SRF2025 TOKYO

22ND INTERNATIONAL CONFERENCE ON RF SUPERCONDUCTIVITY

September 21-26, 2025

Contribution ID: **109** Contribution code: **MOP77** Type: **Poster Presentation**

First ESS LINAC cooldown using the master automatic control sequence

Monday 22 September 2025 14:30 (3 hours)

This paper presents the key aspects of the cryogenic integrated control system for the ESS superconducting linear accelerator and its importance during the first operational experience in a LINAC configuration, enabling 2 MW beam power and beyond. This unified system is controlled by a master PLC managing the full CMDS (Cryomodules and Cryogenic distribution System) consisting of 43 cells, each comprising a Cryomodule with 352.21 MHz Double-Spoke or 704.42 MHz elliptical SRF cavities, and a valve box, which in turn are controlled by their own dedicated PLC. A key aspect of this integrated control system is the Master Automatic Control Sequence (MACS), which allows for the simultaneous cryogenic operation of the entire LINAC, managing and coordinating the different phases required for cryogenic operation, while handling failure response protocols and operator interface requirements. The paper also highlights lessons learned during the operation, identifies areas for improvement, and proposes strategies for optimizing SRF cryogenic controls in the upcoming phases of the ESS project.

I have read and accept the Privacy Policy Statement

Yes

Footnotes

Funding Agency

Author: Mr ASENSI, Emilio (European Spallation Source)

Co-authors: FONTOURA, Adalberto (European Spallation Source); CARDONA, Horus (European Spallation Source); ZHANG, Jianqin (European Spallation Source); SKIBA, Marek (European Spallation Source); BASKAR, Nishanthi (European Spallation Source); ELIAS, Nuno (European Spallation Source); HALCZYNSKI, Pawel (Institute of Nuclear Physics, Polish Academy of Sciences); NILSSON, Per (European Spallation Source); ARNOLD, Philipp (European Spallation Source); GAJ, Wawrzyniec (Institute of Nuclear Physics, Polish Academy of Sciences)

Presenter: Mr ASENSI, Emilio (European Spallation Source)

Session Classification: Monday Poster Session

Track Classification: MC4: SRF Technologies