Designing for Liquid Cooling

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SC14
Nov. 18, 2014
LA-UR-14-28775

UNCLASSIFIED
Long lead time required

- Approximate Timeline:
  - 2011: Liquid cooling engineering study
  - 2012: Design begins, targeting class W2
  - 2013: Design approvals, construction begins
  - 2014: Major construction completed
  - 2015: Site prep, platform arrives

- Design, approvals and construction take years!

- LANL verified design targets through multiple sources including participation on EE HPC WG
Open-Cell Tower Flow Diagram
Infrastructure Upgrades Project
Preparation for Trinity

Project Layout
New 36” Cooling Tower Loop
5 Additional Open-Cell Towers
Before and After
Infrastructure Changes
Mechanical

- (x5) 1200ton open-cell cooling towers with 100HP fans
- (x3) 300HP and (x2) 150HP cooling tower pumps
- (x4) 250HP process pumps
- (x4) 3MW heat exchangers
- (x8) 40mesh basket strainers
- Trane controls
- (x3) AHUs for equipment cooling
Infrastructure Changes for Trinity Chemical Treatment
Back of Row-View

NOTE: Notional Trinity Layout
Underfloor Piping

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Liquid cooling design movie
Abstract

Liquid cooling design, approvals, and construction requires long term planning. LANL plans decades ahead, and initiated the process over 4 years prior to the arrival of our next liquid cooled platform. Major construction is completed at the facility side, and platform-specific site preparation is under way. Liquid cooling enables deployment of energy efficient advanced technology systems and promises to improve the overall energy and water use efficiency by about 25%.