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July 23, 2007

BVY 07-049

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Subject: **Vermont Yankee Nuclear Power Station**  
**Docket No. 50-271 (DPR No. 28)**  
**Vermont Yankee RFO 26 Steam Dryer Inspection Results**

Dear Sir or Madam:

This letter provides information in accordance with Vermont Yankee (VY) Operating License Conditions M.5 and M.6 regarding the results of steam dryer inspections.

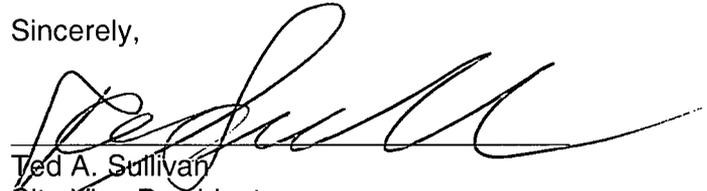
During the spring 2007 refueling outage (RFO-26), a visual inspection was conducted of the VY steam dryer by General Electric Company (GE). The inspection examined accessible, susceptible portions of the dryer as recommended in GE Service Information Letter (SIL) No. 644, Revision 1. The inspection also included past modifications and prior indications that were dispositioned use-as-is. The attached report provides a summary of the inspection results.

The indications identified during the inspection have been entered into the VY Corrective Action Program. Each indication was evaluated and determined to be acceptable for continued operation. The detailed inspection results are available for inspection.

There are no new commitments contained in this submittal.

If you have any questions or require additional information, please contact Mr. David Mannai at (802) 258-5422.

Sincerely,

  
Ted A. Sullivan  
Site Vice President  
Vermont Yankee Nuclear Power Station

Attachment : Vermont Yankee Steam Dryer Inspection Results

cc: (next page)

Aool  
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Attachment

Vermont Yankee Nuclear Power Station

Vermont Yankee Steam Dryer Inspection Results

## VERMONT YANKEE STEAM DRYER INSPECTION RESULTS

### General inspection results

The Vermont Yankee (VY) Steam Dryer inspections satisfied VT-1 requirements as recommended by SIL No. 644, Rev.1 which requires inspection of accessible, susceptible portions of the dryer. The results of the Steam Dryer visual inspection indicate that the dryer is in good condition. This conclusion is based on relatively few new indications identified during RFO-26 which are acceptable to "use-as-is" and previously identified indications that have not grown. The areas where these indications were identified will be re-inspected during RFO-27 and RFO-28, consistent with VY's Operating License.

Based on the RFO-26 examinations, VY's Steam Dryer is free of structural damage. These inspections included the modifications made on the Steam Dryer in RFO 24. The Steam Dryer condition is consistent with the analysis and data evaluation performed for the power uprate which shows VY's steam piping does not create the conditions to induce structurally damaging loads on the Steam Dryer.

### Past modifications

The dryer design changes, implemented during RFO-24, included modifications to vertical hood plates, reinforcing gussets, upper and lower horizontal cover plates, bracing brackets and tie bars. The RFO-24 Steam Dryer modifications are intact as demonstrated by the visual inspection results.

### Prior "use-as-is" indications

Forty seven (47) indications from RFO-25 were re-identified. The interior of the dryer cannot be cleaned by brushing due to inaccessibility. Therefore, the normal material layer on the surface of the dryer cannot be removed, as it is on the exterior, for inspection. This does not affect the ability to perform a VT-1 inspection.

There were no discernable changes observed on the forty seven (47) indications that were re-identified. All of these indications were on the dryer interior. Forty five (45) of these indications were on the dryer vane end panels and two (2) were on the drain piping. Previous evaluations from RFO-24 and RFO-25 are still valid for dispositioning these indications "use-as-is." RFO-26 General Electric Indication Notification Reports (INRs) 5 and 9 through 20 document these indications. One (1) of these indications was determined to be non-relevant and is documented on INR 18.

