

General Atomics: Overview and Support of ITER

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ITER CS Module Fabrication

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General Atomics Broad Expertise in Advanced Technology Systems For Defense and Energy



Aircraft
Launch and Recovery



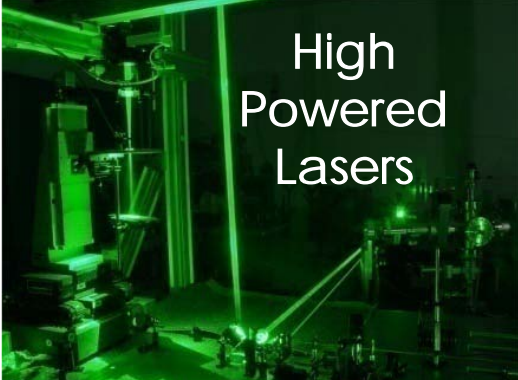
Surveillance
and
Reconnaissance



Urban Maglev



Power
Conversion



High
Powered
Lasers

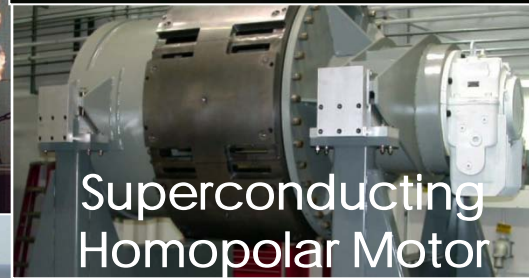


Railgun

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Radar Systems
and
Imaging



Superconducting
Homopolar Motor



Energy
Storage



Plastic
Biodiesel

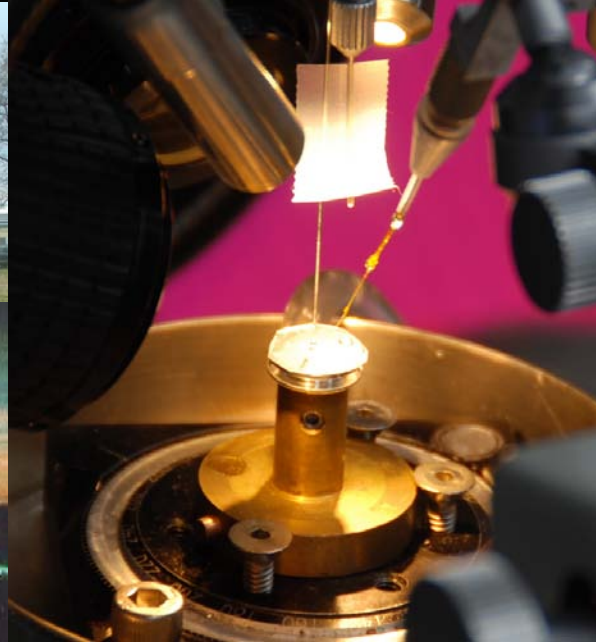
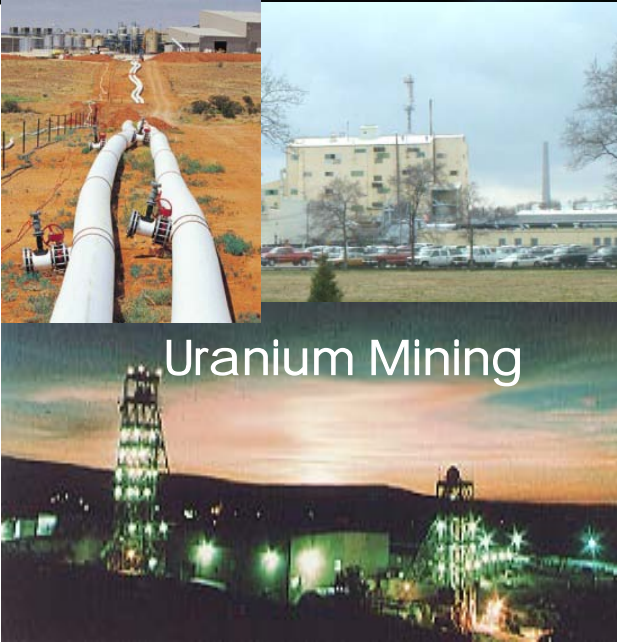
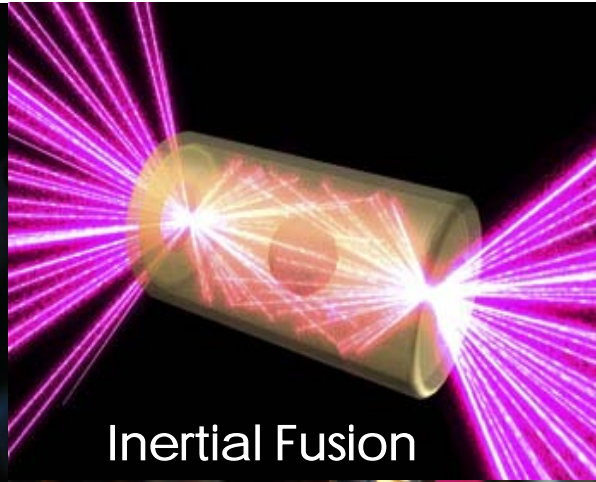
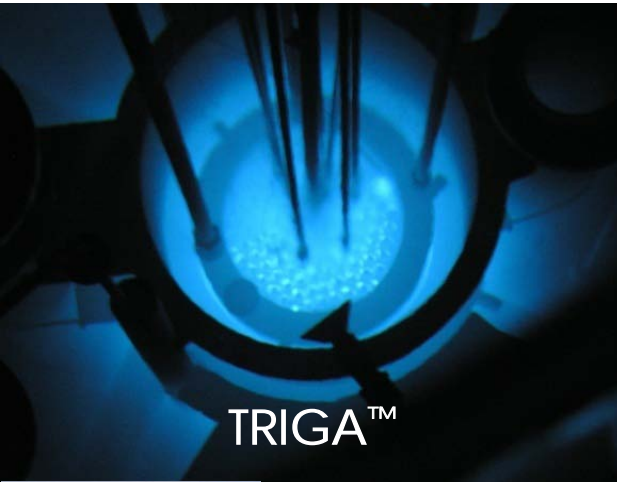


