

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION IV

Report No. 71-6698/79-01

Docket No. 71-6698

Licensees: Nuclear Assurance Corporation
24 Executive Park West
Atlanta, Georgia 30529

Nuclear Fuel Services, Inc.
Attn: Mr. Larry Wiedermann
Post Office Box 124
West Valley, New York 14171

Inspection at: Nuclear Fuel Services, West Valley, New York

Inspection
Conducted: April 19-20, 1979

Inspectors:

W. M. McNeill
W. M. McNeill, Contractor Inspector,
Vendor Inspection Branch

5/18/79
Date

Approved by:

D. E. Whitesell for
D. E. Whitesell, Chief, Components Section I,
Vendor Inspection Branch

5/18/79
Date

Summary

Special Inspection on April 19-20, 1979 (71-6698/79-01)

Areas Inspected: A special inspection of the spent fuel casks dimensional examination was performed as a result of the order to suspend the use of casks under Certificate of Compliance No. 6698. The inspection involved 12 inspector-hours on site by one NRC inspector.

Results: No items of noncompliance or deviations were identified.

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Details Section

A. Persons Contacted

1. Nuclear Assurance Corporation (NAC)
 - *R. C. Bonnett, Field Service Technician
 - *J. C. Dembo, Cask Design Engineer
 - H. R. Panter, Cask Design Engineer
 - *J. M. Viebrock, Manager On-site Operation

2. Nuclear Fuel Services (NFS)
 - W. A. Oldham, General Manager
 - *L. E. Seitter, QA Engineer
 - W. Wiedermann, Shipping and Storage Engineer

*denotes those present at the exit interview.

B. Dimensional Examination

1. Background Information

An order was issued on April 6, 1979, which prohibits the use of model numbers NFS-4 and NAC-1 spent fuel shipping casks. Seven (7) of these casks currently exist, one of which has not completed fabrication. The order required licensees to make actual physical measurements of existing packages (i.e. cask inner shell's bow or straightness and ovality or circularity) in order to demonstrate that the casks are in accordance with the Certificate of Compliance Number 6698. Certificate of Compliance Number 6698 references drawing E10080 which specifies straightness of 0.130 of an inch for the inner shell. The Certificate also references QA plans which reference ASME Code, Class 2, which specifies an ovality tolerance of 0.135 of an inch for the inner shell. NAC designed and procured a special cask cavity measuring tool. This tool consisted of four major parts, A center shaft, two (2) three-legged positioning spiders (top and bottom) and one traveling spider with six (6) dial indicators at 60° positions. The traveling spider is lowered in six (6) inch increments the full length of the cask. Readings were taken by one operator and checked by a second operator. The lower levels were read with the aid of binoculars. After all readings were taken, several random location readings were repeated. NAC documented this activity with a written procedure which also described the calibration of the tool. There were four (4) casks present, NFS-1A, NFS-1B, NAC-4C and NAC-4D. NAC-4E was measured at the fabricators shop, Excelco. NAC-4A and NAC-4B were at the Duke Power Oconee site.

2. Objectives

The objectives were to verify that the dimensional inspection performed by NAC gave assurance the spent fuel casks meet the certificates. The objectives also include verifying that the measurement system was accurate, valid and reliable.

3. Method of Accomplishment

The measurement process of all casks was observed by the inspector. This observation included:

- a. Verification that the gages and tools were calibrated,
- b. Checking the measurement tool after set up in the cask for excessive play and proper set up;
- c. Surveillance of the measurement activities for compliance to the documented procedure;
- d. Repeating random measurements during the measurement process; and
- e. Review of the data collected.

4. Findings

The gages and cask cavity measuring tool was found to have been calibrated currently. The set up was found to have very little play e.g. $\pm .00005$. The NAC personnel complied with the documented procedure. The measurements repeated by the inspector were in close agreement with NAC measurements. In general, the measurement system was observed to be very accurate e.g. $\pm .0004$. Some operator errors were observed. These errors were of random magnitude and were the result of reading dials through binoculars, background noise, and other various sources. The operator errors were not found at a significant frequency for the work environment. The raw data (See attached) indicated that some of the casks had a bow of about 0.170 to 0.180 of an inch, and others an ovality of about 0.170 to 0.180 of an inch. The raw data is to be reduced and fitted to "a line of best fit" and then submitted to NRC Transportation Branch for evaluation. NAC will have to perform an engineering evaluation of the bow and ovality conditions.

C. Exit Interview

The inspector met with licensee representatives (denoted in paragraph A) at the conclusion of the inspection on April 20, 1979. The inspector summarized the results of the inspection. The licensee representatives had no comment in response to each item discussed by the inspector.



