	06H	-0.7	TSP
138	142	61	15	08H	-0.41	TSP
139	142	111	26	TSH	27.22	PLP
140	142	119	12	TSH	30.92	PLP
141	142	119	6	TSH	30.26	PLP
142	143	112	11	04H	18.76	PLP
143	143	114	19	08C	0.27	TSP
144	144	119	13	TSH	28.48	PLP
145	146	113	13	TSH	26.83	PLP
146	146	115	11	TSH	26.61	PLP
147	146	115	7	TSH	25.88	PLP
148	148	71	12	03H	-0.52	TSP
149	150	105	13	06H	-0.66	TSP

Attachment 2 Wear Indications – SG B						
FLAW	ROW	COL	TWD	LOCATION	ELEVATION	COMMENT
1	1	174	10	05C	-0.48	TSP
2	3	84	9	05C	-0.5	TSP
3	4	81	17	05C	0	TSP
4	8	99	14	05C	-0.52	TSP
5	40	177	14	A16	-0.07	AVB
6	42	177	13	A16	-0.03	AVB
7	44	177	14	A16	0	AVB
8	50	41	11	A14	-0.48	AVB
9	52	109	6	A07	0	AVB
10	53	142	7	A07	0.17	AVB
11	55	174	9	A15	-0.34	AVB
12	59	170	7	A07	-0.27	AVB
13	61	164	13	A14	-0.03	AVB
14	64	103	6	A08	0	AVB
15	64	47	8	A08	0.71	AVB
16	69	170	10	A07	0	AVB
17	70	169	7	A05	0	AVB
18	70	169	13	A07	0	AVB
19	75	14	13	03C	-0.45	TSP
20	77	168	12	05C	0.41	TSP
21	77	168	7	06C	0.41	TSP
22	79	118	9	A09	-0.27	AVB
23	80	79	10	A09	0.24	AVB
24	80	95	16	A09	0.33	AVB
25	81	82	7	A14	0.05	AVB
26	82	69	7	A08	-0.17	AVB
27	83	128	7	A09	0.19	AVB
28	86	91	6	A17	-0.49	AVB
29	90	163	8	05C	-0.6	TSP
30	92	161	8	04C	-0.45	TSP

Attachment 2 Wear Indications – SG B						
FLAW	ROW	COL	TWD	LOCATION	ELEVATION	COMMENT
31	92	161	10	05C	0.39	TSP
32	94	161	9	04C	0.45	TSP
33	96	105	6	A10	0	AVB
34	97	158	11	04C	0.45	TSP
35	100	91	7	A07	0	AVB
36	100	25	23	TSC	12.67	PLP
37	105	86	11	A09	-0.37	AVB
38	109	102	7	A05	0.02	AVB
39	109	102	13	A13	0	AVB
40	109	102	26	A18	0.04	AVB
41	109	102	11	A19	0	AVB
42	110	133	8	A16	-0.09	AVB
43	111	108	10	A09	-0.12	AVB
44	111	92	16	A11	0.04	AVB
45	111	102	8	A13	0	AVB
46	111	96	23	A15	0	AVB
47	111	96	17	A16	0	AVB
48	111	96	10	A17	0	AVB
49	112	105	7	A07	0.02	AVB
50	112	149	10	A12	-0.19	AVB
51	112	149	7	A14	-0.21	AVB
52	112	149	17	A18	0.04	AVB
53	113	90	11	A07	0.21	AVB
54	113	92	8	A09	0	AVB
55	113	94	26	A13	0	AVB
56	113	92	15	A14	0	AVB
57	113	92	10	A17	0	AVB
58	115	104	13	A12	0.02	AVB
59	115	92	11	A13	0	AVB
60	115	104	11	A15	0.01	AVB

