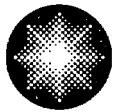


**George Vanderheyden**  
Vice President  
Calvert Cliffs Nuclear Power Plant  
Constellation Generation Group, LLC

1650 Calvert Cliffs Parkway  
Lusby, Maryland 20657  
410.495.4455  
410.495.3500 Fax



## Constellation Energy

June 18, 2004

U. S. Nuclear Regulatory Commission  
Washington, DC 20555

**ATTENTION:** Document Control Desk

**SUBJECT:** Calvert Cliffs Nuclear Power Plant  
Unit No. 1; Docket No. 50-317  
60 Days After Plant Restart Report - First Revised NRC Order EA-03-009,  
Interim Inspection Requirement for Reactor Pressure Vessel Heads at Pressurized  
Water Reactors

---

**REFERENCES:**

- (a) Letter from Mr. R. W. Borchardt (NRC) to Holders of Licenses for Operating Pressurized Water Reactors, dated February 20, 2004, Issuance of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors
- (b) Letter from Mr. C. F. Holden, Jr. (NRC) to Mr. G. Vanderheyden (CCNPP), dated May 4, 2004, Calvert Cliffs Nuclear Power Plant, Unit No. 1 – Relaxation of the Requirements of First Revised Order Modifying License (EA-03-009), Regarding Reactor Pressure Vessel Head Inspections (TAC No. MC1921)

The purpose of this letter is to forward Calvert Cliffs Nuclear Power Plant, Inc's "60 Days After Plant Restart" report requested in Section IV(E) of First Revised Nuclear Regulatory Commission Order EA-03-009 (Reference a). Calvert Cliffs Nuclear Power Plant completed the inspection of Unit 1 reactor vessel head penetrations required by Reference (a), as modified by Reference (b), and returned the plant to operation on May 9, 2004.

Attachment (1) to this letter provides the requested report. Should you have questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,

GV/GT/bjd

**Attachment:** (1) 60 Days After Plant Restart Report – First Revised NRC Order EA-03-009, Interim Inspection Requirement for Reactor Pressure Vessel Heads at Pressurized Water Reactors

A101

Document Control Desk

June 18, 2004

Page 2

cc: J. Petro, Esquire  
J. E. Silberg, Esquire  
Director, Project Directorate I-1, NRC  
G. S. Vissing, NRC

H. J. Miller, NRC  
Resident Inspector, NRC  
R. I. McLean, DNR

**ATTACHMENT (1)**

---

**60 DAYS AFTER PLANT RESTART REPORT  
FIRST REVISED NRC ORDER EA-03-009, INTERIM INSPECTION  
REQUIREMENT FOR REACTOR PRESSURE VESSEL HEADS AT  
PRESSURIZED WATER REACTORS**

---

## ATTACHMENT (1)

### 60 DAYS AFTER PLANT RESTART REPORT -- REVISED NRC ORDER EA-03-009, INTERIM INSPECTION REQUIREMENT FOR REACTOR PRESSURE VESSEL HEADS AT PRESSURIZED WATER REACTORS

---

Calvert Cliffs Nuclear Power Plant completed the inspection of Unit 1 reactor vessel head penetrations required by Nuclear Regulatory Commission (NRC) Order EA-03-009 (Reference 1), as modified by Reference (2), and returned the plant to operation on May 9, 2004.

Calvert Cliffs Unit 1 is in the highest susceptibility category as a result of having accumulated greater than 12 Effective Degradation Years, which was calculated in accordance with the methodology provided in the Order. For those plants in the High category, reactor pressure vessel (RPV) head and head penetration nozzle inspections must be performed using the following techniques every refueling outage;