Hybrid Electric
Drives



Microalgae
Biofuels

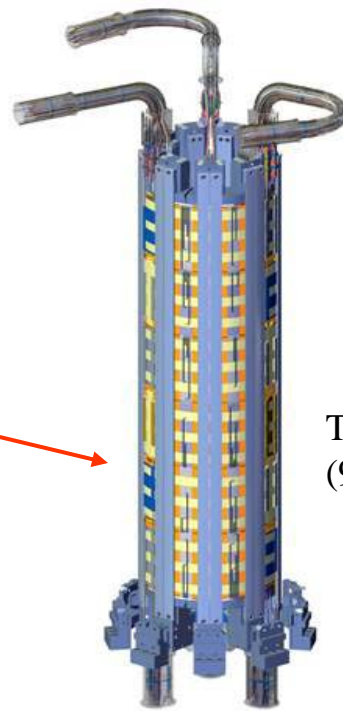
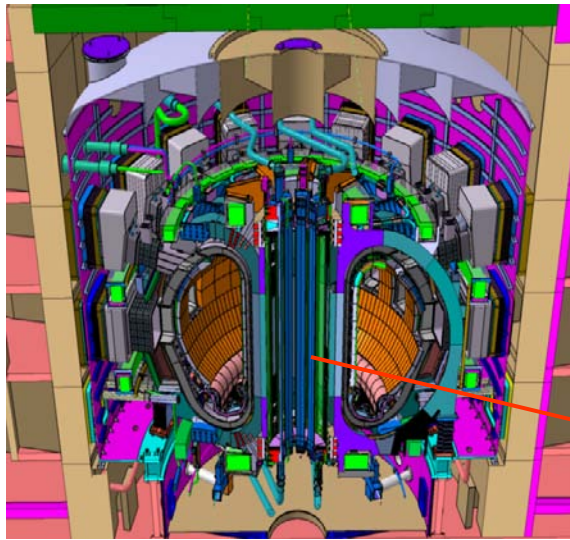
GA's Major Nuclear Technologies Programs