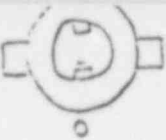
PCB Board
4.19.79

NFS-4A Cask Straightness & Ovality Measurements

Distance from Top of Cavity (microns)	A (150°)	B (90°)	C (30°)	D (330°)	E (270°)	F (210°)
4.5 1	.255	.285	.314	.238	.264	.271
6.5 2	.256	.304	.318	.250	.245	.251
12.5 3	.253	.302	.330	.255	.232	.236
18.5 4	.246	.306	.354	.263	.223	.227
24.5 5	.219	.308	.334	.273	.227	.131
30.5 6	.201	.322	.409	.302	.222	.153
36.5 7	.173	.323	.436	.320	.220	.138
42.5 8	.145	.325	.451	.349	.229	.119
48.5 9	.136	.339	.451	.359	.225	.128
54.5 10	.145	.342	.433	.352	.215	.106
60.5 11	.150	.313	.478	.355	.206	.100
✓ 66.5 12	.136	.332	.481	.355	.209	.102
72.5 13	.128	.331	.486	.311	.208	.125
78.5 14	.123	.325	.480	.360	.212	.108
84.5 15	.125	.325	.478	.360	.220	.112
90.5 16	.122	.339	.478	.352	.221	.112
96.5 17	.123	.308	.470	.360	.216	.123
✓ 102.5 18	.133	.316	.454	.349	.229	.132
103.5 19	.151	.338	.432	.318	.231	.133
114.5 20	.172	.340	.410	.296	.232	.147
120.5 21	.195	.352	.421	.285	.236	.158
126.5 22	.208	.336	.390	.279	.239	.168
132.5 23	.220	.325	.379	.274	.251	.184
✓ 138.5 24	.230	.315	.365	.264	.252	.193
144.5 25	.245	.298	.358	.256	.245	.224
150.5 26	.253	.285	.352	.252	.240	.230
156.5 27	.256	.265	.330	.255	.245	.262
162.5 28	.263	.255	.320	.248	.263	.276
168.5 29	.257	.271	.306	.242	.281	.289
174.5 30	.255	.282	.302	.241	.271	.233
Reproducibility				POOR ORIGINAL		
138.5 31	.229	.314	.366	.264	.253	.178
102.5 32	.134	.315	.455	.349	.229	.133
66.5 33	.135	.331	.437	.354	.208	.101
45 34	.254	.284	.313	.237	.263	.270

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(E) 270 90 (B)



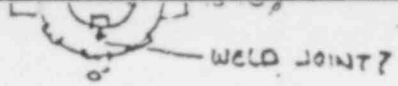
R C Bennett
Joseph C. Danko

MC-1C Cack Straightness & Ovality Measurements

Distance from Top of Part (inches)	A (150°)	B (90°)	C (30°)	D (330°)	E (270°)	F (210°)
4.5 →	.271	.317	.347	.288	.209	.242
6.5	.270	.320	.361	.300	.233	.243
12.5	.243	.304	.345	.293	.242	.249
18.5	.255	.284	.343	.280	.187	.235
24.5	.231	.279	.380	.275	.186	.212
30.5	.221	.272	.401	.291	.189	.185
36.5	.195	.253	.412	.328	.195	.170
42.5 →	.186	.251	.415	.317	.192	.167
48.5	.162	.250	.423	.318	.179	.159
54.5	.131	.255	.426	.362	.214	.126
60.5	.106	.255	.416	.380	.244	.122
66.5	.096	.244	.409	.395	.270	.115
72.5	.093	.232	.403	.402	.273	.115
78.5	.100	.212	.383	.416	.286	.112
84.5 →	.103	.200	.371	.429	.301	.090
90.5	.122	.193	.361	.439	.310	.090
96.5	.123	.183	.361	.439	.322	.075
102.5	.114	.189	.355	.429	.325	.067
108.5	.127	.194	.360	.426	.319	.063
114.5	.149	.211	.371	.443	.322	.071
120.5	.171	.199	.372	.433	.303	.085
126.5	.173	.192	.360	.420	.313	.092
132.5	.173	.183	.355	.383	.329	.110
138.5 →	.192	.185	.356	.382	.321	.113
144.5	.192	.190	.350	.372	.321	.128
150.5	.193	.195	.346	.360	.312	.132
156.5	.211	.209	.350	.340	.293	.128
162.5	.218	.216	.353	.339	.285	.123
168.5	.210	.228	.341	.319	.272	.126
174.5	.213	.230	.320	.330	.272	.122
Reproducibility						
138.5	.191	.183	.354	.376	.320	.116
84.5	.106	.201	.370	.473	.300	.091
42.5	.135	.250	.414	.316	.193	.163
4.5	.270	.318	.343	.289	.203	.241

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NAC-ID Cask Straightness & Ovality Measurements

