

NRC QUESTION "B"

RH-5A46

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Question:

How will potential for (i.e. existing OWA where auxiliary heating is required) affect extended RCIC operation during SBO, given there is no AC power for the aux heaters?

Answer and Basis:

Extended RCIC operation during a SBO will not be affected by the fact that there will be no AC power for the aux heaters to deal with potentially low battery room temperatures.

The batteries must be kept at close to optimal temperatures prior to an event so they have the capacity required during the start of an event. Battery room temperature is controlled to ensure the battery cells are not cold prior to a demand event so that their capacity would be reduced to below the needed level. Heating of the battery rooms after the beginning of an event is not required. After the start of an event, there is no problem with low battery temperature due to the self-heating of the cells. Once current begins to pass through the battery's electrolyte, the temperature of the electrolyte goes up.

The critical battery rooms are located on 903' level of the Control Building. The temperature in these rooms is normally controlled by the plant's Control Building HVAC system. The cross-tied SW GW condition occurred during January/February 2004. During that time of year, the Control Building HVAC system is usually operating in "cold weather" mode. While in "cold weather" mode, the Control Building HVAC system employs auxiliary steam to add heat to the cold air provided from the outside into the building. This provides reliable automatic temperature control for the Control Building.

The Control Building battery rooms air temperatures are monitored by temperature switches that actuate the "Control Bldg Essential H&V Low Temp" annunciator, R-1/B-4, at 76°F decreasing. A temperature switch that monitors the Control Building Essential ventilation return air duct temperature also actuates this alarm. It alarms when that switch actuates at 80°F decreasing. When either of these occurs, annunciator response procedure 2.3_R-1 requires operators to determine whether or not the alarm is due to a battery room low temperature. If it is, operators are directed to ensure local indicated room temperatures remain greater than 76°F, and record the local Battery Rooms 1A and/or 1B temperatures in the NOMS narrative logs once per shift. If the local Battery Rooms 1A and 1B temperatures cannot be maintained greater than 76°F, the operators are then directed to deploy the battery room Portable Heating System per Procedure 2.2.38.2. This procedure includes a low temperature limit of 72.5°F, which is still above the design limit low temperature of 70°F.

The Turbine building Operator rounds per procedure 2.1.11.1 Turbine building data Attachment 1, "Turbine Building Data - Modes 1, 2, and 3" includes a tour of the battery rooms four times a day. There is a local wall mounted temperature gauge in each of the critical battery rooms. It is standard practice for the operators to look at the temperature gauge while in each room. When the NOMS narrative logs were checked for entries about battery temperature between 01-01-2004 and 02-29-2004, none were found. Each tour was noted to be SAT and no Notifications were written in the months of January and February 2004 due to low indicated temperature in either critical battery room. Based on this we can presume that the critical battery room temperatures did not drop low enough to challenge the capacity of the critical batteries.

Low indicated temperature in either critical battery room most often occurs during spring and fall periods when the building HVAC system will automatically control temperature with no heating steam available in the "summer-mode" of operation. When in "economizer-mode", the building

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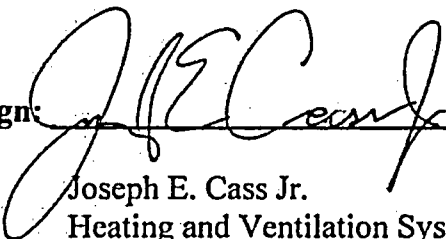
ventilation system is relying predominantly on outside air, with no cooling or heating provided by the HVAC system. During the spring and fall, occasionally the temperatures drop while the auxiliary steam system is shut down and heating steam to the buildings is unavailable. Given cool ambient conditions, air being supplied to the battery rooms is so cool that the heat being generated by equipment in the building is inadequate to keep the air warm. The battery room temperatures drift lower over time. Because of the arrangement of the air movement in the Control Building, the 'A' battery room tends to run slightly cooler than the 'B' room. If the cool ambient conditions continue, battery room temperatures will lower to the point (76°F and lowering) where the alarm actuates. If it continues to drift below 76°F Operations is directed by the annunciator response procedure, to setup auxiliary heating per procedure 2.2.38.2.

The auxiliary heaters rely on AC power provided from welding receptacles. The auxiliary heater is preferably powered from a welding outlet near Control Building Door H105 that is powered from essential 480-volt motor control center MCC-T. Welding receptacles powered from MCC-A, MCC-DG1, or MCC-DG2 can also be used if power from MCC-T is not available or as other plant conditions dictate. All of these sources would be lost during the SBO. The power to the ventilation systems that can supply outside air to the battery rooms would also be lost. No cold air would be continuously added to the battery rooms in an SBO.

Lowering battery room temperatures would not have had an impact on the DC electrical system for the following reasons:

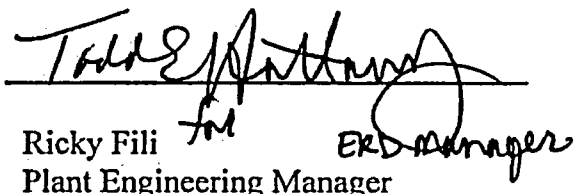
1. The noted condition occurred during the middle of the winter when the Control Building ventilation system was operating in "winter-mode" with the auxiliary steam available for heating. The phenomenon of lowering battery room temperatures has only been a concern during the Spring and Fall when the system is operating for extended periods with no auxiliary steam to provide heating, if needed.
2. The condition associated with lowering battery room temperatures is caused by the supply fans drawing cold outside air into the building at the same time no heat is being supplied by the building's HVAC system. During the SBO, AC power to the ventilation system would be lost and, therefore, there would be no source of cold air supplied to the rooms.
3. The return air duct temperature from the 903 Control Building areas is monitored by a temperature switch that actuates the "Control Bldg Essential H&V Low Temp" annunciator, R-1/B-4, at 80EF decreasing. The alarm never actuated during the January to February 2004 time period. The rooms are inspected by operators four times per day. There is no record of any reports of low temperature conditions during the periods in question.
4. Although the noted condition occurred during the winter months and the building's heating system would be lost during an SBO, the battery room temperatures at the time were being maintained between 77 and 80EF. With this initial heat given off from the discharging battery system and reliance on the batteries being of short duration (8 hours for high pressure injection during SBO), low battery room temperatures would not be of concern.

Sign:



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10-18-2004

Sign:



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10-18-2004