TITLE

ITER central solenoid module fabrication program

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PAPER

General Atomics (GA) is under contract to manufacture the ITER Central Solenoid Modules (CSM). The contract is managed by US ITER at Oak Ridge National Laboratory, under the sponsorship of the Department of Energy Office of Science. The contract includes the design of manufacturing processes and tooling to fabricate seven CSM (6 + 1 spare) that constitute the ITER Central Solenoid. The modules will be delivered to the ITER site during 2016–2018.

GA has established a fabrication facility that combines 1,500 m^2 of offices with 6,000 m^2 of fabrication space. Extensive building modifications were made in anticipation of the first tooling station which arrived in February 2014. The facility utilizes several cranes with up to 35T capability to handle and move delivered conductor and wound pancakes during the winding, joint and lead fabrication, and stacking operations. The assembled 110 ton coil is moved via a self-propelled air bearing cart designed specifically for this application.

Critical systems have been designed, built and initial testing completed for use in fabricating the CSM. The winding stations were designed, built and successfully tested at the Tauring S.p.A factory in Turin Italy. The reaction heat treatment furnace has been designed, built and tested at Seco-Warwick facility in Sweibodzin, Poland. Insulating wrapping heads were completed by Ridgway Machines Ltd of Leicester, England and shipped to GA. Several other key tooling stations for joining the coil segments, insulating the turns and vacuum pressure impregnation equipment have been designed and built by GA. Qualification of the equipment is completed with Factory Acceptance Tests at the supplier's facility, Site Acceptance Tests at GA, and lastly the production of the mockup coil prior to using the station for producing the first CS module.

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