

Technical Memo TM-145

Prepared By: Steven Soler
To: Holtec Corporate Engineering, Holtec Users Group, USNRC Division of Spent Fuel Management
Date of issue: April 1, 2015
Subject: Holtec Response to NRC Information Notice 2015-03: *Improper Operation of Spent Fuel Transfer Cask Neutron Shield Equipment Leading to Elevated Radiation Levels Adjacent to Spent Fuel Transfer Cask*

As discussed in the recently issued NRC notice 2015-03, there have been two past industry events involving another cask vendor's transfer cask where the water jacket, which is intended to serve as a neutron shield during cask processing activities, did not provide shielding as intended due to human performance issues in the field. In one case, the water jacket was inadvertently partially drained when a crew member mistook the water jacket drain connection for the annulus region drain line. In the other case, the crew incorrectly assumed that the water jacket had been filled when, in fact, it had not due to blockage in the line from the fill tank.

It is important for users of the Holtec cask system to understand these events and take steps to avert a similar event using the Holtec system.

First, it is important to note that, unlike the other vendor's system, the neutron shield water jacket in the HI-TRAC is direct filled via a hose placed in the top water jacket port or at the openings in the water jacket where the large safety relief valves are mounted. This direct fill process provides for a process to fill the water jacket that does not allow for any intermediate conditions that could interrupt the fill process as well as provide for a direct visual confirmation of a successful filling of the HI-TRAC water jacket. For these reasons, Holtec does not consider the conditions that led to the issue at Susquehanna to be applicable to the Holtec system.

With regard to the human performance events that led to the partial draining of the water jacket at Cooper Station, it is deemed possible that a similar human performance event could take place with the Holtec system if proper controls are not in place to prevent such an occurrence. It is noted that there are two separate design details that are integral to the HITRAC transfer cask; the annulus region and the water jacket, both spaces that are always water filled, but in some cases, require draining and refilling during loading operations.

For most users of Holtec systems, the HI-TRAC water jacket is filled or confirmed filled prior to a campaign start and does **not** require any adjustment during the campaign. However, some users are required to drain and fill the HI-TRAC water jacket repeatedly during the campaign due to crane capacity limitations. With respect to the annulus region, it is common practice to fill and drain this region for each cask. For those users that are required to drain and fill both regions, the potential for a human performance error are higher than those who do not drain their water jacket. However, all users of the Holtec system are susceptible to a human performance event similar to the COOPER event. In order to prevent this event from happening with a Holtec cask system, Holtec advises that all users provide adequate labeling of the two respective drain port

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locations to clearly and properly identify the ports and their function as well as the specific hoses that are dedicated to each port. Additionally, Holtec recommends that users install different fittings on the two HI-TRAC ports and the respective hoses that are used to connect to them in order to prevent the inadvertent connection of a hose to the wrong drain port location. Finally, it is recommended that the OE detailed in NRC notice 2015-03 is included in all applicable pre-job briefs to ensure that the working crew is fully cognizant of the past issues and the barriers that have been put in place to prevent recurrence.