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C1Or4B-08: Progress on design and construction of a new Helium liquefaction system at LBL

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A new helium liquefaction system with high capacity is under design and will be built at the Lawrence Berkeley National Laboratory (LBL) in the next couple of years to replace a 43 years old liquefier. The new liquefaction system will provide at least a mixed 80 liter per hour liquefaction rate and 35 W refrigeration capacity at 4.5K without liquid nitrogen pre-cooling, or a mixed 140 liter per hour liquefaction rate and 35 W refrigeration capacity at 4.5 K with liquid nitrogen pre-cooling. As a core element, the new liquefaction system will significantly improve the capability and efficiency of the magnet testing system at LBL in developing and testing novel magnet configurations. The system is designed and built with the capability to be further expanded to 1.8 K to 2 K by adopting a warm pumping system, as well as to furthermore enable future integration of helium recovery and purification capability. It can be operated as a liquefier to produce liquid helium to the users at the LBL, UCB (University of California Berkeley), or other institutes and labs. It can be operated to provide both liquid helium and refrigeration for superconducting magnet testing. It can run at various operating modes. This paper describes the recent progress of design and construction of the new LBL's liquefaction system.

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