- (a) Bare metal visual examination of 100% of the RPV head surface (including 360° around each RPV head penetration nozzle). For RPV heads with the surface obscured by support structure interferences which are located at RPV head elevations downslope from the outermost RPV head penetration, a bare metal visual inspection of no less than 95 percent of the RPV head surface may be performed provided that the examination shall include those areas of the RPV head upslope and downslope from the support structure interference to identify any evidence of boron or corrosive product. Should any evidence of boron or corrosive product be identified, the licensee shall examine the RPV head surface under the support structure to ensure that the RPV head is not degraded.
- (b) For each penetration, perform a nonvisual NDE [nondestructive examination] in accordance with either (i), (ii), or (iii):
  - (i) Ultrasonic testing of the RPV head penetration nozzle volume (i.e., nozzle base material) from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 2 inches below the lowest point at the toe of the J-groove weld on a horizontal plane perpendicular to the nozzle axis (or bottom of the nozzle if less than 2 inches); OR from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 1.0-inch below the lowest point at the toe of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and including all RPV head penetration nozzle surfaces below the J-groove weld that have an operating stress level (including all residual and normal operation stresses) of 20 ksi tension and greater. In addition, an assessment shall be made to determine if leakage has occurred into the annulus between the RPV head penetration nozzle and the RPV head low-alloy steel.
  - (ii) Eddy current testing or dye penetrant testing of the entire wetted surface of the J-groove weld and the wetted surface of the RPV head penetration nozzle base material from at least 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 2 inches below the lowest point at the toe of the J-groove weld on a horizontal plane perpendicular to the nozzle axis (or the bottom of the nozzle if less than 2 inches); OR from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 1.0-inch below the lowest point at the toe of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and including all RPV head penetration nozzle surfaces below the J-groove weld that have an operating stress level (including all residual and normal operation stresses) of 20 ksi tension and greater.
  - (iii) A combination of (i) and (ii) to cover equivalent volumes, surfaces, and leak paths of the RPV head penetration nozzle base material and J-groove weld as described in (i) and (ii). Substitution of a portion of a volumetric exam on a nozzle with a surface examination may be performed with the following requirements:

## ATTACHMENT (1)

### 60 DAYS AFTER PLANT RESTART REPORT -- REVISED NRC ORDER EA-03-009, INTERIM INSPECTION REQUIREMENT FOR REACTOR PRESSURE VESSEL HEADS AT PRESSURIZED WATER REACTORS

---

1. On nozzle material below the J-groove weld, both the outside diameter and inside diameter surfaces of the nozzle must be examined.
2. On nozzle material above the J-groove weld, surface examination of the inside diameter surface of the nozzle is permitted provided a surface examination of the J-groove weld is also performed.

#### CCNPP Inspection Results

The bare metal visual examination was accomplished with no indications of leakage. Every penetration was examined 360° around. The head was clean, with no evidence of degradation of any kind.

The vent line and in-core instrument (ICI) penetrations were examined using a rotating ultrasonic testing (UT) probe. These examinations included all of the nozzle material from the bottom of the nozzle to greater than 2 inches above the J-groove weld. There were no indications of cracking or degradation.

For the ICI penetrations, an assessment to determine if leakage has occurred into the interference fit zone was performed using an ultrasonic technique. There was no evidence of leakage.

For the vent line, a UT leakage path assessment could not be performed because the vent line was installed with a clearance fit. For the vent line the assessment to determine whether leakage has occurred into the interference fit zone was accomplished by performing an eddy current examination (ET) of the J-groove weld surface. No evidence of leakage was found.

All of the control element drive mechanism penetrations were inspected using UT techniques. The assessment to determine if leakage has occurred into the interference fit zone was performed using an ultrasonic technique. All nozzles were examined from the bottom of the nozzle to a minimum of 1.67 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis). The majority of the nozzles were inspected to a distance  $\geq 2$  inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) 360° around. No indications of degradation, cracking, or leakage were identified. Results of the RPV head penetration examinations are provided in Table 1.

Calvert Cliffs requested and was granted relaxation from the requirements to examine the nozzle from the bottom of the nozzle to 2 inches above the J-groove weld (Reference 2). The relaxation provided the alternative scope of inspecting the nozzles from the bottom of the nozzle to a minimum of 1.67 inches above the J-groove weld.

#### REFERENCES:

- (1) Letter from Mr. R. W. Borchardt (NRC) to Holders of Licenses for Operating Pressurized Water Reactors, dated February 20, 2004, Issuance of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors
- (2) Letter from Mr. C. F. Holden, Jr. (NRC) to Mr. G. Vanderheyden (CCNPP), dated May 4, 2004, Calvert Cliffs Nuclear Power Plant, Unit No. 1 – Relaxation of the Requirements of First Revised Order Modifying License (EA-03-009), Regarding Reactor Pressure Vessel Head Inspections (TAC No. MC1921)

**ATTACHMENT (1)**

**60 DAYS AFTER PLANT RESTART REPORT -- REVISED NRC ORDER EA-03-009,  
INTERIM INSPECTION REQUIREMENT FOR REACTOR PRESSURE VESSEL HEADS  
AT PRESSURIZED WATER REACTORS**

