SAND2007-0231P

Generation of Environmental Conditions Anticipated within the Thermal Pulse

Presented to: GECRD, Schenectady, NY

January 17th, 2007

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Not LSN Relevant

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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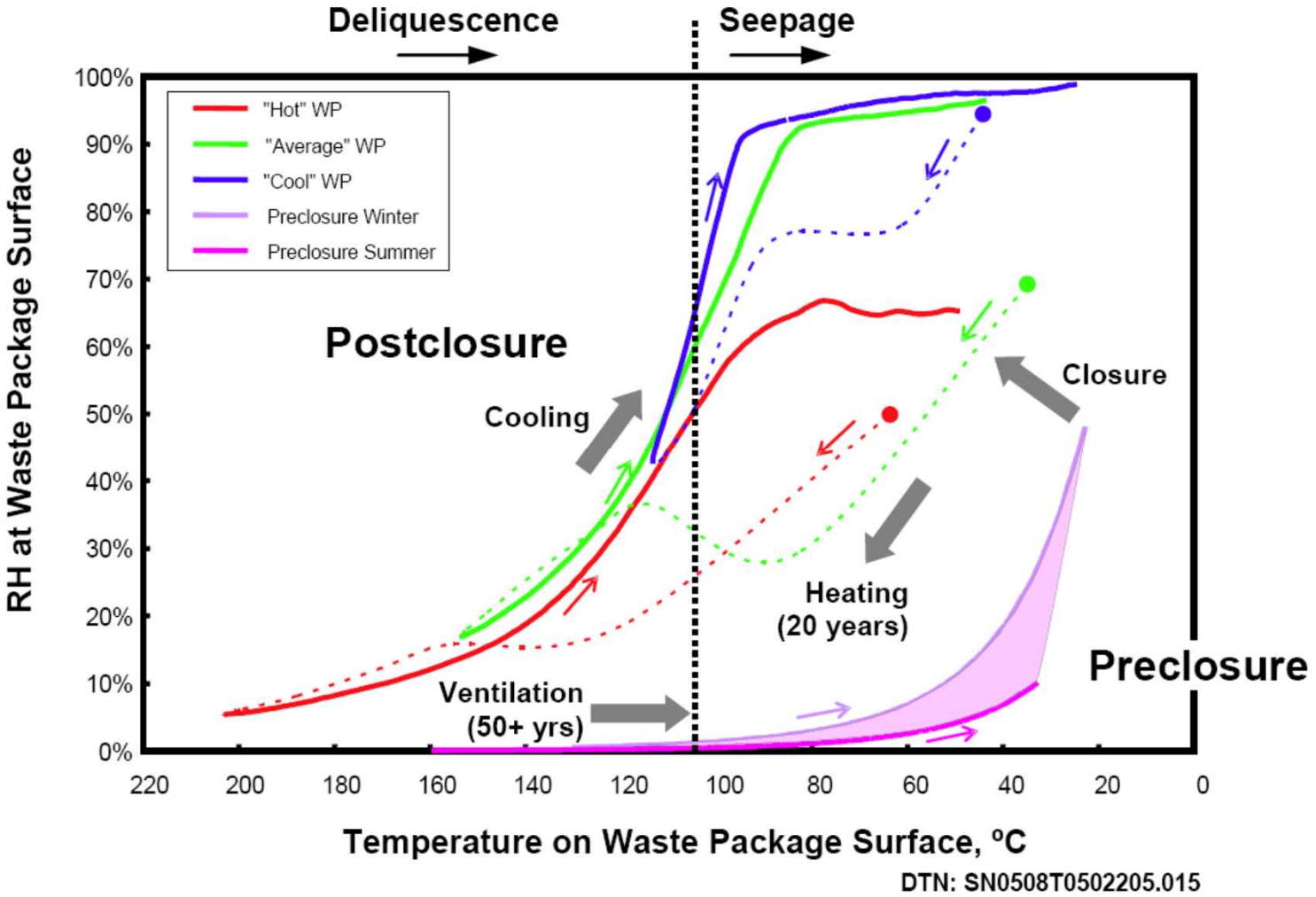
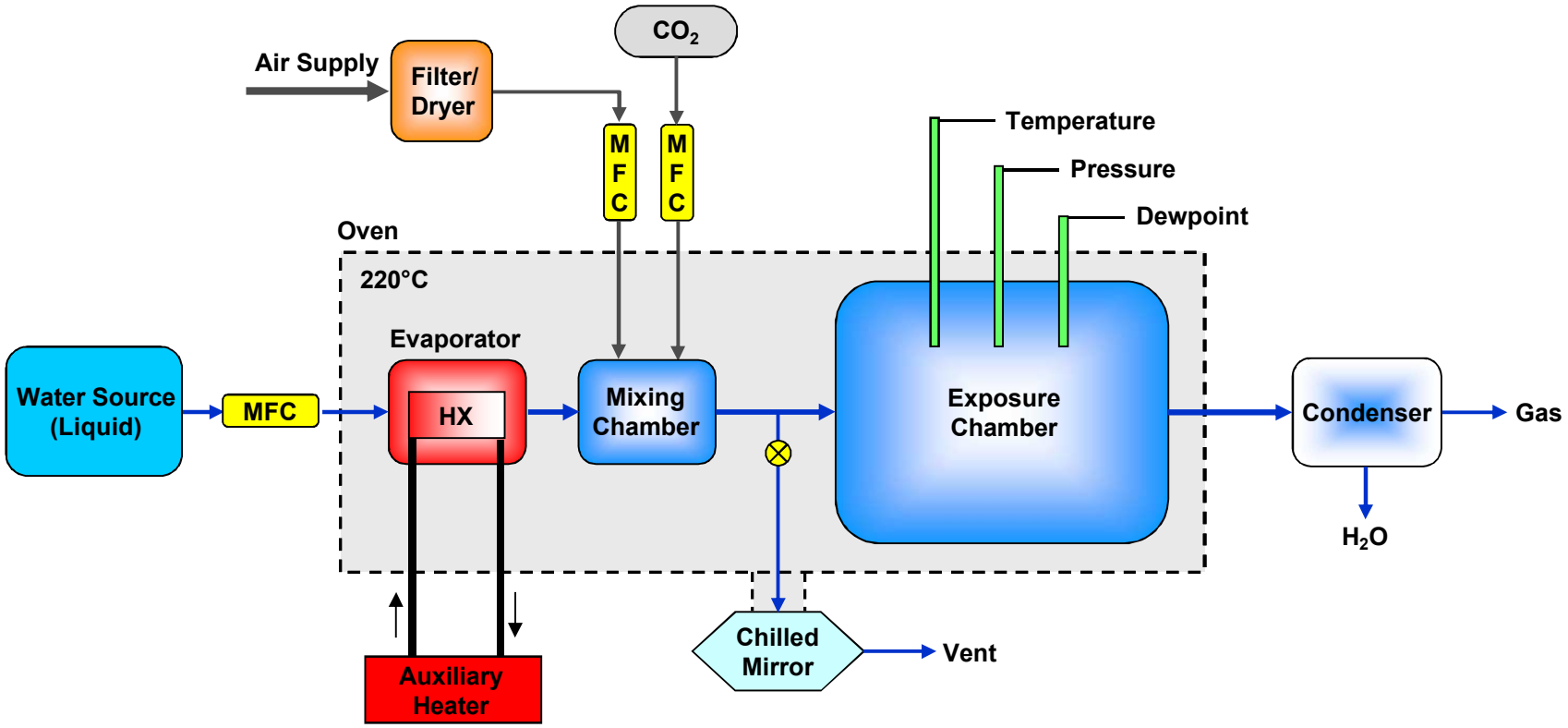
Post-Closure Waste Package Surface Temperature



