

OVERVIEW OF BEAM INSTRUMENTATIONS FOR HIGH-POWER OPERATION OF THE SPALLATION NEUTRON SOURCE

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Abstract

The Spallation Neutron Source (SNS) has been in commissioning and then operation since 2002. Beam Instruments for full operation and transition to beam powers of 1.0 MW and beyond needs to evolve to mostly non-intrusive, parasitically available and functioning at 30-60 Hz. High power operation necessitates careful monitoring to minimize uncontrolled losses. In this paper, we discuss the overview of all diagnostics and present new improvements to, beam loss monitoring system, transverse and longitudinal laser profile monitors, introduction of laser emittance, addition of view screens at various locations and Mid-IR camera to observe electron deposit due to carbon foils at ring injection area. We also present the challenges in the ring instrumentations to have three decades of response and .01% losses.

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