Contribution ID: **395** Type: **Poster**

Qualification of ITER Correction Coil Superconductor Joint

Wednesday 7 June 2017 13:40 (2 hours)

The system of Correction Coils (CC) is a component of the ITER Magnet system, required to correct toroidal asymmetries and reduce error magnetic fields detrimental for physical processes in the plasma. Coil terminals will be connected to feeder terminals using twin-box joints. Qualification of the manufacturing procedure of the coil terminals is achieved by performing DC tests of prototype joints in relevant conditions of current, temperature and background field (4.5 K, 10 kA, 2.5 T).
In order to control the DC resistance and AC loss, special tooling and processes were developed. The main processes of CC joint are Conductor de-jacket, Nickel removal, Silver and TIG welding. Two samples were manufactured in 2015 and 2016 for measuring the DC resistance and AC loss. Joint sample performance was analysed after 1000 electromagnetic cyclic loading. The tests were carried out by SULTAN facility and ASIPP facility. All the measurement results shows CC joint samples DC resistance under 5nΩ, AC loss under 7J/cycle.
Index Terms —ITER, Correction Coil (CC), joint, qualification.

Eligible for student paper award?

No

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Session Classification: W.POS: Poster Session W

Track Classification: Magnets