Generation of a High Dewpoint Environment (95°C+) at Atmospheric Pressure

- Schematic of High-T, controlled moisture content system



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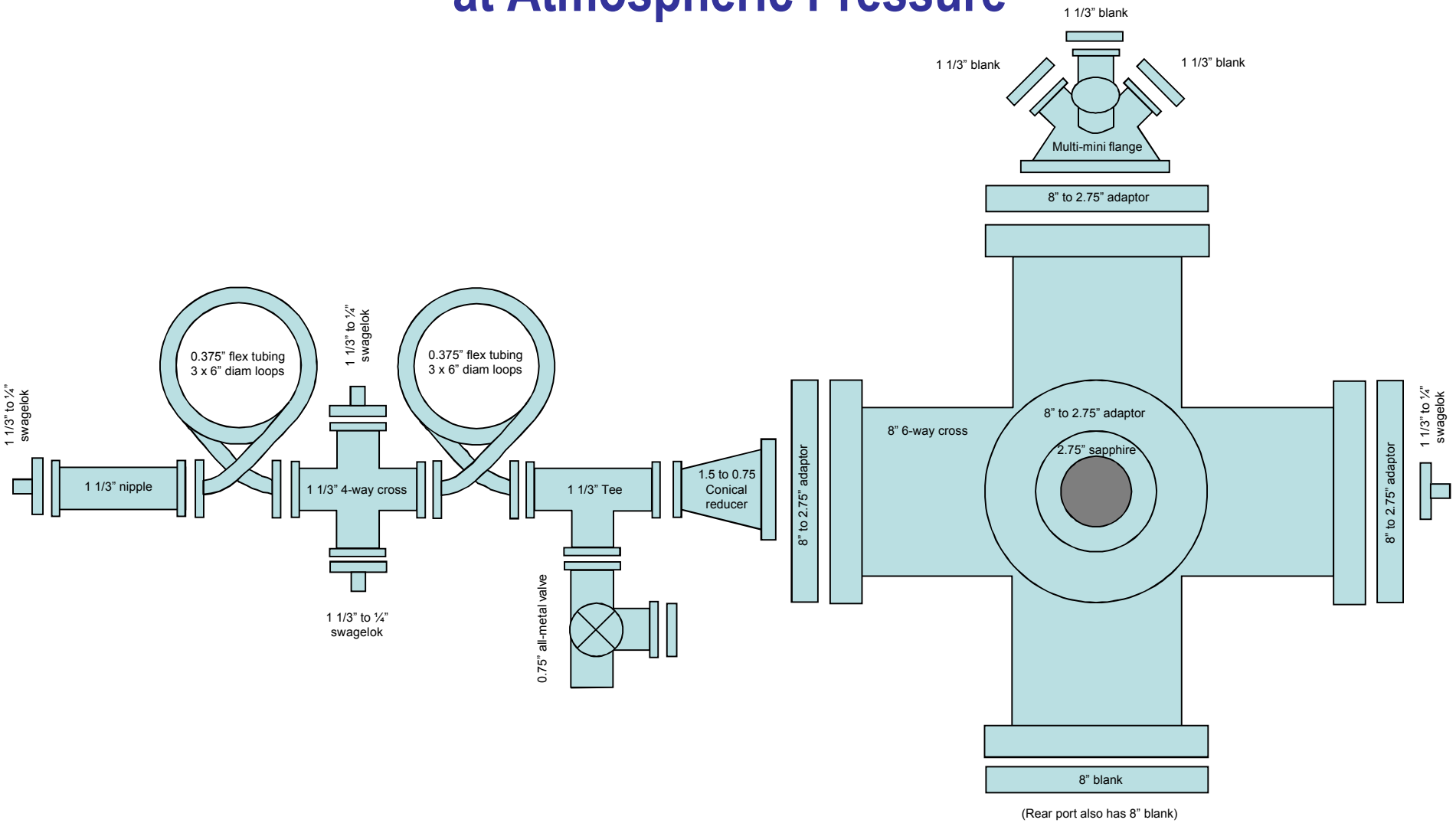

Quantitative Assessment of Corrosion Stifling Process via Resistance Measurements

Goal: Establish if localized corrosion of Alloy 22, once initiated due to a limited quantity of contaminant, will stifle with time due to the consumption (including physical sequestration) of the aggressive component

- Four-point resistance measurements, analogous to DCPD, will be employed to measure small changes in material oxidation under atmospheric conditions

- The resistance change in the wires is monitored until the rate of change approaches zero, indicating corrosion shutoff.

Propagation and Stifling Processes for Localized Corrosion under Dust Deliquescence Conditions

Goal: Understand the kinetics of the crevice corrosion process for atmospherically exposed samples under YMP relevant conditions

- Fine pitch, segmented electrodes will be used to simulate a bulk (continuous) material (electrodes will employ either a stacked plate/foil arrangement or an array of fine wires)
- The occluded geometry will be formed via a traditional MCA, allowing electrodes within and just outside the crevice to be accessed electrically.
- Crevice corrosion will be initiated electrically, and the kinetics of the corrosion and repassivation/stifling processes within the crevice monitored. An effort will be made to link repassivation kinetics to the type and concentration of contaminants present

Summary

- System being assembled
- Goals – evaluate crevice corrosion susceptibility of WPOB materials under post-closure relevant conditions