China Spallation Neutron Source: Beam power reaches design goal ahead of schedule

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The China Spallation Neutron Source (CSNS) conducted on-schedule beam commissioning from Feb. 3 to Feb. 28, thus achieving its design goal of 100kW 18 months ahead of schedule. Since then it has conducted stable operations at 100 kW.

CSNS project passed the national acceptance and was officially opened to users on Aug. 23, 2018. Based on the commissioning and operating experience of other facilities around the world, scientists had planned for CSNS beam power to reach its design goal three years after acceptance. Since then, plans were made to gradually increasing the beam power and much efforts were paid by the CSNS team to achieve its design goal faster. In September 2018, the operating beam power was 20kW. In January 2019, the beam power was increased to 50kW. In October 2019, the beam power was increased to 80kW, and now it has achieved the design goal of 100kW.

The hardest part of high power accelerator beam commissioning is to control the beam loss. CSNS has performed well, since the uncontrollable beam loss at 100kW is even less than when operated at 80kW.

Besides the machine development, CSNS has also achieved a successful operation for user experiments in 2019. CSNS originally planned to provide 3600 hours of beam time to users. In fact, it provided a total of 4576 hours, for an beam availability of accelerator operation of 92.6%.

The efficiency of CSNS's recent beam commissioning offers valuable design-related experience for the upcoming CSNS Phase II project.

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