



THE HANFORD SITE

Direct-Feed Low-Activity Waste / Melter 1 Heatup Update

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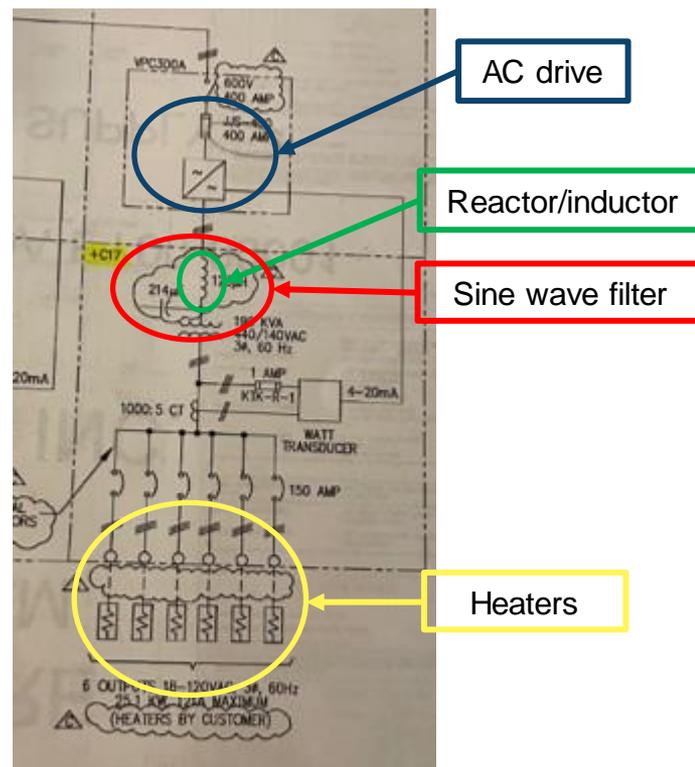
January 18, 2023

Startup Heater Power Supply Filter

- During LAW Melter 1 heatup (approx. 300 degrees F), the line filters in the three power supplies overheated
- The filters in all three cabinets showed thermal damage



Damaged startup heater inductor



The line reactors/inductors in the new filter are designed to handle sustained high-frequency noise (harmonics), particularly at low power levels as identified by modeling

- Different steel in the core to reduce heat generation
- Approximately 2.5 times heavier, requiring more energy to heat to a point of damage
- Separate cooling fan with substantial open space for heat dissipation
- Subsequent load testing in December across heatup power spectrum was successful and supports use during Melter 1 heatup

New sine wave cabinets



Extent of Condition from the Startup Heater Power Supply Failure

As part of the causal analysis from the condition, the project performed modeling of similar systems to evaluate whether this low-power harmonics issue could be present

- Discharge heater power supply inspection and modeling indicates these power supplies will operate adequately
- Joule heater power supply modeling has identified the need for additional testing prior to Melter 1 heatup, as follows:
 - Receive load bank to test in early January
 - Establish contract to replace line filter core
 - Establish contract to procure alternate line filter

