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Report on SC13 Commissioning BoF

TITLE: Best Practices for Commissioning Liquid Cooling Infrastructure

Introduction: Dave Martinez, SNL
Presentation on Liquid Cooling Commissioning Methodology: Tom Durbin, NCSA,
Additional Panelists: Marriann Silveira, LLNL, Detlef Labrenz, LRZ, Michael Ellsworth, IBM

The Energy Efficient HPC Working Group develops and disseminates best practices for maximizing energy efficiency in HPC facilities and systems and serves as a forum for collective action. A sub-team of the EE HPC WG is developing a methodology for commissioning liquid-cooling infrastructure for HPC sites deploying liquid-cooled systems. The team is interested in getting participation and feedback on the draft methodology from an even broader community than that provided by the EE_HPC_WG. This is extremely relevant for anyone involved in fit-up or retrofit of liquid cooling infrastructure for HPC sites. This is a timely and relevant topic as many HPC sites have recently or will soon require infrastructure changes to support the transition from primarily air to liquid cooled systems.

The Bof attendance and participation was strong, with ~ 60 people in attendance. It was advertised through the EE HPC WG website, at the SC13 Workshop on "Building Energy Efficient HPC", as well as at the EE HPC WG Booth on the SC13 Exhibition Floor. Dave Martinez opened the session with introductions. Tom Durbin presented an overview of the draft methodology for commissioning liquid-cooling infrastructure for HPC sites. This took ~20 minutes. Then the floor was opened for questions and general discussion with responses from the five panelists. Each of the participants was given a flash drive that contained a copy of the draft methodology and asked to provide feedback on the document.

Presentations from the BoF (as well as those from a related panel session in a workshop) can be found at: http://eehpcwg.lbl.gov/documents/sc13-technical-program/birds-of-feather

Discussion and feedback from BoF participants:

- I think both days went well. The whole jest behind the paper was to get people thinking of liquid commissioning so they will be prepared for future installs. Dave Martinez, SNL
- These were literal notes captured from questions and comments during the BoF; What is the 10 year projection? What kind of monitoring capabilities do you have? Does this address retrofits? KIT has a rear door installation lessons

learned. Need more vendor involvement up front. Steve Harrington has a negative pressure system example that went fairly well. How can the vendors open up discussions? Natalie Bates, EE HPC WG

- For the 10 yr. question... I think we will want to have ASHRAE include this in their data center book series... probably in the liquid cooling book. Also we will want the vendors to include commissioning steps in their general instructions for their supercomputer installations. I think the rear door lessons learned would be good...we could get our IT people to contribute since we also have rear door coolers. Bill Tschudi, LBNL
- One point that resonated with me commented on in the BoF... Folks seemed to be looking for procedures and/or specifications for specific situations (i.e. new construction vs retrofit)... the commissioning document should be general enough to apply to many if not all possible situations; it should outline a framework or methodology that can be applicable to many scenarios. I think it is general enough, we may want to revisit the abstract to more clearly communicate this. Mike Ellsworth, IBM
- I think we should add in a section regarding who are all of the people that should be involved in the Commissioning Plan and process. There were some questions regarding controls. We could be more descriptive about the necessary controls points that you should have in your system. There was a question regarding retro-commissioning and commissioning in existing facilities so we should address both of these topics as well. Marriann Silveira, LLNL
- We need to address accuracy and calibration of controls. This sounded like a common issue. Bill Tschudi, LBNL
- This could be another paper - integration of control systems for liquid cooling, Dave Martinez, SNL