

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

July 3, 1992

U. S. Nuclear Regulatory Commission  
Region II - Suite 2900  
101 Marietta Street, N. W.  
Atlanta, Georgia 30323

Serial No. 92-354  
NO/RJS/GDM R5  
Docket No. 50-280  
50-281  
License No. DPR-32  
DPR-37

Gentlemen:

**VIRGINIA ELECTRIC AND POWER COMPANY**  
**SURRY POWER STATION UNITS 1 AND 2**  
**SPECIAL REPORT**  
**WASTE GAS HOLDUP SYSTEM**  
**HYDROGEN MONITORING INSTRUMENTATION**

Surry Technical Specification 3.7.E.2 requires that a special report be submitted to the Commission (Region II) when the Waste Gas Decay Tank (WGDT) explosive gas monitoring instrumentation is inoperable for greater than 30 days. A special report was previously submitted (Serial 91-340 dated 6/17/91) describing difficulties encountered in initially placing these instruments into service. Since this instrumentation was placed into service on July 3, 1991, the hydrogen monitors have been required to be taken out of service for several extended maintenance periods, none of which exceeded 30 days. The associated oxygen monitors have operated reliably throughout this period.

During the most recent maintenance period, pressure sensors were replaced to enhance instrumentation performance. The new sensors required changes to the sensor electronics. Specifically, the internal Erasable Programmable Read Only Memory (EPROM) integrated circuitry was modified at the vendor's facility. These modifications were not completed in time to allow the instruments to be returned to service within 30 days. We are submitting the enclosed special report, Attachment 1, to report an instrument out-of-service period greater than 30 days and the cumulative out of service time experienced to date.

During these maintenance periods, we are maintaining compliance with Technical Specification Table 3.7-5(a), Action 1, by collecting grab samples on a daily basis. The hydrogen monitors have been returned to service and their performance is being monitored and evaluated against the the daily grab sample results, prior to declaring the monitors operable. If the hydrogen monitors are not restored to an operable condition by July 31, 1992, we will provide an update to this report.

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Due to the difficulties encountered in maintaining the WGDT hydrogen monitoring instrumentation operable, the design basis for this instrumentation was reexamined. This reexamination concluded that potentially explosive gas mixtures can be avoided through the use of oxygen monitoring instrumentation alone. Therefore, a Technical Specification change is being prepared which will request the current operability requirement for WGDT hydrogen monitors be deleted.

The attached special report was approved by the Station Nuclear Safety and Operating Committee. Should you have any questions or require additional information, please contact us.

Very truly yours,



W. L. Stewart  
Senior Vice President - Nuclear

Attachment

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

Mr. M. W. Branch  
NRC Senior Resident Inspector  
Surry Power Station

## ATTACHMENT 1

### SPECIAL REPORT WASTE GAS DECAY TANK MONITORING INSTRUMENTATION

The Waste Gas Holdup System hydrogen and oxygen monitors were installed in December, 1990. Following installation of the new monitors, calibration difficulties and component reliability problems were encountered. These difficulties were described in a special report (Serial 91-340 dated 6/17/91) and resulted in a delay in placing the monitors in service until July, 1991. Since placing the monitors in service, two types of recurring maintenance problems have been encountered. Although neither of these problems have resulted in the instrumentation being out of service for greater than 30 days, the cumulative out of service time and extensive maintenance required to maintain these monitors pose an instrumentation reliability concern. During periods when the monitors were out of service, the requirements to obtain WGDT samples every 24 hours were in effect as specified in Technical Specification 3.7, Table 3.7-5(a).

The first maintenance problem is a failure of the monitor sample pump return spring. Failure of this spring leads to immediate sample pump failure or causes conditions which lead to the ultimate failure of the pump shaft or casing. This failure mechanism has caused the failure of a monitor pump approximately once per quarter since July, 1991. Sample pump flow detectors were installed in September, 1991 to provide the operators a means of readily detecting sample pump failure. The vendor has developed a potential solution to the return spring deficiency by redesigning the sample pump spring material to be Type 17-7 PH/C stainless steel vice Type 316 stainless steel. The replacement pump springs were received and installed during June, 1992.

The second and more significant maintenance problem is instrument drift in the hydrogen monitor. This drift typically manifests itself within a week after the analyzer has been calibrated. The drift has been attributed to the leakage of electrolyte from the hydrogen sensing probes, necessitating weekly probe refurbishment. During the refurbishment process, electrolyte level is replenished, a new membrane is installed, and the probe is recalibrated. Sensing probe refurbishment and recalibration is a particularly manpower intensive evolution and has been the primary cause of monitor unavailability due to maintenance. The vendor has proposed a modification to install a new sensor membrane protection cap which should reduce, if not eliminate, sensor electrolyte leakage and improve sensor reliability. This modification was accomplished in conjunction with the pressure sensor replacement discussed below during June, 1992.

In addition to these two recurring problems, we have also determined that replacing the installed analyzer pressure sensors, with sensors more compatible with the WGDT operating pressures, would enhance analyzer accuracy.

These pressure sensors, which compensate for WGDT pressure, input into the analyzer circuitry for indicated hydrogen and oxygen concentration. Replacement of the installed pressure sensors also required a change to the sensor electronics. Specifically, programming changes for the EPROM integrated circuitry were performed at the vendor's facility. It was anticipated that this modification would be completed and the monitors returned to service within 30 days. Unfortunately, delays at the vendor's facility in Switzerland, prevented the monitors from being returned to service within 30 days.

We are continuing our efforts to return and maintain the monitoring channel in service. Until such time, we are maintaining compliance with Technical Specification, Table 3.7-5(a), Action 1, by continuing the collection and analysis of local samples.