Pre-Assembly and Alignment of PROSCAN Beamlines

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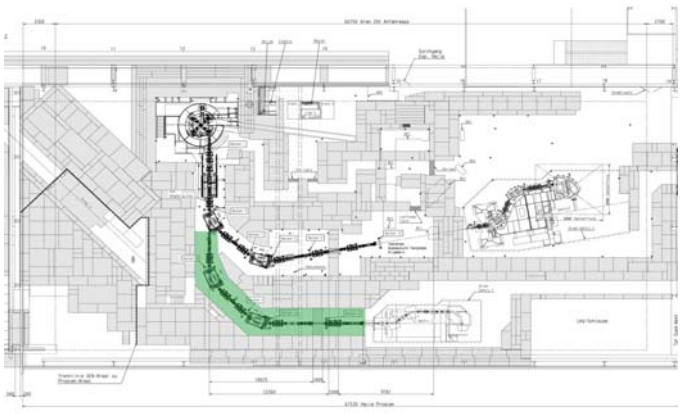
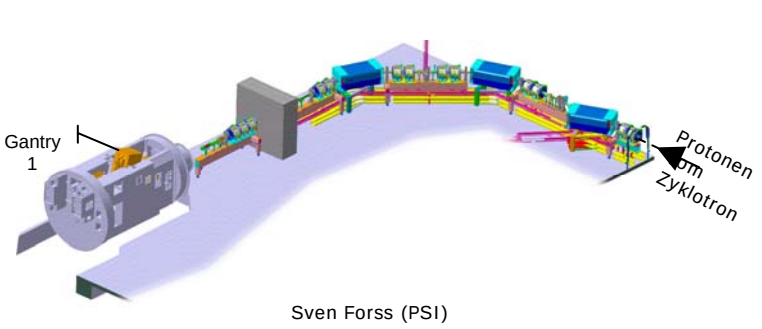
The PROSCAN-Project at Paul Scherrer Institut (PSI) in Switzerland includes the installation and operation of a unique proton therapy facility. The commissioning and testing of the compact superconducting 250 MeV-cyclotron called COMET have been started in February 2004. The connection of the new cyclotron to the existing proton therapy gantry has been installed in spring of 2006.
Due to the tight time schedule and the limited accessibility a complete pre-assembly and pre-alignment procedure has been performed, using the LEICA Lasertracker LTD800 combined with NIVEL20 and WILD N3 data for the leveling. Based on this installation procedure, the final installation was considerably accelerated and simplified.





Sven Forss (PSI)

Pre-Assembly and Pre-Alignment (Assembly-Hall)

-Creation the temporary local survey network.

-Marking of the positions for girders, support frames and beamaxis.

-Marking of the boundaries (walls, cabel-channels, obstacles, shielding-blocks).

-Assembly and alignment of the girders, magnets, diagnostics, vakuum-pipes, etc.

-Preparation of the infrastructure (cabling, piping, cooling system, pneumatics, etc.).

-Acceptance test (cabling, vacuum).

-Partial disassembly of modules (girders, triplets, duplets).

Installation and final Alignment (On-Site)

-Extension of the alignment network (setting marks, survey).

-Marking of the positions for girders, support frames and beamaxis.

-Installation and pre-alignment of the girders (targeted accuracy for pre-alignment 1mm).

-Installation of the prepared infrastructure.

-Placement of shielding blocks, roof beams.

-Survey of the alignment network (LTD800+Nivel20 und N3) including adjacent branches considering the settlement,.

-Final alignment of all components (aimed accuracy for final alignment 0.2mm (local)).

Benefits

-Pre-alignment of the functional units.

-Most of the acceptance tests confirmed before commisioning.

-Opportunity for complete inventory count (material, drawings)

-Customization of Infrastructure (Conflicts)

-Simplification and acceleration of beamline installation.

Consessions

-Required space (Assembly-Hall).

-Healthy time margin (delivery -> installation).

-Higher demands for transportation.