



**EUROPEAN
SPALLATION
SOURCE**



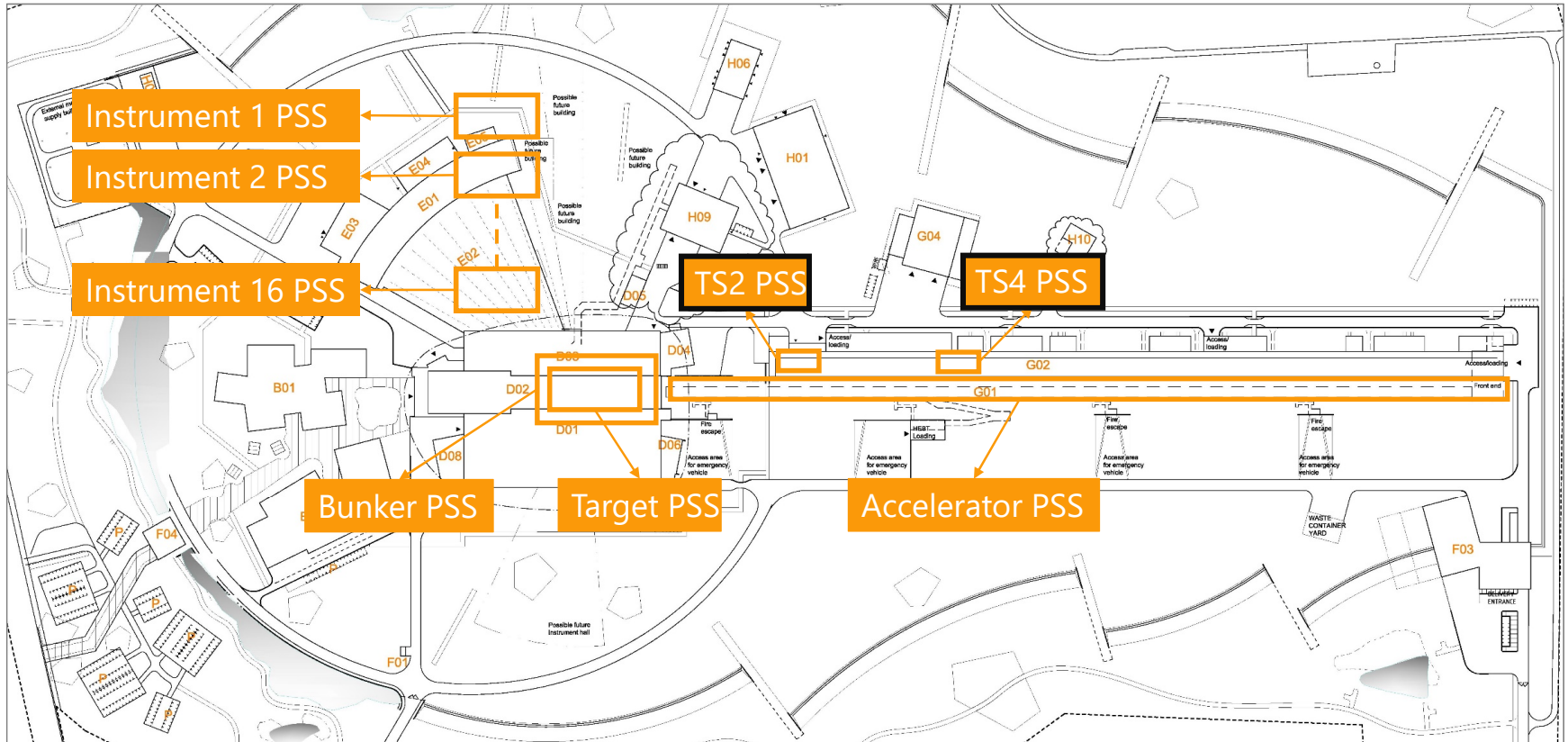
Personnel Safety Systems for ESS Beam on Dump and Beam on Target Operations

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Personnel Safety Systems at ESS



ESS PSS architecture



- In certain hazardous scenarios, TS PSS, Bunker PSS and each Instrument PSS need to request ACC PSS to prevent proton beam to Target. **In order to ensure a robust and reliable interlink between different PSS Systems, a centralised system called Nexus PSS, which interfaces all other PSS systems**, is used for this purpose.
- The PSS architecture is designed in a scalable fashion, and the adopted technologies have the capacity to support full accelerator power and energy, and 20+ neutron instruments.
 - Within ESS, each individual PSS, e.g. the PSS for the accelerator, operates with its dedicated PLC, which is connected to field devices and the Equipment Under Control (EUC) through remote input/output modules. These modules facilitate communication with the system PLC via PROFIsafe protocol, ensuring efficient and secure data exchange.
 - The other PSS at ESS, e.g. the PSS for neutron instruments or target station, need to have an interface with Accelerator PSS through Nexus PSS. The Nexus PSS stretches across the facility over a fiber ring, and interfaces each PSS through hardwired connection.

PSS commissioning strategy



- Hardware Factory Acceptance Test (HW FAT)
- Hardware Site Acceptance Test (HW SAT)
- Software pre-FAT
- Local Functional Testing
- Integrated Functional Testing

PSS Interfaces	BoD	BoT	SOUP	5 MW
ISrc (HVPS & HV platform)	Y	Y	Y	Y
RFQ RF system	Y	Y	Y	Y
MEBT RF systems (x3)	Y	Y	Y	Y
DTLs RF systems (x5)	Y	Y	Y	Y
Spoke RF systems (x26)	Y	Y	Y	Y
MBL RF systems	Y	Y	Y	Y
HBL RF systems (HBL-010, HBL-020)	Y	Y	Y	Y
HBL RF systems (HBL-030, HBL-040, HBL-050)	N	N	Y	Y
HBL RF systems (the remaining ones)	N	N	N	Y
Bending magnets	N	Y	Y	Y
Gamma blocker	N	Y	Y	Y
PBDR isolation valve	N	Y	Y	Y
Safety Helium Collector (SHC) valves	Y	Y	Y	Y
Radiation monitors (x34)	Y	Y	Y	Y
Physical access control system	Y	Y	Y	Y
Nexus (it requires update, every time an instrument becomes online)	N	Y	Y	Y



Thank you!