

Email to Donna Gilmore on February 15, 2018.

Questions and answers regarding the thermal analyses on the UMAX storage system

- 1) *Q: Actually, the UMAX dry storage system CoC states the test is required for 30kw or higher.*

A: There is no Condition in Certificate of Compliance (CoC) 1040 that requires a user to perform a test to validate the thermal model.

- 2) *Q: I understand SCE plans to load canisters very close to 30kw. Higher than most or all previous heat load levels used in any system.*

A: Since there is no condition in the CoC, SCE could load the casks as high as is it permitted in the CoC. HI-STORM UMAX Technical Specifications (TS) Appendix B provides the different loading configurations and allowable limits permitted per configuration with a maximum total heat load of about 37 kW.

- 3) *Q: How does the NRC verify that proper canister and heat loading is done?*

A: The NRC conducts inspections and participates in dry runs and observe most loadings to verify the casks are loaded according to Technical Specifications (TS). This includes verification of heat load and compliance with TS. The NRC verifies that proper loading of the canister and heat loading are done by either direct observation or review of selected records such as procedures that govern the selection and verification of fuel assemblies prior to each loading.

- 4) *Q: Given that Holtec and PG&E loaded over half the fuel assemblies incorrectly at Diablo Canyon, I don't have much confidence and am hoping the NRC plans to personally verify correct loading and heat levels.*

A: The NRC conducts the technical review based on the maximum design values. It is the user responsibility to verify that head load values are appropriately calculated to comply with the TS. The inspectors generally observe and review licensees identification of each fuel assembly placed in the ISFSI, list the parameters and characteristics of each fuel assembly, and maintain a record of each fuel assembly as a controlled document.

- 5) *Q: Why wasn't a thermal validation test required for the UMAX system? This is a different vent system design than those other above ground designs you referenced below.*

A: The UMAX underground system is not very different in its thermal-hydraulic characteristics compared to above ground designs. The UMAX underground design cooling capabilities are affected by low speed wind, which is considered in the analysis. The cask was de-rated to 80% of the total heat load originally requested by the applicant to provide additional margin because of the lack of validation of the thermal model and small margin in the calculated thermal results.

- 6) *Q: With the UMAX system being a new system design and one that doesn't even match the approved NRC CoC requirements, we are very concerned about this unproven system.*

A: The changes to the UMAX system at SONGS were performed by the CoC holder under 10 CFR 72.48 process on which NRC has performed an inspection.

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- 7) *Q: SCE says their MPC-37 thin-wall canisters will be 5/8" thick. The NRC approved only 1/2" thick canisters. Won't that affect the thermal conditions and possibly other variables that the NRC staff normally reviews? Will this review occur before fuel begins loading (projected to occur in December 2017).*

A: The change in UMAX canister wall thickness was performed by the CoC holder under 10 CFR 72.48 process on which NRC has performed an inspection. An increase in the cask thickness from 1/2" to 5/8" will have a negligible or minimal impact in thermal performance of the cask because of the negligible thermal resistance added by the increased thickness.

- 8) *Q: The concrete base is only half below ground. NRC approved a fully below ground system with only the lids and pad above ground. This is another variable that could affect system performance thermally and structurally in a high risk earthquake zone.*

A: The changes to the UMAX system at SONGS were performed by the CoC holder under their 10 CFR 72.48 process and evaluated under the requirements of 10 CFR 72.2129b) in which the NRC is currently conducting an inspection. The thermal-hydraulic characteristics of an above ground cask design and a partially or fully below ground cask design are not significant, except for low speed wind effect on a below ground design which has been considered in the thermal analysis. Therefore, the thermal performance will not be affected. The portion of the UMAX system that is not below ground level is surrounded up to the height of the pad by compacted fill that slopes away from the pad to ground level. The soil-structure analysis shows that this modification increases the seismic response at the top of the pad by no more than 10%, which results in minimal impact on the structural performance of the UMAX system.

- 9) *Q: Also, the ground is always soggy at the site. Would that be a site specific condition the NRC is evaluating before approving the ISFSI site license?*

A: Every licensee using an NRC approved dry cask storage system listed in 10 CFR 72.214 is required to perform an evaluation to show that for the conditions at the ISFSI location, the dry cask storage system(s) selected will meet all of the applicable requirements. This evaluation, described in Chapter 10 of the *Code of Federal Regulations* (10 CFR) 72.212, "Conditions of general license issued under § 72.210," requires the licensee to consider, among other things, site parameters for the ISFSI location. The NRC inspects the 10 CFR 72.212 evaluation as part of ISFSI inspection activities.