Consumers Power Company

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • (517) 788-0550

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Director, Nuclear Reactor Regulation
Att Mr Dennis M Crutchfield, Chief
Operating Reactors Branch No 5
US Nuclear Regulatory Commission
Washington, DC 20555

DOCKET 50-255 - LICENSE DPR-20 -
PALISADES PLANT - SEP TOPIC IX-5, VENTILATION SYSTEMS

By letter dated January 29, 1981, the NRC requested additional information concerning ventilation systems design and operation at the Palisades Plant. The attached information is being provided in response to that request.

As you will note, some of the responses are somewhat subjective in that they are based on approximately ten years of plant operating experience rather than design or test data. We are, however, in the process of finalizing the scope of a very extensive group of ventilation system modifications. These modifications have been developed as a result of control room habitability and electrical equipment qualification considerations and will affect ventilation in virtually the entire auxiliary building. For that reason, it was not considered an efficient use of resources to perform tests and, in some cases, calculations to further address the existing systems when modifications will invalidate much of this information in the relatively near future. We trust, however, that this information will be sufficient to address the SEP concerns on Palisades' ventilation systems while modifications are being performed.

Robert A Vincent
Staff Licensing Engineer

CC Director, Region III, USNRC
NRC Resident Inspector-Palisades Plant

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SEP TOPIC IX-5, VENTILATION SYSTEMS
RESPONSES TO NRC QUESTIONS OF JANUARY 29, 1981

The following information is provided in response to questions contained in NRC letter of January 29, 1981. Item numbers below correspond to the question numbers in that letter.

I. General - A copy of Bechtel Power Corp. letter 054-0270 dated January 26, 1981, which describes the scope of planned ventilation system modifications, was provided to S. Brown on June 9, 1980. It must be noted that this scope document is still preliminary and has not been formally approved for implementation. Although some details may still be changed, however, we believe that the final scope for these modifications will not be substantially different from this document.

I.1 Failure of either damper would lessen the system's isolation capability until corrective measures are taken. However, system modifications which incorporate redundant dampers are being planned.

I.2 Loss of the redundant unit would result in a gradual increase in control room temperature and humidity until corrective measures are taken. The existing control room air conditioning units are not powered from vital buses. However, modifications are being designed to increase capacity and, at least after RAS, power the units from separate vital buses.

I.3 In the event of fan V-36 failure, outside air flow would effectively be stopped until corrective action is taken. Modifications are planned which will provide redundant fans. The fan is required to be tested per Table 4.2.2 of the Palisades technical specifications. The fan is powered from a vital bus.

I.4 A radiation area monitor is located at the doorway between the control room and the viewing gallery. Smoke detectors are located in the control room. The air intake system does not include radiation monitoring or smoke detection devices. Air sampling using portable samplers is performed in abnormal situations as required by the Emergency Plan implementing procedures.

I.5 System performance is monitored as follows:

a. Radiation - See item I.4 above. Air particulate sampling is accomplished manually.

b. Pressure - a ΔP indicator in the HVAC equipment room shows the ΔP across the control room boundary.

c. Control room air temperature is indicated in the control room.

d. Smoke detectors are also installed in the control room.

Since the heating boiler is supplied from vital power a loss of offsite power will not result in an inoperable heating coil.

I.6 The control room is an interior room. In the event of steam heating coil failure, significant heat is provided by the equipment, lights and personnel. A significant temperature reduction should not occur rapidly, allowing significant time for corrective action to be taken.

I.7 The purge mode provides rapid replacement of control room air with outside air. Fans V-17 and V-34 draw in outside air with damper D-2 closed to prevent recirculation. Air is exhausted with damper D-3 open. With both fans (V-17 and V-34) operating, there is one control room volume air change approximately each three minutes.

II.1 Damper PO-3007 and fan V-7 are controlled manually. In the event damper PO-3007 failed to close (in the event of high radiation detection) one exhaust fan is still running and supply fan V-7 would be stopped. A negative pressure would still be maintained.

II.2 Failure of fan V-7 to trip would provide balanced flow (assuming both exhaust fans were operating) with negligible air loss other than the exhaust through charcoal filters.

II.3 Control room alarms exist to alert the operator in the event of high radiation in the fuel handling area. No pressure indication exists for this area.

II.4 The same control signal causes the exhaust fans and dampers to actuate, which effectively interlocks their operation. A single control system failure can result in loss of exhaust flow.

II.5 Full charcoal filter flow is provided by one exhaust fan. When the charcoal filter is used, therefore, only one fan is operated.

II.6 The exhaust fans are not powered from a vital bus. The exhaust fans are redundant, but is only a single charcoal filter.

II.7 Loss of offsite power will not cause loss of the heating coil, but it will cause a fan loss. The effect would be to stop air exchange with outside air.

With respect to the perceived low inlet temperature, the system has worked well during past winters. Air inlet temperature has not proved to be a problem.

III.1 The normal operating mode is to trip this fan when high airborne activity is present. The fan has been off for extended periods in the past without detrimental effects.

III.2 This system does not perform a function which affects safe shutdown of the plant.

IV.1 The auxiliary feed pump room is served by turbine building ventilation unit 9.

IV.2 There are no ventilation systems interfaces between the turbine building and other area systems which must function following an accident.

V.1 There are two thermostats for each cooler, therefore failure of one thermostat will not result in failure of a cooler to operate. The cooler units are powered from redundant vital buses.

V.2 In the event of a single failure in the isolation dampers, airborne radioactivity would increase until corrective action is taken. The temperature would not increase since the air is still being recirculated through the air coolers. A slight positive pressure could exist in the rooms.

V.3 The air coolers for the engineered safeguards rooms are powered from vital buses. Loss of offsite power does not degrade the system. Equipment located in the rooms are:

HPSI Pumps

Cont. Spray Pumps

LPSI Pumps

Shutdown Cooling Heat Exhangers

High Pressure Control Air Equipment

Related Piping Valves, Controls etc.

V.4 The diesel generator exhaust and air intake are separated by approximately 17 feet of air space.

V.5 The intake structure ventilation system was originally sized for the heat load from large circulating water pump motors as well as the service water pumps and other equipment. When the cooling towers were installed, the circulating water pumps were removed. The capacity of the intake structure system, therefore, is now greatly oversized for the actual heat load. No problems have been observed with the system's ability to maintain acceptable temperatures. Since the building is not leak tight, and doors exist which open to the outside, air flow can be maintained through the building even with multiple fan failures.

A schematic drawing of intake structure ventilation is shown on P&ID M-218.