VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

August 9, 2007

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

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NL&OS/ETS
Docket Nos. 50-338
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License Nos. NPF-4
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VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
NORTH ANNA POWER STATION UNITS 1 AND 2
PART 21 NOTIFICATION – IDENTIFICATION OF DEFECT

Pursuant to 10 CFR 21.21(d), Dominion is providing the required 30-day follow-up written notification of the identification of a defect. This information was initially reported to the NRC Operations Center on July 27, 2007. Specifically, internal cell resistance measurements obtained on an ENERSYS (EXIDE) battery cell (model 3CA-5) identified a possibly degraded cell. Subsequent destructive testing revealed unexpected, significant corrosion within the battery. The attachment to this letter provides the information requested by 10 CFR 21.21.

This letter does not establish any new commitments. Should you have any questions or require additional information, please contact Mr. Thomas Shaub at (804) 273-2763.

Very truly yours,

William R. Matthews
Senior Vice President - Nuclear Operations

Attachment

10 CFR 21(d) - 30 Day Notification - ENERSYS (EXIDE) Batteries

cc: U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Suite 23T85
Atlanta, Georgia 30303

Mr. J. T. Reece
NRC Senior Resident Inspector
North Anna Power Station

Mr. R. A. Jervey
NRC Project Manager
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Mail Stop 8-G9A
Rockville, Maryland 20852

Mr. S. P. Lingam
NRC Project Manager
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Mail Stop 8-G9A
Rockville, Maryland 20852

Mr. J. E. Reasor
Old Dominion Electric Cooperative
Innsbrook Corporate Center
4201 Dominion Blvd.
Suite 300
Glen Allen, Virginia 23060

ATTACHMENT

10 CFR 21(d) - 30 DAY NOTIFICATION

ENERSYS (EXIDE) BATTERIES

VIRGINIA ELECTRIC AND POWER COMPANY
(DOMINION)
NORTH ANNA POWER STATION UNITS 1 AND 2

10 CFR PART 21 - 30 DAY NOTIFICATION

Abstract:

Internal cell resistance measurements obtained on one of the commercially dedicated safety-related emergency diesel generator (EDG) batteries identified a possibly degraded cell. The affected cell was replaced and subsequent destructive testing revealed significant corrosion within the battery.

Component Information (as applicable):
Manufacturer: ENERSYS (EXIDE)
NSSS/A-Model Number:
Part Number: 3CA-5

Description:

In 2005, Internal Operating Experience from Virginia Electric and Power Company (Dominion) Substation Engineering communicated a potential long-term degradation issue associated with EXIDE model 3CC-7 batteries. The degradation was the result of an improperly made connection during the manufacturing process at EXIDE'S (ENERSYS) facility in Sumter, SC, during the mid to late 1990's. There are no batteries of this specific model at North Anna, however, the commercially dedicated batteries (EXIDE model 3CA-5) for the EDGs are of a similar design and were manufactured at the same facility using the same process.

The battery jars susceptible to this process have a serial number beginning with "05", which indicates they were manufactured in the Sumter facility. There are no visual inspections that can definitively determine if any of these batteries are exhibiting premature degradation. However, susceptible cells may be detected by measuring the cell internal impedance, resistance, or conductance.

On March 24, 2005, cell internal resistance readings were obtained on one of the EDG battery banks using an Alber cell-corder. Out of sixty (60) cells, three (3) exceeded the overall average for the battery string and on a fourth cell no reading could be obtained, indicating a degraded cell. The affected cell was replaced and subsequent destructive testing revealed significant corrosion at the positive post.

An earlier Part 21 evaluation was performed (2005) and it was concluded that this was not a substantial safety hazard because the defect would be identified through normal battery testing before a battery was rendered incapable of performing its function. A more recent review of this issue along with discussions with NRC personnel has resulted in re-evaluation of this earlier conclusion. Specifically, without the new quarterly internal cell resistance testing that was created, the Technical Specification required battery surveillances (weekly, quarterly and 18-month) would not be sufficient to detect this internal degradation. Only the 5-year EDG battery capacity test would be able to detect the condition and then only after internal resistance advanced to the point where capacity was <80% of manufacturers rating. As such, degradation could

progress between 5-year tests potentially resulting in inoperability without detection.

Causes:

Equipment Specification, Manufacture, and Construction- Fabrication Deficiency

The internal lead post and connector/terminal within the battery jar were bonded together by hand using a high temperature heating process referred to as a "burn". If the temperature used during the "burn" is too low, cracks and voids are left between the post and connector. Acid seeps into the voids, causing the post to corrode and resulting in an open circuit over an extended period of time.

Corrective Actions:

Cell internal resistance readings were obtained on all four (4) battery banks for the EDGs. There was one cell for which no reading could be obtained and was replaced immediately. A second cell had a reading that was nearly four times the average of the associated string and was subsequently replaced as a proactive measure during the EDG maintenance outage. Three (3) other cells were noted with higher than average readings that are not considered to be operability concerns. In total, five (5) cells out of a total of 240 were found with higher than expected internal resistance values.

On May 11, 2005, Dominion posted a nuclear network operating experience notice (INPO-OE20620) on the INPO website to alert the industry of the potential degradation of certain Exide multi-cell battery jars. In addition, Dominion verified that EXIDE model 3CA-5 batteries were not installed at the remaining Dominion units.

Periodic testing of all North Anna EDG batteries was put in place to monitor for this defect (increases in internal cell resistance readings) to confirm continued operability of all EDG batteries. In parallel, plans were launched to replace the affected EDG batteries with models that are not susceptible to this defect. Unit 2 batteries have been subsequently replaced and Unit 1 batteries will be replaced during the fall 2007 outage.

Initial notification of the Part 21 (NRC event number 43527) was made on July 27, 2007 to the NRC Operations Center, Duty Officer, Mr. Mark Abramovitz, by Mr. Thomas Shaub of Dominion.

Safety Significance:

Batteries with this defect may potentially degrade to the point where an open circuit results, which could render them unable to provide power to required safety-related emergency loads. For the condition found at North Anna, the degraded cell would not have prevented the battery from performing its design function. Furthermore, the battery had met all required surveillance testing and the EDG was successfully started and loaded during the most recent refueling outage. In addition, float current greater than zero had been measured during weekly battery tests, indicating a complete circuit.