

A.1: Status report on operation of Indus accelerators

The synchrotron radiation sources, Indus-1 and Indus-2 maintained excellent operational performance during the second half of 2022 (July - December). These machines, constituting a national facility, provided synchrotron radiation (SR) beam to the users regularly on round-the-clock basis.

In the said period, both the machines were operated smoothly following the prescribed safety procedures. Three planned shutdowns of 4 to 7 days, totaling 16 days, were taken for preventive maintenance and upgradations. Taking this into account, the machines were operated in round-the-clock mode for 168 days. The beam availability in Indus-1 was 3424 hrs. (~20.4 hrs./day) and in Indus-2, it was 2893 hrs. (~17.2 hrs./day). With this, in the calendar year 2022, Indus-2 was operated for 339 days and total beam availability to users was 5601 hrs., which is highest for any calendar year.

Typical user mode operation of Indus-1 is shown in Figure A.1.1 and for Indus-2 in Figure A.1.2.

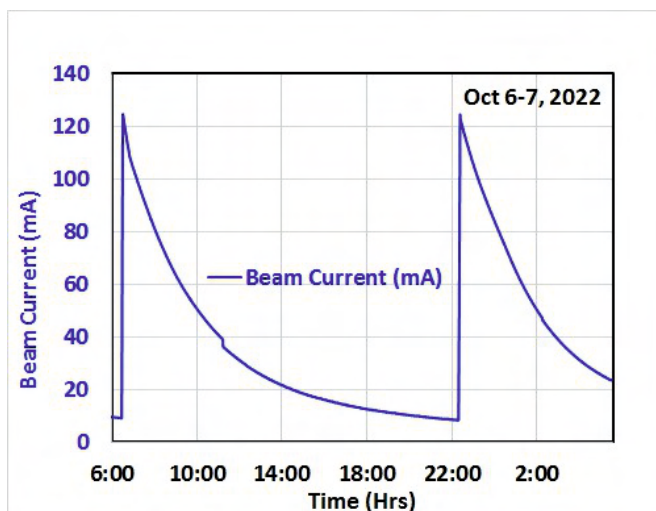


Fig. A.1.1: Typical user mode operation of Indus-1.

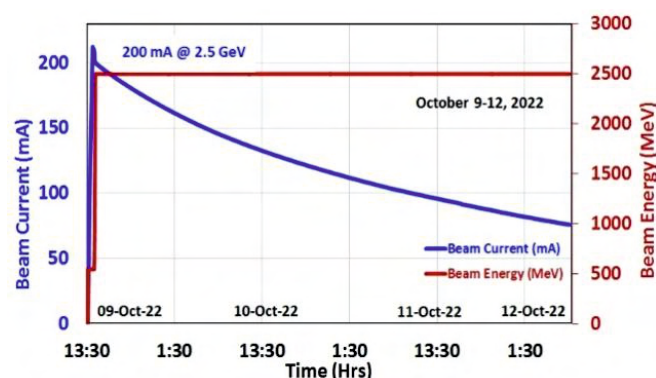


Fig. A.1.2: Typical user mode operation of Indus-2.

Utilization: A total of seven beamlines are operational in Indus-1. In Indus-2, the APPLE-2 type undulator based X-ray Magnetic Circular Dichroism (XMCD) beamline, BL-20, which was under trial operation, received regular operation permission from atomic energy regulatory board (AERB). With this, the total number of operational beamlines in Indus-2 has increased to 18. The total number of user experiments carried out in the reported period was 517. It is worth mentioning that the total number of user experiments carried out during the calendar year 2022 is 991, which is the highest number of experiments carried out in a year so far.

Machine studies: Eleven days were reserved for experiments related to machine studies and improvements. Some of the important experiments carried out in Indus-2 during these days are: (a) Operation at low emittance optics and (b) Beam injection experiment to observe the effect of Indus-2 dipole current and injection kickers on accumulated beam.

Training qualification and licensing (TQL) programme: The 5th TQL programme was started in July 2022. Under this programme, more than 40 personnel are being trained at qualifying levels 3, 4 and 5. Training through lectures and its evaluation through written examination have been completed by December 2022. After completion of the remaining steps of training and evaluation, these personnel shall be deployed for round-the-clock operation of Indus facility.

Implementation of qualification incentive scheme of the DAE for Indus facility: In April 2022, Department of Atomic Energy (DAE) issued office memorandum regarding inclusion of Indus synchrotron radiation facility under the qualification incentive scheme of the department with effect from May 2022, which is a recognition to the comprehensive training requirement for operation of the facility.

Various documents under this scheme were compiled and formalities were completed for eligible trained operation staff of the Indus facility. Accordingly, they have started getting the qualification incentive as per the norms and guidelines of the scheme.

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