Distance from Top of Cavity (inches)	A (150°)	B (90°)	C (30°)	D (230°)	E (270°)	F (210°)
4.5	.292	.304	.329	.267	.312	.324
6.5	.309	.325	.353	.291	.330	.352
12.5	.209	.281	.322	.193	.269	.300
18.5	.206	.280	.318	.222	.271	.272
24.5	.205	.270	.311	.252	.260	.261
30.5	.202	.260	.312	.272	.260	.245
36.5	.198	.256	.318	.298	.258	.240
42.5	.190	.250	.324	.305	.254	.234
48.5	.190	.251	.330	.311	.254	.232
54.5	.189	.252	.336	.312	.254	.232
60.5	.195	.249	.354	.312	.249	.192
66.5	.212	.240	.368	.319	.245	.191
72.5 →	.209	.235	.370	.320	.230	.182
78.5	.209	.238	.375	.315	.226	.181
84.5	.215	.240	.372	.310	.225	.176
90.5	.225	.246	.354	.302	.239	.159
96.5	.222	.253	.355*	.300	.222	.166*
102.5	.228	.262	.343	.295	.232	.151
103.5 →	.236	.269	.344	.289	.229	.154
114.5	.241	.268	.346	.282	.225	.150
120.5	.250	.265	.340	.285	.236	.159
126.5	.263	.258	.331	.290	.225	.170
132.5	.275	.248	.330	.292	.219	.190
138.5	.270	.244	.322	.290	.220	.203
144.5 →	.270	.245	.321	.280	.215	.219
150.5	.261	.251	.320	.280	.215	.225
156.5	.253	.260	.320	.265	.217	.240
162.5	.259	.269	.312	.250	.228	.232
168.5	.255	.271	.300	.280	.255	.230
174.5	.222	.265	.290	.290	.260	.239
Reproducibility						
144.5	.270	.246	.325	.280	.215	.220
108.5	.235	.269	.346	.291	.230	.154
72.5	.210	.236	.370	.322	.231	.181
4.5	.292	.303	.328	.266	.311	.324

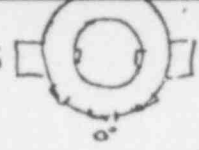
NEAR BRACKET WELD

NEAR BRACKET WELD

NEAR BRACKET WELD

POOR ORIGINAL

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Operator W. Hoch
J. H. H.

NFS-4B Cask Straightness & Ovality Measurements

Distance from Top of Cavity (inches)	A (150°)	B (90°)	C (30°)	D (230°)	E (270°)	F (210°)
4.5	.257	.280	.298	.221	.225	.288
6.5	.253	.281	.290	.223	.287	.286
12.5	.240	.274	.321	.207	.240	.278
18.5	.225	.265	.322	.225	.258	.269
24.5	.222	.268	.326	.256	.262	.260
30.5	.218	.250	.323	.268	.273	.258
36.5	.221	.248	.324	.229	.273	.253
42.5	.225	.241	.318	.283	.275	.256
48.5	.232	.223	.314	.280	.280	.260
54.5	.235	.219	.309	.272	.292	.267
60.5	.243	.218	.281	.261	.302	.270
66.5	.250	.202	.221	.251	.311	.310
72.5	.265	.185	.251	.245	.315	.340
78.5	.275	.175	.221	.236	.322	.275
84.5	.285	.180	.212	.221	.327	.282
90.5	.290	.180	.200	.199	.327	.304
96.5	.300	.181	.188	.173	.345	.319
102.5	.328	.183	.172	.145	.344	.332
108.5	.342	.208	.164	.129	.320	.342
114.5	.365	.208	.160	.119	.319	.340
120.5	.375	.212	.164	.127	.288	.334
126.5	.383	.216	.173	.140	.271	.329
132.5	.328	.211	.138	.150	.262	.320
138.5	.364	.215	.212	.160	.250	.311
144.5	.351	.220	.231	.170	.261	.290
150.5	.345	.236	.245	.172	.250	.268
156.5	.326	.252	.270	.180	.248	.240
162.5	.317	.268	.290	.196	.248	.211
168.5	.292	.304	.310	.220	.248	.280
174.5	.265	.286	.335	.259	.280	.272
Reproducibility	.236	.255	.293	.232	.254	.253
138.5	.352	.222	.232	.171	.240 ^F	.288
102.5	.344	.216	.172	.128	.308	.338
4.5	.252	.279	.298	.198	.272	.286

POOR ORIGINAL

428 198

bcc:
AD/RCI (Reinmuth)
IE Files
NMSS:FCMS
NMSS:FCSL
NRR:DPM:QAB
REG. I, II, III, & V
PDR HQS
CENTRAL FILES
WEVETTER, RIV

425 199