

IFMIF-DONES Control Systems: General Architecture

Wednesday, 9 April 2025 09:00 (20 minutes)

IFMIF-DONES (International Fusion Materials Irradiation Facility - DEMO-Oriented NEutron Source) is a cutting-edge neutron irradiation facility under construction as part of the European fusion roadmap. Located in Granada, Spain, its primary objective is to validate and qualify materials to be used in fusion reactors. The construction phase, initiated in March 2023 following the first DONES Steering Committee, is progressing under the framework of the DONES Programme, with initial in-kind contributions, including those related to the Control Systems, currently being formalized.

The IFMIF-DONES Control Systems are structured into two levels: the Central Instrumentation and Control Systems (CICS) and the Local Instrumentation and Control Systems (LICS), interconnected through a complex network infrastructure. The CICS comprises three control systems: Control, Data Access and Communication (CODAC), responsible for implementing normal operation by providing central supervision and control, timing management, data management, alarm and warning handling, system administration, and software; Machine Protection System (MPS), ensuring machine protection functions against facility failures, CODAC malfunctions, or potential operational errors; and Safety Control System (SCS), that implements the safety functions to protect personnel and the environment. Several of the technologies envisioned for these systems have been extensively tested in recent years through the LIPAc prototype. This presentation will provide a detailed overview of the IFMIF-DONES Control Systems architecture, focusing on the evaluation process of the most suitable control framework by comparing other solutions with EPICS.

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Session Classification: EPICS Plenary Session

Track Classification: Site updates