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ALS BL5.0 photon stop recovery

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In June of 2023, the Advanced Light Source (ALS) at Lawrence Berkeley National Laboratory, Berkeley, California, United States, experienced a vacuum interlock event that caused a beam dump. Upon investigation, the vacuum technicians discovered a leak in the cooling system of a custom photon stop in Sector 5 (12 total). This paper will detail the event, the temporary restoration of operations, and the process of how a new photon stop was designed, analyzed, fabricated, assembled, tested, qualified, installed and commissioned in a fourteen week window. Over 20 years had passed since the original photon stop was installed in the ALS. Since then, the technology landscape has changed and many of the manufacturing capabilities have lapsed or become extinct not only in the United States, but across international boundaries. This is especially true of brazing. There is a parallel discussion of the causality for the failure which led to the destructive evaluation of the original photon stop. Finally, engineering looked at the thermal fatigue analysis and provided the operation staff with a specific tool to evaluate and maintain the new photon stop.

Footnotes

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