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Impact of Variation in Environmental Conditions on the Thermal Performance of Dry Storage Casks

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**Comment On:** NRC-2014-0273-0001

Impact of Variation in Environmental Conditions on the Thermal Performance of Dry Storage Casks

**Document:** NRC-2014-0273-DRAFT-0009

Comment on FR Doc # 2015-05098

## Submitter Information

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## General Comment

Please see attached document.

## Attachments

COPS COMMENTS ON NUREG 2174 - "Impact of Variation in Environmental Conditions on the Thermal Performance of Dry Storage Casks"

SUNSI Review Complete

Template = ADM - 013

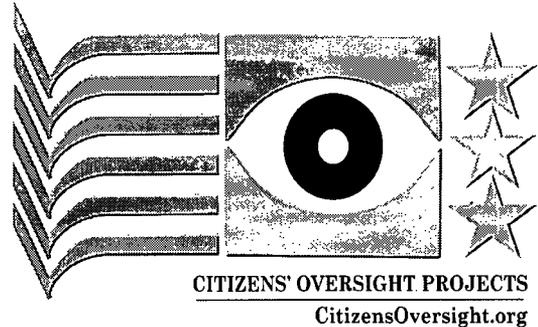
E-RIDS= ADM -03

Add= *George Jolic (JXS5)*

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May 4, 2015



**COMMENTS ON NUREG 2174 - "Impact of Variation in Environmental Conditions on the Thermal Performance of Dry Storage Casks"**

Conclusions of this document only made comments regarding out PCT (peak cladding temperature) changes with regard to environmental conditions, but did not go on to say what are the limiting conditions where each configuration was found to be always within operational limits. Thus **THE EXPECTED FINAL CONCLUSIONS IN THIS DOCUMENT ARE MISSING!**

For example, considering worst case environmental conditions, i.e. 120 degrees F, reasonable high altitude (say 1000 ft elevation), 0 percent RH, 5 mph wind, do the various dry cask configurations perform adequately given a range of heat source levels (such as a mixture of 25% high burn up fuel and 75% standard fuel, after being stored in a fuel pool for the minimum time, say five years.)

Thus, given worst case conditions, we need to ask: **DO THE DRY CASK SYSTEMS KEEP PCT BELOW CRITICAL LEVELS?**

This sort of final conclusions are missing from the document.

WE MUST DETERMINE if these systems are right on the bitter edge of functioning, or if there is adequate margin in the operational thermal dissipation design. The detailed analysis is of little use if the system has decent margin, and if it does not have decent margin, then the designs need to serious design review. These systems should not be only barely within margin!

What worries me is that these dry cask systems have apparently been designed without reviewing the worst-case environmental conditions.

You also decided without any rationale to disregard solar heating of the dry cask systems. This could have serious impact particularly in the UMAX (underground design) if placed in a desert region with intense solar heating of metallic components on the surface. It seems this parameter cannot be disregarded UNLESS there is plenty of margin in the overall calculation, which was missing, as stated.

The vertical configuration (Holtec UMAX) could be seriously impacted by the intrusion of water into the bottom of the well, thereby not allowing air currents to flow down and then turn around the bottom and the up and out. A small amount of water, say as little as 12 inches in the bottom of the well could seal off air flow.

Thus, the worst case calculations should include what will happen not just if there is a slight wind, but if there is a flash flood where water intrudes into the well and seals airflow completely. Then, we need to know how much time do we have to pump the water out of the well and re-establish air flow.

Is it necessary to shield canisters from the wind? not answered.

Is it necessary to provide shade over the structures from the sun if placed in the desert? not answered.

Are there places in the country which have temps too high and humidity too low such that these will not work?

The Palo Verde plant west of Phoenix AZ is in a desert region and temperatures are frequently well over 100 degrees F, and very dry. Will the designs reviewed operate with adequate margin in those conditions? Not answered.

**CONCLUSION:**

Although this paper did provide useful information, it is a long way from being useful, particularly by the general public. The primary question is not asked or answered: Do these dry cask systems provide adequate margin for heat dissipation even in worst case conditions?

Sincerely,

A handwritten signature in black ink, appearing to read 'Ray Lutz', with a long horizontal line extending to the right.

Raymond Lutz  
National Coordinator, Citizens' Oversight Projects