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LTR-NRC-17-9

February 1, 2017

Subject: Errata for WCAP-8354-P-A (Proprietary) and WCAP-8355-A (Non-Proprietary), "Long Term Ice Condenser Containment Code – LOTIC Code"

The Westinghouse LOCA M&E containment response methodology for ice condensers described in WCAP-8354-P-A and WCAP-8355-A (Reference 1) was approved in 1976. This methodology has been used to analyze containment responses for most of the ice condenser plants. As a result of ongoing code maintenance at Westinghouse, a discrepancy between the methodology and its implementation in the source code was discovered. The purpose of this memorandum is to notify you of our discovery and conclusions of our investigation, and supply a changed page for the topical report.

Section 5.2, page 5.2-6 of WCAP-8354 contains the following statement, "If the expanding volume occupies the lower compartment, the pressure calculation then includes the lower compartment conditions." A source code inspection revealed that the lower compartment conditions are not included until the end of the depressurization period. It has been determined that the affected portion of the transient is very short, and including the lower compartment conditions in the calculation would have a negligible impact on calculated containment conditions. Code updates regarding this issue would provide no improved transient behavior or influence on the limiting time of the event nor increase in nuclear safety. Accordingly, for your information, please find attached an errata page to WCAP-8354-P-A and WCAP-8355-A which resolves this inconsistency.

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Attachments

cc:
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(1 page attached)

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The known masses and specific enthalpies in the expanding volume enable determination of the total enthalpy for the volume.

and ice-empty part of the ice compartment

For the calculation of the temperature in the upper compartment, the same method as in the first part of this period is employed, taking into account the recirculation fan flow rate out of this compartment.

If the expanding volume is smaller than the lower compartment volume, the system pressure calculation is based on the upper compartment and the ice-filled part of the ice compartment.

~~If the expanding volume occupies the lower compartment, the pressure calculation then includes the lower compartment conditions.~~

If the expanding volume fills the lower compartment and the ice-empty part of the ice compartment, this calculation period is terminated.

During the second period, the ice inventory calculations are identical to those of the first period, as are the containment control volume mass distribution calculations. The latter calculation takes the diminishing steam-filled volume of the lower compartment into account.

The dead-ended volume of the lower compartment is treated as follows. In case it is a part of the upper compartment, no calculations are necessary.

When assigned to the lower compartment, and acting independently, the volume of the initial air in this compartment is calculated, assuming it is at the upper-compartment temperature with saturated steam in it. If a purge rate from the dead-ended volume is specified, the purging of the dead-ended volume starts with the start of the circulation fan, and the purge rate is added to the circulation fan flow. The decreasing dead-ended volume is thus calculated by Equation 27 with the same assumptions as mentioned above. The decrease of this volume is added to the lower compartment volume and the dead-ended volume becomes an integral part of the lower compartment.