**Current Status: Project Overview**

**Linear accelerator**
First section commissioned
Remaining sections delivered during 2020-21, mostly from in-kind contributions

**Target station**
Control systems currently in design phase.
Several commercial and in-kind projects are running to ensure timely delivery of all systems

**Neutron instruments**
Control systems currently in design phase.
Several instrument projects are executing in parallel, mainly as in-kind contributions.
Current Status: Integrated Control System

- Work package 01: Management and administration
- Work package 03: Software core
- Work package 04: Hardware core
- Work package 05: Machine protection
- Work package 06: Equipment
- Work package 07: Control system infrastructure
- Work package 08: Physics
- Work package 09: Personnel safety systems
- Work package 10: Integration - Accelerator
- Work package 11: Integration - Target
- Work package 12: Integration - Instruments
- Work package 13: Integration - Conventional facilities
- Work package 14: Test Stands
- Work package 20: Installation
Current Status: Hardware Standardization

- **MicroTCA®** is a modular, open standard for building high performance switched fabric computer systems in a small form factor. Because of its modularity and flexibility, MicroTCA is well-suited for industrial control and automation systems. MicroTCA defines fully redundant system configurations including power budgeting, hot-swap, complete component and system management that allows failure detection and isolation. This greatly improves system reliability and availability.

- **EtherCAT** is a modern high-speed industrial automation system standard which enables faster data interchange with deterministic timing and higher processing power than traditional industrial automation systems. EtherCAT systems at ESS are connected to the EPICS control layer.

- Slower signals are handled by industrial automation (PLC) for reliability and cost reasons. The standardised platform for ESS applications comes from Siemens.
Upcoming challenges: 3 year perspective

• Staying on schedule. The installation and commissioning schedule for the next years is challenging.

• Staying on budget. There is not much contingency in the ESS budget.

• Ensuring maintainability of the ESS facility. To ensure a sustainable facility we need to ensure a high level of standardization of hardware and software.
Needed competences and capabilities of suppliers

In order to help us overcome the challenges we need suppliers that can:

• Provide delivery of hardware quickly and be flexible in planning of delivery volumes

• Provide the best possible pricing on every piece of equipment

• Provide equipment from the standardized hardware types selected for the ESS project
Upcoming procurements

• No major procurements of control system hardware currently planned.

• Smaller procurements are done continuously for spares, labs and equipment not covered by the major categories.

• We will be looking to procure hardware maintenance and/or support contracts for installed and commissioned systems

• ESS website for upcoming procurements: https://europeanspallationsource.se/partners-industry
Summary

• The European Spallation Source is in a hectic phase of parallel design, development, installation and commissioning of control systems.

• To ensure availability and competitive pricing of hardware suppliers are continuously evaluated.

• The ESS project will be running for years to come, and after construction is finalized new needs for hardware will undoubtedly emerge.