General Atomics Magnetic Fusion Activities Are Focused on Providing Solutions to Key ITER Issues

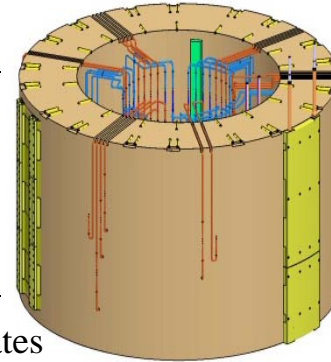
- **DIII-D Program's primary research objective is support of ITER**
 - 60% of research aimed at specific ITER issues
 - Actively engaged with ITER in prioritizing research
- **Providing key information on resolving critical issues of ITER design**
 - ELM control – preventing high transient heat loads
 - Disruption mitigation – safe plasma quenching
 - Operating scenarios – minimum S/C coil requirements
 - Specific ITER requests – e.g., fusion performance impact of Test Blanket Modules (TBMs)
- **GA is supporting ITER construction efforts and Eng/Scientific analysis**
 - Develop prototypes for microwave components, plasma control and data archiving
 - Physics support - simulate/analyze plasma disruption mitigation, ELM control, etc.
 - Fabricate 7 CS Modules

GA Under Contract to Manufacture ITER Central Solenoid Modules

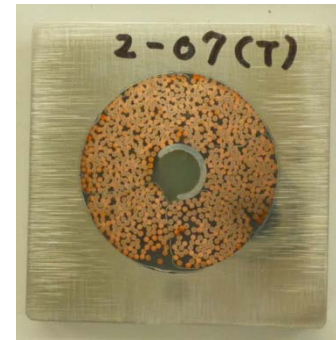
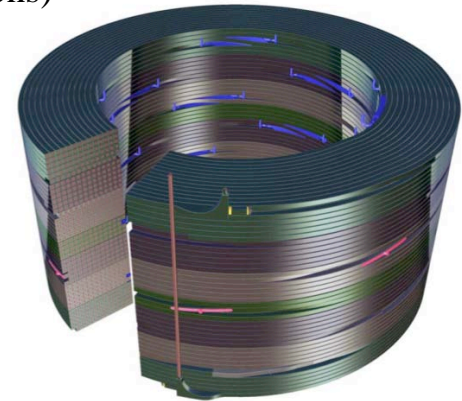


Upper feeders
(cryo, electrical connections)

2 m



Tie plates
(9 inner, 18 outer)



50 mm sq.

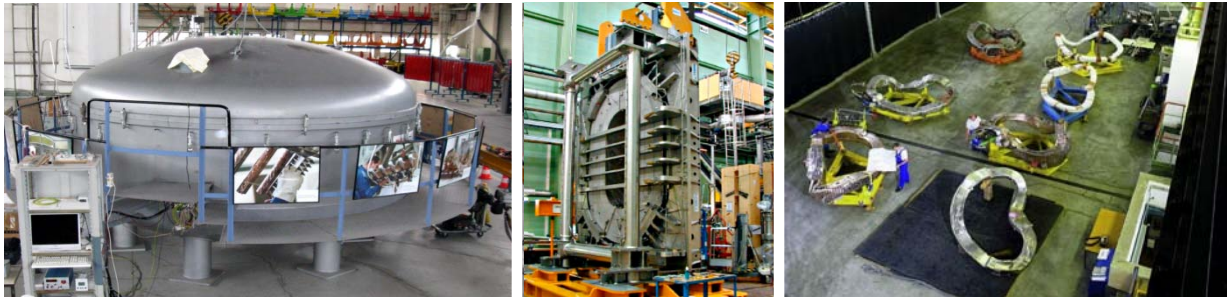
- Six modules plus structure ~900 tonnes
- Each module weighing 110 tonnes has 560 turns (6.5km of conductor)
- Nb₃Sn CICC Conductor supplied by JAEA in 1km lengths