**TABLE 1**

**RESULTS OF THE RPV HEAD PENETRATION EXAMINATIONS FOR CCNPP UNIT 1  
(Page 1 of 3)**

Extent of UT Coverage in Reactor Vessel Head Penetration Nozzle Material Flaws				
Pen #	Min Distance Above Up-Hill Weld Root	Circumferential Coverage Achieved (Degrees)	Leak Path Assessment Determination Possible?	Flaws/Leak Path Detected (Yes/No)
1	> 2.0	360	Yes	No
2	> 2.0	360	Yes	No
3	> 2.0	360	Yes	No
4	> 2.0	360	Yes	No
5	> 2.0	360	Yes	No
6	2.0	360	Yes	No
7	> 2.0	360	Yes	No
8	> 2.0	360	Yes	No
9	> 2.0	360	Yes	No
10	> 2.0	360	Yes	No
11	> 2.0	360	Yes	No
12	> 2.0	360	Yes	No
13	> 2.0	360	Yes	No
14	> 2.0	360	Yes	No
15	> 2.0	360	Yes	No
16	> 2.0	360	Yes	No
17	> 2.0	360	Yes	No
18	> 2.0	360	Yes	No
19	> 2.0	360	Yes	No
20	> 2.0	360	Yes	No
21	> 2.0	360	Yes	No
22	> 2.0	360	Yes	No
23	> 2.0	360	Yes	No
24	> 2.0	360	Yes	No
25	> 2.0	360	Yes	No
26	> 2.0	360	Yes	No
27	> 2.0	360	Yes	No
28	> 2.0	360	Yes	No
29	> 2.0	360	Yes	No
30	> 2.0	360	Yes	No
31	> 2.0	360	Yes	No
32	> 2.0	360	Yes	No
33	> 2.0	360	Yes	No
34	> 2.0	360	Yes	No
35	1.88*	360	Yes	No
36	1.96*	360	Yes	No

**ATTACHMENT (1)**

**60 DAYS AFTER PLANT RESTART REPORT -- REVISED NRC ORDER EA-03-009,  
INTERIM INSPECTION REQUIREMENT FOR REACTOR PRESSURE VESSEL HEADS  
AT PRESSURIZED WATER REACTORS**

**TABLE 1  
RESULTS OF THE RPV HEAD PENETRATION EXAMINATIONS FOR CCNPP UNIT 1  
(Page 2 of 3)**

<b>Extent of UT Coverage in Reactor Vessel Head Penetration Nozzle Material Flaws</b>				
<b>Pen #</b>	<b>Min Distance Above Up-Hill Weld Root</b>	<b>Circumferential Coverage Achieved (Degrees)</b>	<b>Leak Path Assessment Determination Possible?</b>	<b>Flaws/Leak Path Detected (Yes/No)</b>
37	1.97*	360	Yes	No
38	> 2.0	360	Yes	No
39	> 2.0	360	Yes	No
40	> 2.0	360	Yes	No
41	> 2.0	360	Yes	No
42	> 2.0	360	Yes	No
43	1.90*	360	Yes	No
44	> 2.0	360	Yes	No
45	1.95*	360	Yes	No
46	1.86*	360	Yes	No
47	1.96*	360	Yes	No
48	> 2.0	360	Yes	No
49	1.96*	360	Yes	No
50	1.95*	360	Yes	No
51	> 2.0	360	Yes	No
52	1.95*	360	Yes	No
53	1.74*	360	Yes	No
54	2.00	360	Yes	No
55	1.70*	360	Yes	No
56	1.86*	360	Yes	No
57	> 2.0	360	Yes	No
58	2.00	360	Yes	No
59	1.86*	360	Yes	No
60	1.67*	360	Yes	No
61	1.85*	360	Yes	No
62	> 2.0	360	Yes	No
63	> 2.0	360	Yes	No
64	> 2.0	360	Yes	No
65	1.91*	360	Yes	No
ICI1	> 2	360	Yes	No
ICI2	> 2	360	Yes	No
ICI3	> 2	360	Yes	No
ICI4	> 2	360	Yes	No
ICI5	> 2	360	Yes	No
ICI6	> 2	360	Yes	No
ICI7	> 2	360	Yes	No

ATTACHMENT (1)

60 DAYS AFTER PLANT RESTART REPORT -- REVISED NRC ORDER EA-03-009,  
INTERIM INSPECTION REQUIREMENT FOR REACTOR PRESSURE VESSEL HEADS  
AT PRESSURIZED WATER REACTORS

---

TABLE 1

RESULTS OF THE RPV HEAD PENETRATION EXAMINATIONS FOR CCNPP UNIT 1  
(Page 3 of 3)

Extent of UT Coverage in Reactor Vessel Head Penetration Nozzle Material Flaws				
Pen #	Min Distance Above Weld Root	Circumferential Coverage Achieved (Degrees)	Leak Path Assessment Determination Possible?	Flaws/Leak Path Detected (Yes/No)
ICI8	> 2	360	Yes	No
Vent line	> 2	360	Yes**	No

\* Relaxation from the Order requirement to inspect two inches above the J-groove weld was granted.

\*\* Leak path assessment performed by ET of weld.