

Reinstallation of heavy HWR-B Cryomodule for SCL3 beamline maintenance

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This paper presents a case study on the reinstallation of heavy weight cryomodule (HWR-B #11) for the SCL3 beamline maintenance. Our HWR-B unit consists of a cryomodule and an associated warm-section (including a quadrupole magnet and a vacuum chamber) with a total weight exceeding 12.5 tons. After the initial beam commissioning, we found that certain low-efficiency modules required overhaul & repair to prepare for subsequent beam experiments.

In particular, the processes of disassembling a large HWR-B cryomodule from the beamline and moving it out of the underground accelerator tunnel needs very strict safety requirements and detailed planning and coordination among related systems and teams. To perform these tasks efficiently and safely, we prepared pre-designed tools and equipment, formed related work groups for collaboration, and performed preliminary work such as cutting VBx-CM pipes, separating various cables, cooling water pipes, and RF rigid coaxial transmission lines.

During the first stage of the maintenance procedure, the HWR-B #11 Cryomodule was safely removed from the SCL3 beamline using a specially designed moving wheel and then delivered to the contractor for overhaul. After the overhaul & test were completed, the HWR-B #11 Cryomodule was returned to the SCL3 tunnel and reinstalled into its original position in the beamline using the dedicated moving wheels and hydraulics. At this time, great care and attention was required to prevent steel frame overlap, quadrupole magnet contact, pipe-to-pipe impact, and cable breakage in the narrow space between the front and back of the HWR Cryomodule. This first in-house beamline maintenance experience provided valuable insight and expertise for the ongoing operation of an accelerator beamline.

Paper submission Plan

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Best Presentation

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Contribution track

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