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Progress towards the completion of the Proton Power Upgrade project

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The Proton Power Upgrade project at the Spallation Neutron Source at Oak Ridge National Laboratory will increase the proton beam power capability from 1.4 to 2.8 MW. Upon completion in early 2025, 2 MW of beam power will be available for neutron production at the existing first target station (FTS) with the remaining beam power available for the future second target station (STS). The project has installed seven superconducting radio-frequency (RF) cryomodules and supporting RF power systems to increase the beam energy by 30% to 1.3 GeV, and the beam current will be increased by 50%. The injection and extraction region of the accumulator ring are being upgraded, and a new 2 MW mercury target has been developed along with supporting equipment for high-flow gas injection to mitigate cavitation and fatigue stress. The first four cryomodules and supporting systems were commissioned in 2022-2023 and supported neutron production at 1.05 GeV, 1.7 MW with high reliability. The first-articled 2 MW target was operated successfully for approximately 4400 MW-Hours over two run periods. The long outage began in August 2023 for installation of the remaining technical equipment and construction of the Ring-to-Target Beam Transport tunnel stub that will enable connection to the STS without interrupting operation of the FTS. The upgrade is proceeding on-schedule and on-budget, and resumption of neutron production for the user program is planned for July 2024.

Footnotes

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