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May 1, 2015

Cindy Bladey,
Office of Administration
Mail Stop: OWFN-12-H08
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

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Subject: Comments on Draft NUREG-2174, "Impact of Variation in Environmental Conditions on the Thermal Performance of Dry Storage Casks,"
Docket ID NRC-2014-0273

Dear Ms. Bladey:

Holtec International appreciates the opportunity to present comments on draft NUREG-2174. Specifically, Holtec is providing comments on the Federal Register Notice published on February 24, 2015, under Docket ID NRC-2014-0273.

Holtec appreciates the significant work in preparing the draft NUREG, and would like to offer the following comments for consideration:

1. Table B-1 reports the flow resistance factors used in ANSYS FLUENT model for HI-STORM 100 and HI-STORM 100U. The text indicates that these values are calculated from NUREG-2152; however, based on a review of NUREG-2152, it is observed that the flow resistance values reported therein are not consistent with those presented in this proposed draft report (NUREG-2174). It is therefore unclear how these values were calculated.
2. The evaluations in the draft NUREG considered variations in the normal ambient temperature in the range of 80°F to 120°F. It is stated that this range seems to envelope the natural variation of ambient temperature during the hot season. It is recommended in the report that seasonally averaged values of ambient temperature are the most appropriate values to be used for normal condition analysis – both for maximum and minimum temperatures.

The fuel cladding temperature limit per the ISG-11, Rev. 3 for normal long-term storage is 752°F, which is primarily based on creep behavior of fuel over a long period of time. If the average ambient temperature for a short duration (couple of months in the hot season in United States) is slightly higher than 80°F, it will result in a slightly higher fuel cladding temperature for an extremely short duration. However, this does not cause a significant increase in fuel cladding creep. All the thermal analyses have

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inherent conservatisms which render conservative peak cladding temperatures. Based on currently loaded canisters, the actual heat load in a canister is always less than the licensing basis heat loads, providing additional margins to PCT limit. Moreover, the heat load of a system reduces with time thereby nullifying the effect of ambient temperature for short durations.

Most of the thermal analyses performed on dry storage cask systems are based on steady state conditions assuming that all the boundary conditions in the analyses remain constant for a long time. In fact, there are changes in the ambient temperature during a span of 24 hours, let alone 7 days, which is approximately the time it takes for a typical dry storage system to reach steady state.

Based on all the above facts, it seems more reasonable to consider a yearly average temperature of 80°F, which bounds all sites in the United States.

3. Is the intent that the draft NUREG's proposed ambient temperature of 120°F the average of temperatures during days and nights for the duration of the time considered? Ambient temperature data suggests that using 120°F for a day and night average over an entire month itself is very high for locations in the United States.
4. The effect of elevation on the thermal performance of a dry storage cask system is evaluated and presented in Section 4.8.4 of the draft report. It is a known fact that the ambient temperature decreases due to an increase in elevation. It is not evident from the report if the analysis to evaluate the effect of elevation also includes this consideration. If the reduction in ambient temperature has not been included, then it aggravates the effect of elevation. Therefore, it must be clarified in the report whether change in ambient temperature is considered or not and also that this effect may be considered when evaluating the effect of elevation.
5. The report finds that an increase of the air temperature by 10°F results in an increase of the peak cladding temperature (PCT) by 14°F (Table 4-19 of the draft report) i.e. the cladding temperature increases more than the increase in ambient temperature. The reason for this observation should be clarified in the draft report (for example: are there computational uncertainties that may have resulted in this increase?).

If you have any questions, please contact me at (856)-797-0900 ext. 3951.



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Sincerely,

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