Radioactive Waste Management Associates

Memo

To: Steve Ruffin, Acting Chief, Spent Fuel Licensing Branch

From: Marvin Resnikoff

cc: T Clements, HEUNL Group

Date: January 21, 2016

Re: NAC-LWT CoC

I reviewed the application of NAC International for a Certificate of Compliance (CoC) No. 9225 for the NAC-LWT as it pertains to liquid HEUNL from the Chalk River facility. My particular concern is with the thermal aspects since previous reports[1] by the Department of Energy show thermal failure thresholds within 15 to 30 minutes under a fire accident at 1850 °F. This is the potential fire temperature of diesel fuel. Though previous studies did pertain to water-filled casks, the casks were assumed to contain heat-generating nuclear fuel and were subjected to temperatures above the regulatory limits. These conditions do not apply to the NAC-LWT containing HEUNL under regulatory (not real-life) conditions. Nevertheless, I attempted to review the NAC-LWT Safety Analysis Report (SAR), Rev. 44, dated August 2015.

As you are probably aware, it is not possible for the public to independently evaluate the thermal analysis in the NAC-LWT SAR. First, all thermal calculations are redacted, and 70 pages of drawings are redacted for proprietary reasons. It is reasonable that design drawings of the HEUNL containers are redacted for proprietary reasons, but it unreasonable to redact the thermal calculations. The thermal calculations should be equations or software (Heat5) and assumed inputs by NAC, this should be available to the public, unless the NRC and NAC have something to hide.

The cask diagram, as shown in other NAC publications, indicate a possible error in NAC assumptions, though without additional thermal information it is impossible to know. The radial steel bars that hold each shell, appear to be missing. These steel radial bars are a conduit for heat to enter the cask in a fire accident. The diagrams show an outer neutron shield 0.24 inch, within which is a 5 inch torus of liquid neutron absorbing material, within which is a 1.2 inch steel shell. The outer neutron shell must be held by radial steel bars to inner steel shell; this is the case with other casks we have reviewed. Within the outer 1.2 inch shell is 5.75 inches of gamma absorbing lead. With other casks we have reviewed, this lead shield also has radial steel bars attached to the inner 0.75 inch shell. All these radial steel bars are heat conduits in an accident involving a fire.

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[1] Elder, HK, et al, "An Assessment of the Risk of Transporting Spent Nuclear Fuel by Truck," Pacific Northwest Laboratory, PNL-2588, November 1978, p. 6-6.