Contribution ID: **102** Type: **Poster presentation**

Current status of SPIDER CODAS and its evolution towards the ITER compliant NBI CODAS

Friday, 10 June 2016 10:30 (1h 35m)

The ITER Neutral Beam (NBI) Test Facility currently under construction at Padova, Italy, is composed of two experiments: SPIDER to test the beam source and MITICA to test the whole Neutral Beam Injector (NBI). While the former is meant to represent an experiment for the test facility internal activities, the latter will represent the final design of the ITER NBI component, required to heat the plasma so that nuclear fusion can occur. Consequently, for the Control and Data Acquisition system (CODAS) of SPIDER there were no requirements for compliance with ITER CODAS, while MITICA CODAS will comply to the ITER directives for CODAS management because that system will be eventually interfaced to ITER CODAS. For this reason, even if not strictly required, SPIDER CODAS adopted several guidelines from ITER such as the usage of EPICS for plant supervision and the use of hardware devices from the ITER catalog. Other tools not mandated by ITER have been used for real-time control and data acquisition. These tools have been chosen for two main reasons, that is, ITER did not provide an indication for those components yet, and the adopted tools are widely used in the fusion community. SPIDER CODAS is currently under commissioning and the integration of the different frameworks proved to be successful. The experience and solutions gained in SPIDER CODAS development will be reused as far as possible in MITICA and, in order to maintain at the same time the required compatibility, a set of ITER-like layers (networks) will be defined, using exactly the same protocol defined for the ITER interfaces. This methodology results in a plug-in approach: the NBI system will be developed and tested connected to the other control components of the test facility via ITER compliant interfaces. When delivered to ITER, no change will occur from the NBI CODAS perspective being data and control communication delivered this time to ITER CODAS using exactly the same interfaces.

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Session Classification: Poster Session 2

Track Classification: Control, Monitoring,Test and Real Time Diagnostics Systems