

## ATTACHMENT A

WNP-1/4  
Docket Nos. 50-460 and 50-513  
Reportable Condition 10 CFR 50.55(e)  
Usage of Incorrect Vertical Amplified  
Response Spectra for Component Cooling and  
Makeup Pump Area "HVAC" System  
Train "B" Equipment

### INTERIM REPORT

#### Background

UE&C notified WPPSS on June 11, 1980 of a defective condition which existed in the design of the floor supporting the component cooling and makeup pump area "HVAC" system train "B" equipment. As a result of a project audit, the usage of an incorrect vertical response spectra for the train "B" HCA System equipment was discovered.

#### Description of the Deficiency

The Component Cooling and Makeup Pump Area is in the GSB between column lines 1-4 and U-J at elevation 399'-0" and 421'-0". The major safety related equipment located in this area are Makeup Pumps (MUS-PMP-1A, 2B & 3C) and Shutdown Cooling Water Pumps (NSW-PMP-1A and 2B).

The Component Cooling and Makeup Pump Area HVAC System (HCA) provides heating, cooling, ventilation, humidity control and atmospheric cleanup to this area. The HCA System is safety related and consists of two redundant trains of equipment located in the GSB at elevation 455'-0" between Col. Line 1-4 and G-H. As a result of a project audit, the application of an incorrect vertical response spectra for the train "B" HCA System equipment (HCA-FAN-2B and HCA-ACT-1B & 2B) was discovered. The subject equipment is located on a removable floor area. However, the equipment was qualified per the response spectra of the adjoining floor which was lower in magnitude than that for the removable floor.

#### Safety Implications

The HCA system is required to maintain the temperature in the Component Cooling and Makeup Pump Area within a maximum of 95°F during normal plant conditions and within a maximum of 130°F following LOOP concurrent with SSE or LOCA concurrent with LOOP and SSE. The above temperatures are maintained by operating either HCA system train "A" equipment or train "B" equipment.

Following SSE, the HCA train "B" equipment could fail to operate due to the fact that the original design was based on the lower magnitude of vertical amplified response spectra. If so, train "A" equipment is capable of maintaining the temperature within the above limit. However, if a single failure is postulated in train "A" of the HCA system, then this would result in complete loss of HCA system.

### Safety Implications (Cont'd)

With complete loss of HCA system, the temperature in the Component Cooling and Makeup Pump Area is expected to rise continuously and reach a steady state value of approximately 235°F in about 20 days. Credit is taken for the heat sinks (concrete) present in the area in the temperature rise analysis.

The safety related pump motors (Makeup Pump Motors and Shutdown Cooling Water Pump Motors) located at the 399'-0" and 421'-0" levels would be affected by the increased space temperature. These pump motors are provided with Class "B" insulation. NEMA Standard MG-I requires that with the maximum ambient temperature of 40°C (104°F), the temperature rise in the windings should not exceed 80°C (176°F). The temperature rise for the Makeup Pump Motors is found to be 70°C with the ambient temperature of 50°C. The temperature rise for the Shutdown Cooling Water Pump Motors is found to be 80°C with the ambient temperature of 27°C. These motors are expected to be qualified for one abnormal condition (LOOP and/or LOCA), in addition to the normal operation. For this qualification purpose, the maximum temperature in a day is 130°F (for 5 hours) and the 29 days average temperature is 117°F (45°C).

Increase in space temperature would result in increase in the motor winding temperature. As a rule of thumb, operating these motors with every 10°C higher than maximum design temperature could reduce the life of the motor insulation to half. However, operating these motors at very high temperatures could result in insulation failure.

The final steady state temperature inside the Component Cooling and Makeup Pump Area is relatively high compared to the temperature for which the safety related motors are "qualified". Assuming no alternate cooling provisions are made during the time prior to the attainment of this temperature, the "expected" life of the Makeup Pump and the NSW Pump Motors may be significantly reduced and the motor windings could fail after a short period of time. This would result in loss of the makeup and/or heat removal with respect to the reactor coolant system, resulting in an inability to cool down the plant and/or to maintain the plant in a safe shut down condition.

### Corrective Action

A structural frame has been designed to be installed below the removable concrete floor. This structural modification results in a modified response spectra identical to that for which the subject HVAC equipment was qualified. Final documentation and design details of the modification is scheduled for August 15, 1980.