Maine Yankee
RELIABLE ELECTRICITY SINCE 1972

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November 18, 1996
MN-96-154 JRH-96-231

UNITED STATES NUCLEAR REGULATORY COMMISSION
Attention: Document Control Desk
Washington, DC 20555

References:
(a) License No. DPR-36 (Docket No. 50-309)
(b) Letter: G.D. Whittier, MYAPCo to USNRC, "Maine Yankee Licensing Basis For Environmental Qualification in Turbine Building", dated August 14, 1996, MN-96-114
(c) Letter: R.W. Cooper, USNRC to C.D. Frizzle, MYAPCo, " Maine Yankee Licensing Basis for Environmental Qualification in the Turbine Building", dated August 21, 1996.
(d) Letter: J. R. Hebert, MYAPCo, to USNRC, "Maine Yankee Licensing Basis for Environmental Qualification in the Turbine Building", dated October 1, 1996, MN-96-143
(e) Letter: J.R. Hebert, MYAPCo, to USNRC, "Maine Yankee Licensing Basis for Environmental Qualification in the Turbine Building", dated November 5, 1996

Subject: Maine Yankee Licensing Basis for Environmental Qualification in the Turbine Building-Winter Conditions.

Gentlemen:

References (b) and (c) document Maine Yankee's plan to complete the "winter ventilation configuration" High Energy Line Break analysis for the environmental conditions in the turbine building and submit the results to you by October 1, 1996. In reference (d) we informed you that the analytical effort would not be complete until October 11. In reference (e) we notified you of an additional delay. The results of the analytical effort are now available . We also have completed our design for temporary modifications to the turbine building which will allow us to initiate the winter ventilation configuration while preserving the capability to mitigate the effects of a high energy line break.

Analytical Results-Environmental Service Conditions in Turbine Building following HELB/Winter Configuration

The analytical work performed for the Summer Ventilation Configuration, as discussed in reference (b), was partially based on the assumptions of Maine Yankee's submittals in response to Generic Letter 79-01b. This work assumed a double ended rupture (DER) of a 18" main feedwater outlet from the first point heater. A review of the Winter Ventilation Configuration determined that the shorter, but larger, 27" Steam Driven Feed Pump discharge piping should be a candidate for the double ended rupture evaluation.

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A slot break in the next smallest line segment on the outlet of the 1st point heater, a 24" slot, was evaluated and was found to be the limiting break for the Winter Ventilation Configuration. This break does not release sufficient energy to fail the turbine building wall panels and results in higher temperature for a longer duration than the 27" DER. In addition, cases were examined assuming both as electric feedwater pump "on" and a pump "off" scenario. Continued operation of the motor driven feed pumps after the steam driven pump had tripped was shown to be the limiting case.

The Winter Ventilation Configuration also assumed a maximum of 60 degrees F for an outside ambient temperature. It is unlikely that air temperatures in excess of 60 degrees will be experienced at the Plant site until next spring. However, another evaluation was conducted with a Summer Ventilation Configuration with an ambient temperature of 70 degrees. Should outside temperatures exceed 60 degrees, Operations will initiate the Summer Ventilation Configuration.

The winter environmental service conditions are enveloped by the equipment operability reviews performed earlier for the work discussed in reference (b). These reviews continue to conclude that the PCCW/SCCW motors, Switchgear Room equipment, and other required components in the Turbine Building will remain operable under the postulated conditions.

Short Term Modifications for Winter Configuration to Mitigate the Effects of a HELB

To provide the ability to vent the Turbine Building quickly while in the "winter configuration" the following actions are being implemented prior to realigning the Turbine Building ventilation:

A temporary vestibule inside the security door at the north wall of the turbine building has been constructed. This vestibule encloses the push-button that operates the roll up door and the padlock which prevents the door chain mechanism from moving. This vestibule enables Security, upon request from the control room, to unlock and quickly open the roll up door within 5 minutes after notification (or 10 minutes elapsed time from the assumed break) , without being exposed to the steam environment.