### Additional Indications

Twenty nine (29) new relevant indications were observed during RFO-26. Each of these indications has been evaluated and determined to be acceptable to "use-as-is" for continued operation. They will be inspected again next refueling outage.

Nineteen (19) of these indications were identified on Vertical Guides at 175° and one (1) on the Vertical Guide at 215°. These are documented on INR 8. The indications at both locations are perpendicular to the vertical guide channel welds, consistent with Inter-Granular Stress Corrosion Cracking (IGSCC) and stress relief. Based on the photos of the 215° location, it appears that the surface of the drain channel and skirt plate have been cold worked, as evidenced by grinding marks. Therefore, it is probable that these are surface indications and that they will not propagate significantly. The indication at the 175° location is close to the horizontal weld, where the additional weld could increase the susceptibility of the material to IGSCC. The presence of this additional heat affected zone likely contributed to the observed crack extension. Surface cold working, from indications of grinding marks, may have also contributed to the cracking. Therefore, these indications are most likely IGSCC and are not expected to propagate significantly in the future. In the unlikely event that these indications were to propagate at each crack tip, they would have an insignificant impact on the skirt and guide channel structural integrity.

Three (3) new indications were identified on the Steam Dam Support at 35°. This was documented by GE INR 7. These are located in the edge of the vertical end plate that supports the Bank A steam dam near the 35° lifting eye. Given that the indications are located away from stress risers, such as the toe of the weld, and that there are three indications rather than one, fatigue is unlikely. Fatigue would result in a single crack without the jagged appearance observed in this indication. In addition, there does not appear to be any significant depth to these indications. No cracking was observed on either side of the plate and would therefore be consistent with a recent IGSCC. This plate is from original dryer fabrication and may have been cut or ground such that the IGSCC susceptibility was increased due to cold working. The 2004 installation of the reinforcement bracket may have induced additional residual stress in this location such that IGSCC was initiated. This would explain why the bottom indication has the largest opening, consistent with the weld residual stress pattern. In the unlikely event that these cracks were to propagate into the plate, this would have an insignificant impact on the structural support for the steam dam and would therefore not pose a risk of a loose part.

Five (5) indications documented in INRs 1 and 2 are on the dryer lifting rods at 144° and 324° and the dryer leveling screws at 144° and 215°. These welds are not structural welds, but were created to prevent rotation of the lifting rods and leveling screws. The jagged configuration of the cracks in these welds still prevents rotation; therefore the welds are still performing their intended function. The lifting rod stitch weld cracks are most likely fatigue, possibly resulting from a cyclic loading condition imposed during removal and replacement of the steam dryer during refueling outages. In the unlikely case that a lifting rod were to rotate during operation, it cannot become a loose part because the steam dryer hold down bracket in the Reactor Pressure Vessel closure head limits the upward motion of the lifting rod. Similarly, the leveling screw can only move upward by two inches as that is the length of internal thread and the remaining four inch deep counter bore will prevent the screw from becoming a loose part.

One (1) new indication was found on dryer vane end panel HB-V04 and is documented in INR 10. This is similar to the vane end panel indications that were documented and evaluated in RFO-25. These RFO-25 indications were determined to be IGSCC and the HB-V04 indication was determined to be the same. There are no structural consequences on the vane end panel indications and postulated indications extending the full section width of the channel geometry would not create a loose part.

There were three (3) additional indications documented in INR 16 which are not included in this count because they have been determined to be non-relevant. Non-relevant means that they were observed by the inspector, but are not actually flaws. In this case they were determined to be tooling marks or scratches.

### Conclusion

The VY Steam Dryer inspection has been extensive and the results show that the dryer is in good condition. The indications re-inspected during RFO-26 have not grown and remain acceptable per previous evaluations for continued operation. New indications have been entered into the VY Corrective Action Program, evaluated and are acceptable as-is for continued operation. The Steam Dryer will be inspected and the results provided for RFO-27 and RFO-28, consistent with VY's Operating License.