Joule Heater Input Transformer Pictures



Water cooling on secondary side of transformer

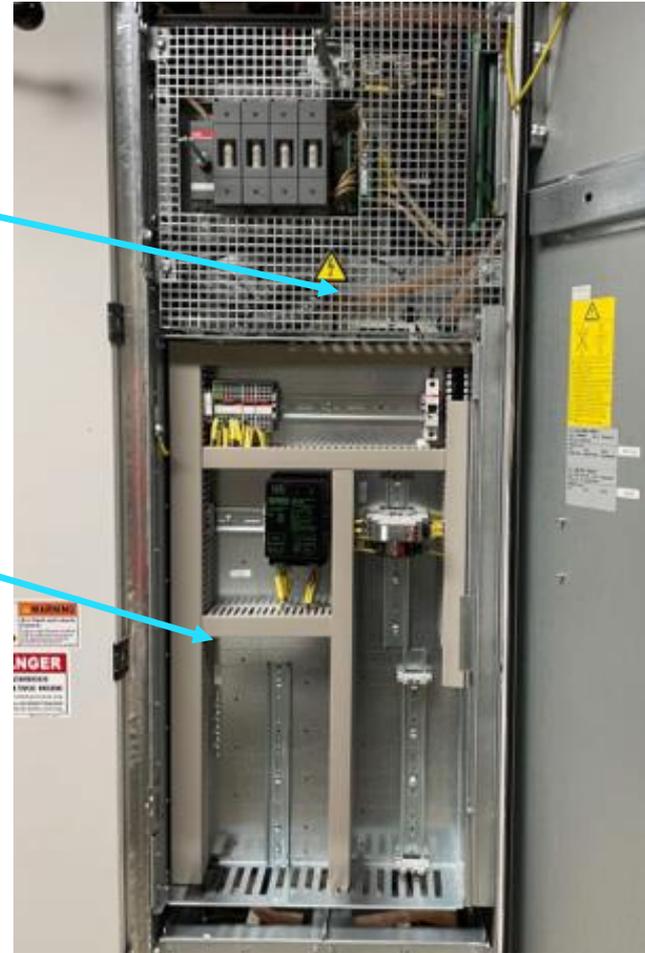


Joule Heater Alternating Current (AC) Drive Pictures

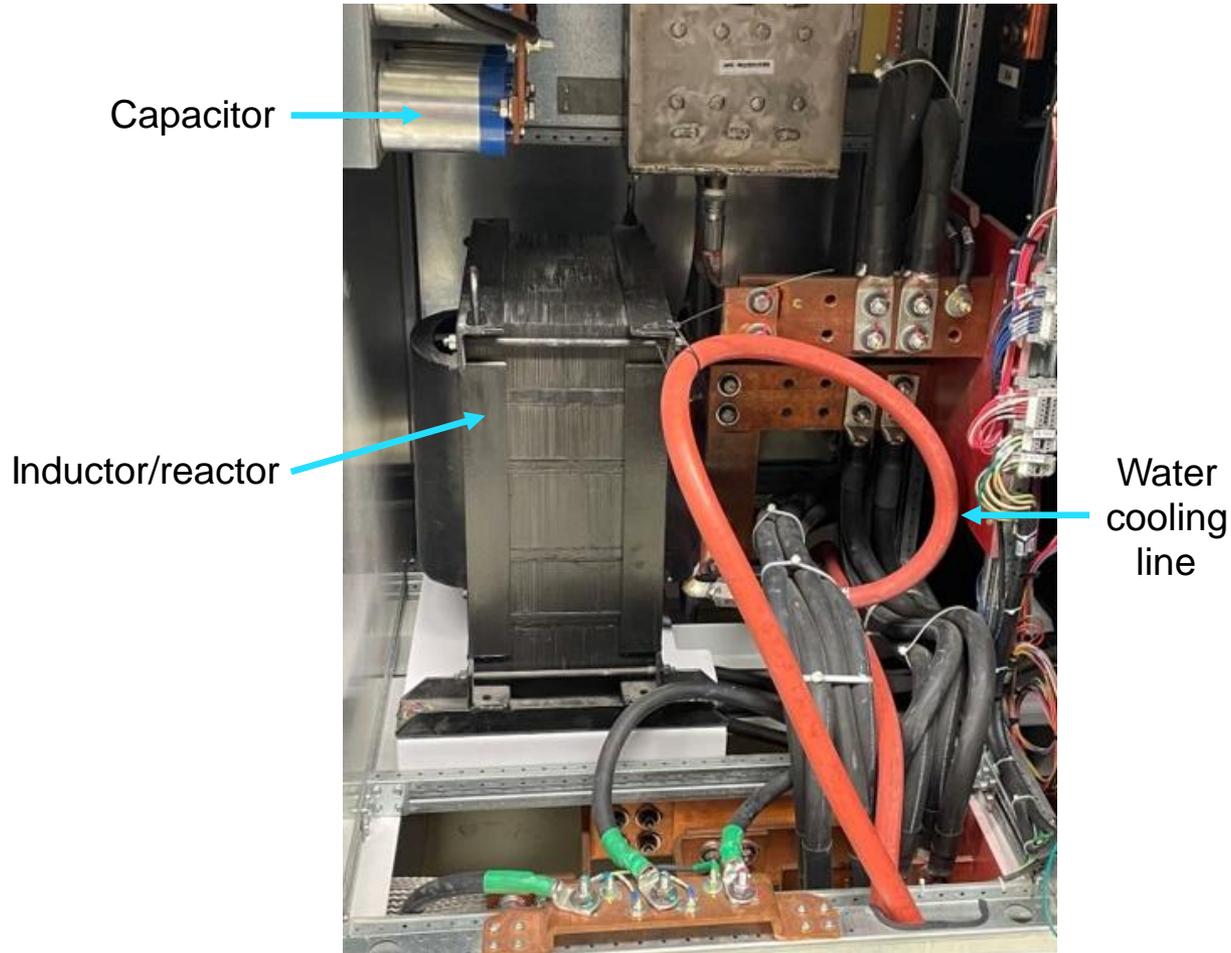


Water cooling lines

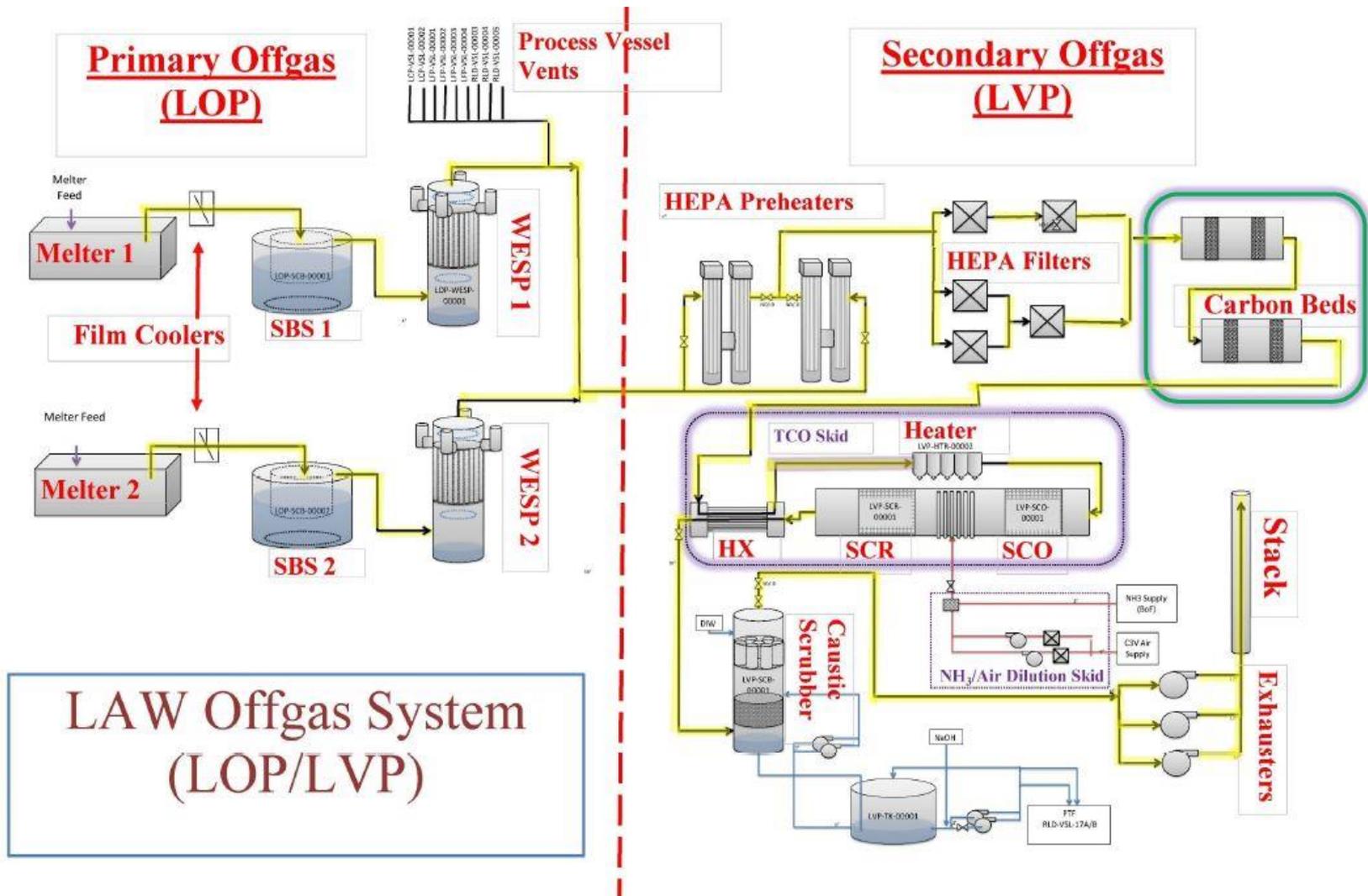
AC drives behind



Joule Heater Alternating Current Drive Filter Assembly



Offgas System Overview



Unexpected levels of water accumulation were identified during Melter 1 heatup. System was drained and evaluated, and plan was created to mitigate and evaluate effectiveness of changes.

- Install additional low-point drain connections – Complete
- Temporary modification for drains – Complete
- Bring LAW Facility secondary offgas / vessel vent process system online with baseline drained condition – Complete
- Test system for water buildup – Ongoing
 - LAW Facility primary offgas process system / wet electrostatic precipitator operating configurations
 - Troubleshoot demister drain cup for ability to remain full during system operations and transient conditions
 - Recheck drains and air filters after operating periods to determine rate of water buildup
- Fitness for service evaluation for piping – Following testing
- Plant engineering operability evaluation – Following testing