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C1Po1E-04: LCLS-II Cryoplant Cooling Water System: Challenges and Remediation

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The SLAC National Accelerator Laboratory houses LCLS-II, a superconducting linear accelerator (LINAC) that began operations in October 2023. Central to this advanced accelerator technology are two 4 kW @ 2.0 K Cryoplants. Supporting their operation is a dedicated Cooling Water System (CWS) with a total capacity of 2,000 m^3/h. Most of the water is directed to the Warm Helium Compressor (WHC) stations, which deliver a combined mechanical power of approximately 9.0 MW. Additionally, the CWS supplies a secondary water loop with finer filtration to serve smaller components such as recovery compressors, expansion turbines, cold compressors, and vacuum pumps. This paper describes the SLAC CWS and reviews the challenges encountered with cooling water chemistry during the first year of operation, focusing on their potential impact on cryoplant availability and the remediation strategies employed.

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