

03/02/2022

Meeting Attendees: Craig Myers (Nalco), Keegan Yaroch (DOW), Sean Sivapalan (Intel), Philip Yu (Nalco), David Miller (Faradic Enterprises)

Meeting Notes

- Planned completion date is May/June 2022 time frame (hopefully a draft in place by OCP tech week)
- Reviewed plan for PG25 specification and wetted materials and which contributors will work on which section.
- Use treated water spec from Dale Sartor as template for PG25 specification
- Keegan to share document with contributors and divide topics to make sure everything is covered
- Document will be uploaded as shared Google docs by Michael Schill from OCP (Sean, Keegan, Philip and Michael meeting setup for 03/14/2022)
- Start with a new list for contributors
- Updated document with contributors for specific sections (Once Google doc is uploaded, feel free to make edits and comments)
- Nothing existing from ASHRAE to refer to on PG25 for liquid cooling yet (likely it will be a little while till that spec is ready)
- ASTM standards (test methods available) that we can include
- Wetted materials- treated water versus inhibited propylene glycols is an area that need to be addressed.
- Equivalent of water quality table for inhibited propylene glycols
 - Conductivity due to inhibitors (number would need to be high enough to accommodate)
 - High conductivity and total dissolved solids number
- Include specific product for example refractometer. PA-202X 1 MISCO Palm Abbe Refractometer
- PG fluids rely on CoA (Certificate of Analysis) to ensure quality of premixed product arriving at datacenter site. (Quality control)
- Include section on inhibited PG and how that would be used in datacenter liquid cooled loop
- Wetted materials should be included in the final document
- Also option of having one table with treated water/inhibited glycol (acceptable for TCS)

Next Steps

- Sean, Phil, Keegan and Jordan sync with Michael Schill on getting treated water and PG25 Google doc uploaded so contributors can start making suggestions 03/14/2022
- Sean, Phil, Keegan and Jordan sync with Michael Schill on Google doc for meeting minutes for Fluid Serviceability and Maintenance WG (minimize multiple emails) on 03/14/2022

Recorded meeting link (may require organizer login)

https://transcripts.gotomeeting.com/?utm_source=recordingReadyNotification&utm_medium=email#/s/f78240fc89aa888b925cc6e8032b1f49a4aaa47ce9592f452ededa9089067c2d

02/23/2022

Meeting Attendees: Dale Sartor (EEHPC), Craig Myers (Nalco), Keegan Yaroach (DOW, Sean Sivapalan (Intel), David Miller (Faradaic Enterprises)

Meeting Notes

- Dale reviewed the EEHPC WG document “Open Specification for Liquid Cooled Rack Transfer Fluid”
- Document follows the Construction Specifications Institute (CSI) CSI format use by most building projects
- CSI format makes is easier for people to drop in their building specs
- For smaller deployments one possibility that was discussed was the premixed treated water being shipped to the site ready to use.
- However, the typical deployment would have some existing on-site water facilities.
- These types of choices and decisions were highlighted in brackets throughout the document
- Document was written so end-user could go either way (pre-mixed shipped on-site OR using existing on site water treatment expertise)and infrastructure
- Automatic water quality monitoring was another option that was discussed.
 - For systems with 10s of gallons treated water, the cost of implementing automatic water quality monitoring is a major consideration
- Size of the system as well as the criticality of the system factors into the decision making with treated water solutions.

