Providing Additional Pressure Relief to the Remediated Nitrate Salt Drums

Background

After the radiological event on February 14, 2014 at the Waste Isolation Pilot Plant (WIPP), Department of Energy (DOE) scientists from several national laboratories conducted extensive experiments and modeling studies to determine what caused the drum to breach. These investigations indicated that an incompatible mixture of nitrate salts and an organic absorbent created the conditions that resulted in an exothermic reaction that led to a drum breach and radiological release. As part of this research, two additional parameters were determined to be critical to control an unwanted reaction: temperature and pressure.

The information gained from the scientific experiments and associated research have helped DOE and Los Alamos National Security, LLC (LANS) to develop robust measures for the safe storage of the remediated nitrate salt (RNS) drums located at Los Alamos National Laboratory.

In the time since the WIPP event, comprehensive measures have been employed to ensure the RNS drums remain at a safe temperature. Additionally, in the summer of 2015, LANS installed a supplemental cooling system in the contamination-control structure where the RNS drums are stored. The temperature of the RNS drums are monitored and inspections are conducted daily.

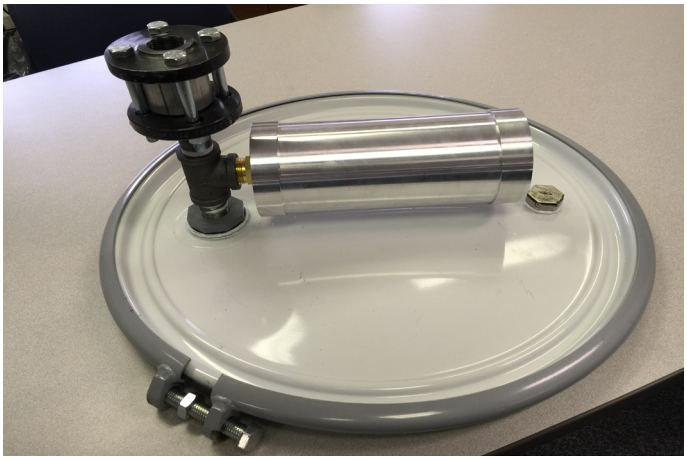
Additional Pressure Relief

To reduce the possibility of a build up of pressure, each of the RNS drums is equipped with a filtered drum vent. To further reduce the potential for pressure to contribute to an exothermic chemical reaction, in the spring of 2016 the Laboratory will install High Efficiency Particulate Air (HEPA) filtration systems to the RNS drums.

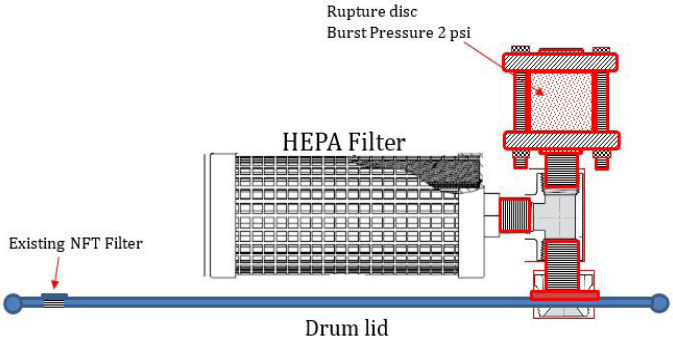
The HEPA filter will eliminate any pressure build-up within the drum. In the unlikely event that the filter becomes clogged, a pressure relief disc will operate to release the pressure.

By eliminating the potential for pressure build-up, the possibility of a runaway reaction is removed. DOE and LANS are confident that this additional layer of defense for the RNS drums will prevent an unintended radiological release similar to what occurred at WIPP.

The RNS waste is stored in drums like the ones pictured above.



A HEPA filtration system will be installed on the RNS drums.



Pressure build-up would be relieved by the HEPA filtration system.

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