A second vent path has been provided in the event that the roll up door cannot be opened. This will consist of hinged sections over the Turbine Building east wall louvers that can be easily and quickly opened from the outside. The existing movable dampers inside the fixed louvers are being administratively controlled open.

At least half (4 banks) of Turbine Building roof Louvers are also administratively controlled open.

The above modifications and actions were assumed to be in place in the analysis of the winter environmental service conditions.

Components Identified in Turbine Building potentially affected by HELB

The SSCs identified in the Turbine Building and potentially affected by the environments calculated include:

(1) PCCW/SCCW pump motors P9A/B and 10A/B, cabling and pressure switches (El 21' 0"),

(2) Service Water Pump cabling (El 21' 0")

(3) Control Room (CR) fans, Air Conditioning Units ACU 1A/B, associated controls and cabling, CR supply and return ductwork and cable tray room supply ductwork (El 39' 0") and components located in the control room.

(4) Protected Switchgear Room fans FN 31 and 32, associated controls and cabling (El 39' 0"), Protected Switchgear supply and return ductwork and cable tray return ductwork and components located in the Protected Switchgear Room and cable tray room.

(5) PCCW Heat Exchanger Bypass controls

(6) Feedwater isolation and bypass valve controls 39' 0"

Items (1), (2), (5) and (6) were reviewed as part of the summer conditions evaluations performed previously. The service conditions identified for winter conditions, although more severe than summer conditions, remain within the operational capabilities of the motors and cables in the review.

Item (3) was also evaluated previously. The environmental service condition is driven by internal heat loads. These loads remain the same for both summer condition and winter conditions. However, lower initial ambient temperatures during winter conditions exist. Consequently, the maximum temperatures experienced after a loss of ventilation are found to be acceptable prior to the initiation of temporary ventilation.

With respect to Item (4), the change from summer to winter condition consists of revoking the temporary change which locks the ventilation system in the once-through mode and prevents automatic switch over to the recirculation mode. The normal set point for this switch over is 76 degrees inside temperature as measured in the protected switchgear room exhaust duct. The high temperature alarm setpoint will be lowered to assure that bulk average room temperature is no higher than the 85°f assumed in the analysis. A temperature rise evaluation based on room heat loads concludes that it will take more than an hour in the recirculation mode to exceed 125 degrees. This is sufficient time to initiate temporary action after a HELB.

In the recirculation ventilation mode, one failure scenario resulting from a HELB creates a slight negative pressure in the switchgear room which could result in steam in-leakage from the adjacent Turbine Building. A manual trip of the exhaust fan from the control room and the relatively well-sealed openings limits the in-leakage of steam. Considering the air volume in the room the extra heat and moisture introduced into the room during the short interval of the HELB are judged not to have a significant impact on the equipment or the room heat up time.

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Consideration of Permanent Modifications to mitigate Turbine Building HELB

Maine Yankee is evaluating several design changes which would reduce the reliance on operator action to mitigate the effects of a License Basis HELB. These include the following:

We are considering automating the existing manual louvers on the East wall of the 21' 0" elevation of the turbine building. We are also evaluating the redesign of the switchgear room ventilation system which would relocate critical fans and ductwork from the turbine building environment to a new roof structure above the Service Building.

Maine Yankee is considering a modification which will enable remote manual switching from the control room of the emergency diesel cooling from the PCCW/SCCW system to the fire water system. This realignment presently requires local valve manipulation. If this modification is feasible, operation of the PCCW/SCCW system would not be required to mitigate the effects of a HELB.

Conclusions

Upon completion of the temporary modifications previously described, Maine Yankee is confident that we can mitigate the effects of license basis HELB in the Turbine Building during Winter ventilation configurations. We will perform the ventilation realignment after installation of the modifications and as weather demands. Next May we anticipate reverting to the temporary "summer configuration" until the fall refueling outage during which we plan to install the permanent modifications.

Sincerely,

James R. Hebert

James R Hebert, Manager
Licensing and Engineering Support

c: Mr. Hubert Miller
Mr. J. T. Yerokun
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Mr. Patrick Dostie
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