- Even though this an open specification, there are still a lot of choices for the data center facilities operators to consider.
 - Document is NOT geared towards operation.
 - Document DID make recommendations with regards to startup.
 - For example rapid turnaround for testing during startup, as things stabilized would likely test less frequently
 - Would need to add operations and maintenance to this document if that's the direction OCP is going in
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- Agreement to make the current version "Open Specification for Liquid Cooled Rack Transfer Fluid" a working document that OCP Fluid serviceability WG can edit. (Sean T. to send note to Michael Schill and provide link to team)
 - Plan for the document was to have OCP and ASHRAE adopt it in some manner.
 - Per Archana, current path forward would be for a contribution as an OCP requirements document
 - Assumption: Wetted materials list and Transfer fluid specification go together, can't have one without the other
 - For PG25 the wetted materials list would likely be shorter than the treated water wetted materials list
 - Likely metals on the WML would be similar for both PG25 and treated water, anticipate main differences will be polymers
 - For example PVC and C-PVC would need to be excluded for the PG25 wetted materials list
 - Wetted material list in the specification is the least well vetted part of the document
 - Has been conflicts on opinion (for example; to include or not include Nylon as an acceptable wetted material)
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- Preference to not have Aluminum on the wetted materials list
 - EEHPC team spent many meetings with component vendors that have Aluminum components
 - Also many examples of horror stories were raised.
 - Conclusion was that although it was possible to have Aluminum it would require significant more maintenance and care of the transfer fluid
 - Corrosion behavior of Aluminum is highly alloyed
 - 6061 is relatively easy to protect
 - 7000 series is much trickier due to Magnesium content
 - Plated Aluminum products in particular is a grey area. Plating gets damaged)
 - Similar durability concerns to nickel plated brass, repeated use would likely reveal underlying metal.

- For galvanic corrosion related concerns with both Aluminum and Copper in the same loop
 - Recommendation would be to ensure the soluble copper is below 50 ppb (need to ensure analytical technique ICP-MS instrument used can detect to this level.
 - Azole corrosion inhibitor protection is a must have to ensure such low levels of soluble copper.
- Other materials of some debate was 304 and 321 Stainless steel, which would required very low levels Chloride to reduce the risk of crevice corrosion. Also recommend not to use 303

- Spec was written to minimize the use of chemicals such biocides where possible
- Craig (Nalco) and David Miller (Faradaic Enterprises) to review materials list and provide input.
- Prefer to only have acceptable materials in the final version of the document. Remove section on materials to avoid

Options for PG25 and treated water specifications and wetted materials list

Option 1

- One treated water specification and wetted materials list
- One PG25 specification and wetted materials list

Option 2

- One treated water specification
- One PG25 specification
- One wetted materials list that has two columns; one column are acceptable materials for PG25 and another column for acceptable materials for treated water.

Maybe easier to do Option 1 in terms of a formal contribution to OCP.

02/02/2022

Meeting Attendees: Philip (Nalco), John C. (DOW), Ashwin (Motivair), Craig M (Nalco), Saurabh (Meta), John F. (Meta), Keegan (DOW), Sean T. (Intel)

- Kick off meeting for new work stream Fluid Serviceability and Maintenance Workstream as part of OCP ACS Cold Plate Sub-Project

- Philip (Nalco) and Keegan (DOW) to be work stream co-leads. Philip will focus on the treated water contribution and Keegan on the inhibited glycol contribution
 - co-leads will ensure content sections has appropriate owners and to track progress to deliver at least one white paper by May 2022
 - meeting invites will be managed by Michael Schill. (*Standing bi-weekly meeting will be in place*)
- Agreement that there will be two initial white paper/requirements activities to focus on, one for Inhibited Glycols and one for treated water

- For treated water, Dale Sartor and Natalie Bates from EEHP (Energy Efficiency High Computing) have a transfer specification they are open to contributing.
 - Sean T. to sync with Dale and Natalie 02/03 and see if content can be reviewed at next OCP Fluid Serviceability and Maintenance Workstream meeting on 02/16/2022
 - Philip/Dale have sent EEHP treated water transfer specification ahead of time for us to review. (see attached "23500 Transfer Fluid Water Treatment For Closed Loop Hydronic Systems 011022)
 - Plan is to submit the EEHP transfer specification as an OCP requirements document.
 - Craig Myers (Nalco) to help review wetted materials as it appears the list is specific to propylene glycol, maybe additional materials that could be included.

- For treated water, John and Keegan (DOW) to help review the draft content from the OCP Fluid Servicing Datacenter Liquid Cooling Rev1 and take out content that is likely treated water specific.
 - Mainly content related to biocide as at PG25% and above biocide is not need. (Propylene Glycol is biostatic and limits bio-growth)
 - David Miller formerly of Huntsman will be able to also provide suggestions on the Inhibited Glycol content.