



**Kenneth F. Robinson**  
Manager-Engineering Services

Calvert Cliffs Nuclear Power Plant  
1650 Calvert Cliffs Parkway  
Lusby, MD 20657

410 495 5208 Office  
443 532 5709 Mobile  
www.exeloncorp.com

ken.robinson@exelon.com

April 28, 2014

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

Calvert Cliffs Nuclear Power Plant  
Unit No. 1; Docket No. 50-317  
Renewed Facility Operating License No. DPR-53

Subject: Long Term Coupon Surveillance Program

Reference: 1. Letter from D. V. Pickett (NRC) to J. A. Spina (CCNPP), dated August 27, 2008, Amendment re: Long-Term Coupon Surveillance Program

This letter is submitted as required by Reference 1, the results of the coupon surveillance program are provided in Attachment (1).

There are no regulatory commitments contained in this letter.

Should you have questions regarding this matter, please contact Mr. Douglas E. Lauver at (410) 495-5219.

Respectfully,

A handwritten signature in black ink, appearing to read "Kenneth F. Robinson".

Kenneth F. Robinson  
Manager-Engineering Services

KFR/PSF/bjd

Attachment: (1) Long Term Coupon Surveillance Program Results

cc: NRC Project Manager, Calvert Cliffs  
NRC Regional Administrator, Region I

NRC Resident Inspector, Calvert Cliffs  
S. Gray, MD-DNR

A001  
NRR

**ATTACHMENT (1)**

---

**LONG TERM COUPON SURVEILLANCE PROGRAM RESULTS**

---

## ATTACHMENT (1)

### Long Term Coupon Surveillance Program Results

---

Performance of Engineering Test Procedure 86-003R "Analysis of Neutron Absorbing Material in the Spent Fuel Storage Racks and Management of the Neutron Poison Sample Coupon Trees" was completed on December 5, 2013. The initial results of coupon dimension and weight measurements did not meet the acceptance criteria listed in the long term coupon surveillance program (approved by Reference 1) The specific criteria is, "Any change in weight of  $\pm 26$ -percent compared to baseline".

Weight loss values for the coupons in packet 18 are as follows:

- Coupon 2U from packet 18 has an indicated 30% weight loss. This exceeds the acceptance criteria of 26%.
- Coupons 1U and 2L from packet 18 indicate 20% and 21% weight loss respectively which exceeds the projected weight loss curve to maintain less than 26% weight loss by end of life. Note: the end of life for the Spent Fuel Pool is 60 years plant operation + 10 years = 2046.
- Coupon 1L from packet 18 indicates 11% weight loss which does not exceed the acceptance criteria of 26%.

A recovery plan was initiated which performed the following actions:

1. Expand the scope of testing in accordance with the long term coupon surveillance program
2. Perform areal density testing on original and expanded scope coupons and compare to the acceptance criteria of 26%
3. Determine the cause of the weight loss

#### Expanded Scope

The expanded surveillance scope to remove additional coupons was performed on December 20, 2013. Two of four coupons (1U and 1L) were removed from packet 24. This packet was originally scheduled for testing in 2021. This packet was selected because it has not been previously measured and is expected to have reached a higher integrated gamma dose than the coupons on the coupon tree currently being tested. Final measurements were performed on January 7, 2014 and the indicated weight loss was 15.8% (24-1U) and 10.4% (24-1L), which is well within the acceptance criteria.

Areal density testing was performed on all 6 of the examined coupons by NETCO at the Pennsylvania State General Atomics TRIGA Mark 3 Nuclear Reactor. The results below show that the measured areal density of the coupons fall within the acceptance criteria of the sum of upper and lower areal densities for each pair are  $> 0.0177 \text{ g-B}^{10}/\text{cm}^2$

Coupon 18-1L minimum areal density       $0.0128 \text{ g-B}^{10}/\text{cm}^2$

Coupon 18-1U minimum areal density       $0.0124 \text{ g-B}^{10}/\text{cm}^2$

$$18-1L + 18-1U = 0.0252 \text{ g-B}^{10}/\text{cm}^2$$

Coupon 18-2L minimum areal density       $0.0126 \text{ g-B}^{10}/\text{cm}^2$

Coupon 18-2U minimum areal density       $0.0124 \text{ g-B}^{10}/\text{cm}^2$

$$18-2L + 18-2U = 0.0250 \text{ g-B}^{10}/\text{cm}^2$$

## ATTACHMENT (1)

### Long Term Coupon Surveillance Program Results

---

Coupon 24-1L minimum areal density      0.0127 g-B<sup>10</sup>/cm<sup>2</sup>

Coupon 24-1U minimum areal density      0.0135 g-B<sup>10</sup>/cm<sup>2</sup>

$$18-1L + 18-1U = 0.0262 \text{ g-B}^{10}/\text{cm}^2$$

Evaluation of carborundum coupons revealed that the majority of the coupon weight loss was due to flow induced erosion caused by an inspection hole in the coupon bracket cover. The neutron absorbing material in the spent fuel rack is not susceptible to this erosion because there are no inspection holes in the active fuel region. Note that the criticality analysis of record does not credit neutron absorbing material located outside the active fuel region of fuel assemblies seated in the rack.

Average weight loss (including expanded scope coupons) is 18.02%. Average weight loss adjusted for the erosion hole is 13.82%.

In summary, both average weight loss and areal density measurements recorded during the surveillance are within the acceptance criteria specified in the long term coupon surveillance program.

#### Reference

1. Letter from D. V. Pickett (NRC) to J. A. Spina (CCNPP), dated August 27, 2008, Amendment re: Long-Term Coupon Surveillance Program