Contribution ID: **1171** Type: **Poster Presentation of 1h45m**

Superconducting Feeder System For ITER Central Solenoid Module Final Test Facility

Tuesday 29 August 2017 13:15 (1h 45m)

General Atomics (GA) is fabricating the ITER Central Solenoid Modules (CSM). The production contract also includes the design and qualification of tooling necessary for fabrication and full current cold testing. Each of the seven
modules will undergo final testing at GA to verify performance. GA is currently commissioning the Final Test Facility at the CSM Manufacturing site in Poway, California. The facility includes a number of critical subsystems including the feeder system (FS), supplied by ASIPP, that connects the test chamber to the cryogenic and electrical systems. It includes a coil termination box, high temperature super-conducting current leads, and a feeder duct.The FS carries the current (50kA) and supercritical Helium (4.5K, 5.5 bara) to the CSM and its supporting structure, while monitoring and controlling the temperature, pressure, flow and voltage drop through all elements of the superconducting components. It functions as an integral part of the system to rapidly (6s decay time) issipate 1 GJ energy stored in the coils, and to protect the cryogenic system. The system is complex, requiring multidisciplinary engineering including High Temperature Superconductivity, cryogenic-temperatures (77, 50, 4.5K), high vacuum (1.0 x 10-5 Pa), redundant quench detection (Voltage, temperature), high voltage insulation (15 kV), low thermal loads (70 W), and low electrical joint resistance (2 nΩ), Paschen testing, high voltage signal measurements and high current electronics. The system presented significant challenges for design and analysis, complex manufacturing assembly processes, measurement and control, and stringent quality and safety requirements. The positive cooperation between GA and ASIPP resulted in successful design and integration, manufacturing and assembly, factory acceptance testing, transfer to GA, and site acceptance test completed in Feb. 2017.
Work supported by UT-Battelle/Oak Ridge National Laboratory under sponsorship of the U.S. DOE Office of Science under Awards 4000103039 and DE-AC05-00OR22725.

Submitters Country

USA

Author: Dr PIEC, Zbigniew (General Atomics)

Presenter: Dr PIEC, Zbigniew (General Atomics)

Session Classification: Tue-Af-Po2.03

Track Classification: B1 - Superconducting Magnets for Fusion