PR 72
(71FR25782)

(5)

DOCKETED
USNRC

May 31, 2006 (11:18am)

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

May 24, 2006

Secretary, U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
ATTN: Rulemaking and Adjudication Staff

To Whom It May Concern,

Enclosed is my letter of concern regarding the usage of Boral® aluminum boron carbide neutron absorber for criticality control proposed on the Transnuclear, Inc. NUHOMS® HD Systems Rulemaking Certificate # 72-1030 RIN 3150-AH93 for your review.

If you have any questions – please contact me at anytime.

Sincerely,

Thomas G. Haynes III
Inventor of METAMIC® Neutron Absorber Products
848 Kensinger Road
Lakeland, FL 33815
Phone(863) 709-9448 (x100)

Template=SECY-067

SECY-02

SENT BY E-MAIL TO SECY@NRC.GOV

May 25, 2006

ATTN: Mr. Mark Delligatti / Chief
NRC Rulemaking & Guidance Branch, Section B
Division of Industrial Safety and Medical Nuclear Safety, NMSS

Reference: Transnuclear, Inc. NUHOMS® HD Systems Rulemaking Certificate #72-1030
RIN 3150-AH93

Dear Mr. Delligatti:

I have reviewed the proposed certificate on the NUHOMS HD cask system placed in the above docket for public comment. I have a significant adverse comment with regard to one critical item in the certificate which relates to the authorization to use Boral® for criticality control. Since criticality control is a very, very important function in a cask, the list of permitted materials should be carefully considered by the NRC. That does not seem to be the case in this instance. You, the NRC, have yourselves issued a Generic Safety Issue #196 entitled "Boral Degradation" to study the problem. NRC's decision to study the potential of degradation of Boral was an appropriate one because the reports of Boral's malfunction have been coming from all corners of the earth for years and years. The evidence of Boral's swelling and hydrogen generation in laboratory testing in Spain caused that country's regulator to ban Boral from all casks. Here in the U.S. also, Boral has exhibited swelling, blistering, and instances of major hydrogen gas generation in dry cask fuel storage applications.

Below is an outline of recent cases which have experienced unacceptable performance by Boral:

- Out West in Washington State, a Holtec-supplied canister began to give off copious quantities of gas while it was sitting in the pool. The gas was determined to be hydrogen coming out of Boral in the fuel basket, which is very explosive at moderate concentrations. That experience forced Holtec to switch to Metamic®, which is porosity-free.

- FP&L Energy Seabrook Station filed a 10CFR Part 21 (Docket #50-443) for Boral® coupons which exhibited bulging and blistering of the aluminum cladding in a wet fuel storage rack system (copy attached).

- Recent characterization work by cask suppliers and industry experts continue to provide confirmation of sporadic swelling of Boral in the laboratory.

AAR has been manufacturing Boral for over 30 years and users are still experiencing problems with the material. The most disconcerting aspect of the issue is that the Boral problems occur on a **random basis** and it is impossible to predict the product's performance because of uncertainty in the level of porosity in the aluminum boron carbide core of the cladded product.

I understood when NRC tolerated the use of Boral ten, or even five years ago, because fully dense metallic neutron absorbers were not commercially available then. Today, that is no longer the case. Porosity free, aluminum alloy-based neutron absorbers with high boron content are now produced by several suppliers, including our company. In 2006, using Boral has only one advantage: cost. By using Boral, the cask supplier will save a few thousands of dollars on each canister – perhaps 3%-5% of the cask's cost. Is this saving worth putting the health and safety of workers who load the cask at risk? Is it fair to expect these men to be striking a weld torch to weld a lid while an explosive gas is percolating underneath it? I think that you should give Boral a good hard look, and decide whether you should permit the industry to continue to play Russian Roulette with Boral and its hydrogen gas. Ignoring this matter would undermine your mission as a regulator.

From a metallurgical point of view, the most consistent performance will be demonstrated from an aluminum boron carbide neutron absorbing product which exhibits 100% of theoretical density. Only a fully dense neutron absorber will completely eliminate the potential of swelling and hydrogen gas generation phenomenon.

Sincerely,

Thomas G. Haynes, III
Inventor, Metamic® Neutron Absorber

Attachment: FPL Energy's Part 21 Filing to the USNRC dated October 6, 2003

FPL Energy
Seabrook Station

FPL Energy Seabrook Station
P.O. Box 300
Seabrook, NH 03874
(603) 773-7000

October 6, 2003

Docket No. 50-443

NYN-03082

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Seabrook Station
Boral Spent Fuel Pool Test Coupons
Report Pursuant to 10 CFR Part 21.21

On September 15, 2003, FPL Energy Seabrook, LLC (FPLE Seabrook) reported a condition involving Boral spent fuel pool test coupons (Event #40159). Specifically, inspection of test coupons revealed bulging or blistering of the aluminum cladding. The spent fuel pool racks were built by Westinghouse Electric Corporation using Boral material manufactured by AAR Inc of Livonia, MI. In accordance with the requirements of 10 CFR 21.21(d)(3), Attachment A provides the 30-day written report of an identified defect potentially associated with a substantial safety hazard

Should you have any questions regarding this letter, please contact Mr. James M. Peschel, Regulatory Programs Manager, at (603) 773-7194.

