Contribution ID: **233** Type: **not specified**

Completion of the JT-60 SA Toroidal Field coils tests in the Cold Test Facility

Thursday, 20 September 2018 15:10 (20 minutes)

JT-60SA is a fusion experiment which is jointly constructed by Japan and Europe and which shall contribute to the early realization of fusion energy, by providing support to the operation of ITER, and by addressing key physics issues for ITER and DEMO. In order to achieve these goals, the existing JT-60U experiment will be upgraded to JT-60SA by using superconducting coils. The 18 TF coils of the JT-60SA device and its two spare coils are provided by European industry and tested in a Cold Test Facility (CTF) at CEA Saclay. At the summer 2018, all the 20 TF coils will have been successfully tested at the nominal current of 25.7 kA and at a temperature between 5 K and 7.5 K. The main objective of these tests is to check the TF coils performances and hence mitigate the fabrication risks. These tests allowed checking a certain number of performances of the TF coils: DC/AC insulation, cooling down characterization, RRR of the conductor, pressure drop in the winding pack and temperature margin against a quench. More operation or fault scenarios will even be tested on the two spare coils. This paper will give an overview of the main experimental results obtained during these tests and show some statistics over the 20 coils. The main performances of each coil will be summarized, analyzed and discussed in the light of the expected TF coils performances. The main problems met during tests and solutions found will also be highlighted.

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Session Classification: O3.B