Innovative Methods for Interrogation of DSC Internal Conditions

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ABSTRACT:

The goal of this investigation is to study innovative methods for interrogation of the Dry Storage Cask (DSC) internal conditions to assure that the design safety functions of the DSCs continue to be met during extended storage and after transportation. The proposed work takes a two-pronged approach. The team will study techniques involving only external sensors and equipment, which could be deployed on existing DSCs. In addition, small sensors located inside the canister that can be externally powered and read through the canister wall will also be investigated. Such sensors can be implemented on future DSCs providing capabilities to monitor internal conditions that are otherwise challenging to assess solely with external sensors. It is worthwhile highlighting that the sensor systems to be developed in this project can be implemented on both vertical and horizontal DSCs.

With the Yucca Mountain project on hold, nuclear power plants in the US have resorted to on-site storage with DSCs. While the service time of the existing DSCs will likely be extended, new canisters are being developed with additional safety features. The NRC has identified key safety functions for DSCs, which have to be met during extended storage and after transportation. This proposed work is to develop innovative interrogation techniques for periodic measurements and inspection of DSC internal conditions.