RAS M-337

SUBJECT: OE21421 - (Preliminary) Loss of condenser vacuum due to air in-leakage and a degraded steam jet air ejector train

*** RESTRICTED AND CONFIDENTIAL ***

Abstract: With Dresden Unit 3 at 100 percent power, a derate was required to maintain condenser vacuum after a step increase in air in-leakage to the condenser. The event was compounded by operation on a degraded steam jet air ejector train.

Reason for Message: When evaluating steam jet air ejector trains for operation during summer months consider the health of the trains. Summer months are the largest challenge for air ejectors when condensate temperatures reach their highest levels and degrade the steam jet air ejector inter condenser vacuum and, as a result, the efficiency of the steam jets. Had the 3A steam jet air ejector train been in service, Dresden Unit 3 would have been able to operate with the elevated in-leakage. Additionally, the most probable location of the in-leakage is from the vacuum pump piping that ties into the center waterbox. This was identified as a suspect location of leakage at Quad Cities in 2001.

Event date: 8/15/05.

Station/ Unit Name: Dresden /Unit 3
NSSS/A-E: Westinghouse/ Sargent & Lundy
Turbine Manufacturer: Westinghouse

Maintenance Rule Applicability: Yes

Component Information: Unit 3B Second Stage Air Ejector
Manufacturer: Ingersoll Rand (now alstom power)
Model Number: #1 4MF-24, #2 4MF-8
Part Number:

Description:
The following chronology describes the course of this event and associated actions:

April 2005 Dresden Unit 3 shifted to 3B offgas train for maintenance on the 3A train
8/15/05 Offgas flow increases to 196 SCFM
8/19/05 Reduced load to 860 Mwe due to SJAE "chugging"
8/20/05 Indication of leak in condenser from Helium testing
8/21/05 Attempted to increase load to 912 Mwe but had to abort due to condenser backpressure transient and onset of SJAE "chugging"
8/25/05 Reduced load to 500 Mwe and shifted to the 3A offgas train
8/26/05 Returned to full power (912 Mwe) on the 3A offgas train

Causes:

The most probable cause of air in-leakage (unconfirmed because outage has not been taken yet to confirm the leak) is from the circulating

Template Seq-028

DS-03

U.S. NUCLEAR REGULATORY COMMISSION

In the Matter of Entergy Nuclear Vermont Yankee LLC

Docket No. 50-271 Official Exhibit No. E4-17-VY

OFFERED by: (Applicant/Licensee) Intervenor _____

NRC Staff Other _____

IDENTIFIED on 7/23/08 Witness/Panel NEC 4

Action Taken: (ADMITTED) REJECTED WITHDRAWN

Reporter/Clerk MAC

water vacuum pump (water side of the condenser used for system start-up)

The most probable cause of the lost generation is degraded 2nd stage Steam Jet Air Ejector on the 3B train.

Corrective Actions:

Repair the condenser waterbox leak during next outage of sufficient duration
Repair the 3B steam jet air ejector during next refueling outage

Safety Significance:

None

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