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## Practical Realization of Service Concepts for the Siemens Particle Therapy (PT) Systems

The Siemens Company (SAG) is currently building and commissioning particle therapy facilities for cancer treatment at Marburg and Kiel in Germany and at Shanghai / China. The accelerator of these facilities consists basically of a combination of Electron Cyclotron Resonance Ion Sources (ECRIS) and Radio Frequency Quadrupole (RFQ) together with Interdigital - H (IH) accelerators as injector for a synchrotron which delivers up to 250 MeV protons or 430 MeV/u carbon ions respectively. The accelerator design is based on a prototype at HIT (Heidelberger Ionenstrahl Therapie), where patients are treated since Nov. 2009, mainly with carbon ion beams.

What all PT facilities have in common is the required high uptime to allow for a maximum number of patients to be treated during the year and to strictly avoid incomplete treatment fractions. To achieve these high uptimes and ensure a high reliability and reproducibility, a lot of effort has been spent during the design phase, introducing technically innovative components like e.g. a digital low level rf-system for the Linac amplifiers and an Accelerator Control System (ACS) which is designed to log almost all available machine data for preventive maintenance purposes.

In parallel to technical considerations a maintenance concept was developed which combines preventive maintenance aspects from SAG power plant operation (Siemens Energy) with dedicated new maintenance models from our accelerator group at PT.

The poster will describe our PT accelerator and give an overview of the maintenance concepts and tools we use to optimize uptime and reliability of our therapy system.

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