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High-reliability and high-performance machine protection system for a demanding electron linac

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LightHouse was a project utilizing a 3 MW electron linac to produce medical isotopes, requiring a very fast and reliable machine protection system to protect key accelerator components. RI Research Instruments GmbH designed the linac and conducted the risk analysis. This led to specifications to which Cosylab engineered a machine protection system (MPS). The MPS exhibits rapid responsiveness, with short reaction times on the order of 350 nanoseconds, while actively monitoring and reacting to approximately 700 inputs from crucial accelerator components. To enhance reliability and upgradeability, an FPGA solution based on the National Instruments platform was implemented. Additionally, the project envisions the integration of high availability storage and tertiary subsystems, with the overarching goal of achieving elevated uptime and ensuring the trustworthiness of all device elements.

Footnotes

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Europe

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