Very truly yours,

FPLE Energy Seabrook, LLC

Mark E. Warner
Site Vice President

IE19

cc: H. J. Miller, NRC Regional Administrator
V. Nerses, NRC Project Manager, Project Directorate I-2
G. T. Dentel, NRC Senior Resident Inspector

Attachment A

10CFR21.21(d)(4) requires that the written report required by this paragraph shall include, but need not be limited to, the following information, to the extent known:

(i) Name and address of the individual or individuals informing the Commission.

Mark E Warner
Site Vice President
FPL Energy Seabrook, LLC
Seabrook Station Unit 1
PO Box 300
Seabrook, New Hampshire 03874

(ii) Identification of the facility, the activity, or the basic component supplied for such facility or such activity within the United States which fails to comply or contains a defect.

Boral Spent Fuel Storage Racks

(iii) Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect.

The spent fuel pool racks were supplied by Westinghouse Electric Corporation using Boral material manufactured by AAR Inc. of Livonia, MI.

(iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.

FPLE Seabrook has identified an abnormality of a Boral test coupon which was removed from the Spent Fuel Pool for inspection. Boral test coupons (Boron carbide & Aluminum Composite Material) have been located in the Spent Fuel Pool as monitoring specimens to assess the performance of similar Boral neutron poison material incorporated into the Spent Fuel Pool Racks.

The boron-10 areal density in the Boral has been measured via neutron attenuation testing. This testing determined that areal density was within specification and no loss of control material existed. Furthermore, the impact of the blistering on the flux trap has been determined to be small and within bounds of the criticality analysis. Thus, the Boral is presently performing its design function.

However, the rate of blister formation and the long-term effects of these blisters on the criticality analysis are not known.

Because of the uncertainty in the future state of the Boral, Seabrook will implement a Boral Monitoring program and add a blistering allowance in the Spent Fuel Pool criticality curves.

(v) The date on which the information of such defect or failure to comply was obtained.

The 10CFR 21.21 reportability evaluation was completed on September 15, 2003

(vi) In the case of a basic component which contains a defect or fails to comply, the number and location of all such components in use at, supplied for, or being supplied for one or more facilities or activities subject to the regulations in this part.

Six Boral racks constitute 576 of the 1236 storage cells in the spent fuel pool. The spent fuel storage racks are freestanding self-supporting modules.

(vii) The corrective action, which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.

FPLE Seabrook has completed an analysis and review of industry operating experience related to defects detected on Boral monitoring coupons. As a result of this evaluation, FPLE Seabrook has determined that a substantial safety hazard does not currently exist in the Seabrook spent fuel racks. This conclusion is based on the fact that boron-10 areal density in the Boral has been measured and determined to be within specification and the impact of the blistering on the flux trap has been determined to be small and within the bounds of the criticality analysis.

However, the rate of blister formation and the long-term effects of these blisters on the criticality analysis are not known.

Because of the uncertainty in the future state of the Boral used to manufacture the spent fuel racks, FPLE Seabrook will implement a Boral-monitoring program and add a blistering allowance in the SFP criticality curves. Both of these actions are currently under development and are anticipated to be in place by September 30, 2003.

(viii) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.

None.

To: Paul V. Gurney/NAESCO@NAESCO, Kevin J. Randall/NAESCO@NAESCO
03/18/04 02:52 PM cc:
Subject: BORAL Blisters @ Humbolt

(Embedded image moved to file: pic22466.pcx)

(Embedded image moved to file: pic04678.pcx)

Paul,

John Galle, Senior Design Engineer for PG&E, Humbolt Bay Power Plant, Eureka, CA reports by phone today that BORAL fuel sleeves have been inspected at Humbolt as a result of the Seabrook BORAL Part 21 report. The BORAL sleeves are used to add subcriticality margin to the Humbolt SFP for seismic events. The fuel has decayed substantially as Humbolt is a first generation BWR shut down for many years. The BORAL sleeves ~ 5" on a side are formed by folding a sheared sheet of BORAL on three corners to form the sleeve were the unattached sheared edges meet to form the forth corner. The sleeves clip onto the fuel assemblies which are loaded into the SFP Racks.

Blisters in close proximity to the sheared edge were observed on 22 sleeves. The number of blisters per sleeve ranged from 1 or 2 up to as many as 92 on a single sleeve. An average sleeve may have approximately 50 blisters. The typical blister observed was characterized as being approximately 0.25 " in diameter and about 1/16" to 1/8" high.

John Galle (PG&E) and Jim Hobbs (AAR) will be participating in a meeting with the NRC on April 21, 2004 to discuss the BORAL degradation issue.

Alan


pic22466.pcx