Attachment 2 Wear Indications – SG B						
FLAW	ROW	COL	TWD	LOCATION	ELEVATION	COMMENT
61	116	99	7	A06	0.02	AVB
62	116	99	20	A09	0.02	AVB
63	116	99	15	A12	-0.03	AVB
64	116	57	16	A16	-0.01	AVB
65	116	57	9	A18	0	AVB
66	117	70	8	A10	0	AVB
67	118	97	9	A12	0	AVB
68	120	63	12	A14	-0.01	AVB
69	120	63	11	A16	0	AVB
70	120	63	8	A18	0	AVB
71	122	91	19	A13	0.02	AVB
72	123	40	11	04C	0.43	TSP
73	124	99	7	A09	0.72	AVB
74	124	83	8	A09	0.07	AVB
75	125	46	9	A11	0.2	AVB
76	125	140	9	A11	-0.49	AVB
77	125	56	9	A13	0.43	AVB
78	125	46	13	A13	0.36	AVB
79	125	96	13	A13	0	AVB
80	125	82	14	A13	0.73	AVB
81	125	62	15	A15	0.29	AVB
82	125	96	20	A15	0	AVB
83	125	62	10	A19	0.11	AVB
84	126	85	12	A11	-0.93	AVB
85	128	93	13	A11	0	AVB
86	128	61	20	A11	0.61	AVB
87	128	93	9	A13	0	AVB
88	128	61	10	A15	-0.22	AVB
89	130	133	10	A17	-0.17	AVB
90	131	122	9	08C	0.34	TSP

Attachment 2 Wear Indications – SG B						
FLAW	ROW	COL	TWD	LOCATION	ELEVATION	COMMENT
91	131	54	8	A13	-0.31	AVB
92	132	83	7	A07	-0.41	AVB
93	132	57	9	A09	-0.25	AVB
94	132	57	23	A11	0.52	AVB
95	132	53	11	A13	0.02	AVB
96	132	57	15	A13	-0.4	AVB
97	133	94	15	A13	0.38	AVB
98	136	53	14	05C	0.47	TSP
99	136	115	14	A09	-0.32	AVB
100	136	115	12	A11	0.56	AVB
101	136	115	22	A13	0.38	AVB
102	136	115	23	A15	-0.18	AVB
103	137	92	10	A09	0	AVB
104	137	92	10	A11	0.58	AVB
105	137	92	17	A15	0.36	AVB
106	138	91	12	A11	0.05	AVB
107	138	105	24	A11	0.5	AVB
108	138	119	9	TSH	1.13	PLP
109	138	119	8	TSH	0.25	PLP
110	139	126	15	08H	-0.64	TSP
111	140	123	13	06H	-0.43	TSP
112	140	121	7	A09	-0.32	AVB
113	140	77	24	A09	-0.45	AVB
114	140	71	9	A11	0	AVB
115	140	99	12	A11	0.54	AVB
116	140	77	13	A11	-0.47	AVB
117	140	77	19	A11	0.51	AVB
118	140	77	20	A13	-0.29	AVB
119	140	71	8	A15	-0.21	AVB
120	140	99	9	A15	0.05	AVB

Attachment 2 Wear Indications – SG B						
FLAW	ROW	COL	TWD	LOCATION	ELEVATION	COMMENT
121	140	99	22	A17	0.15	AVB
122	141	60	15	04H	0.39	TSP
123	141	102	10	A09	0.33	AVB
124	142	83	12	A09	0.34	AVB
125	142	91	25	A11	0.02	AVB
126	142	83	36	A11	-0.48	AVB
127	142	83	16	A13	-0.36	AVB
128	142	91	34	A13	0.04	AVB
129	142	91	42	A15	0.07	AVB
130	142	91	20	A17	0.04	AVB
131	142	91	15	A19	0.02	AVB
132	143	62	18	05C	-0.54	TSP
133	143	94	10	A09	0.36	AVB
134	143	90	11	A11	-0.34	AVB
135	144	67	9	05C	0.45	TSP
136	144	67	12	05C	-0.58	TSP
137	144	63	15	05C	-0.54	TSP
138	146	113	11	05H	-0.58	TSP
139	148	109	8	04H	0.52	TSP
140	148	109	11	04H	-0.56	TSP
141	149	86	14	06H	0.37	TSP