Experience Uniquely Prepares GA Team to Manufacture the CS Modules

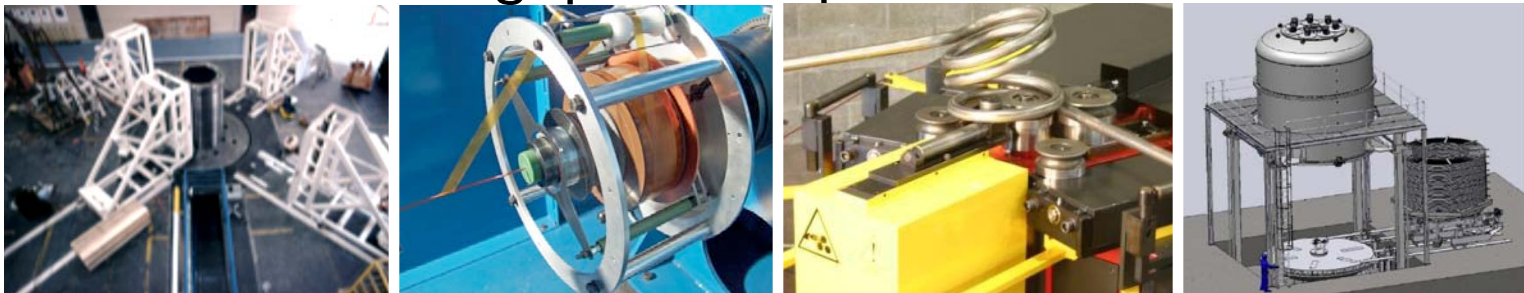
- GA: CS Model Coil, EMALS, DIII-D, Maglev, Homopolar Motor



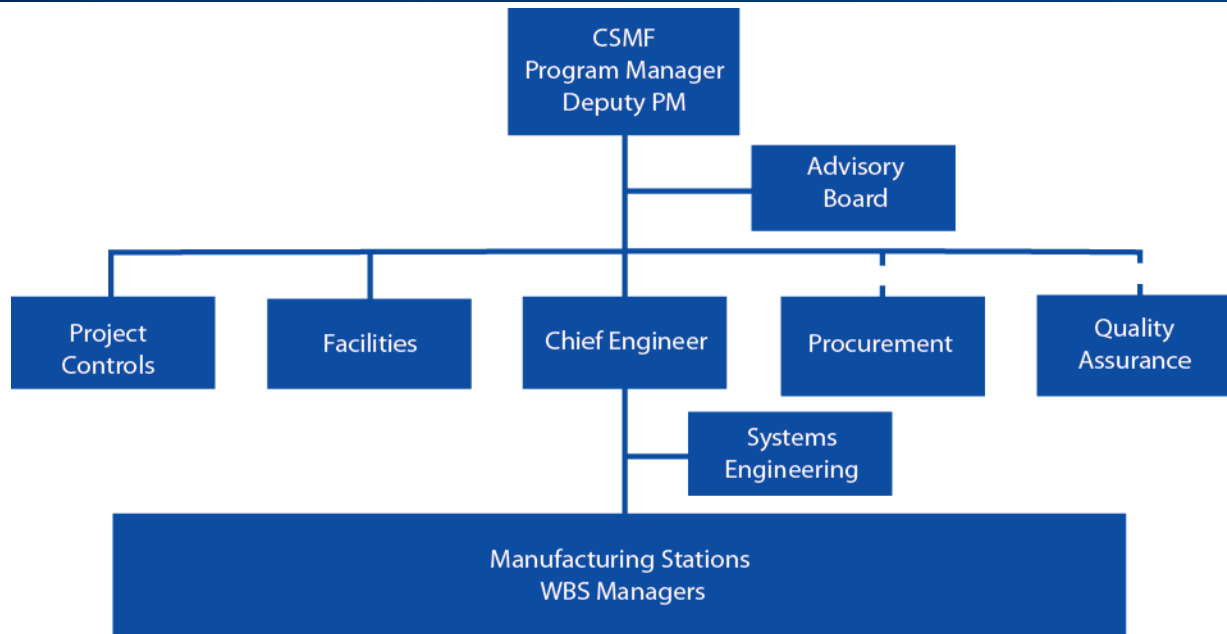
- Babcock Noell: W-7X Coils, TF Model Coil, LHC magnets, ITER Dipole



- Subcontractors bring specific expertise

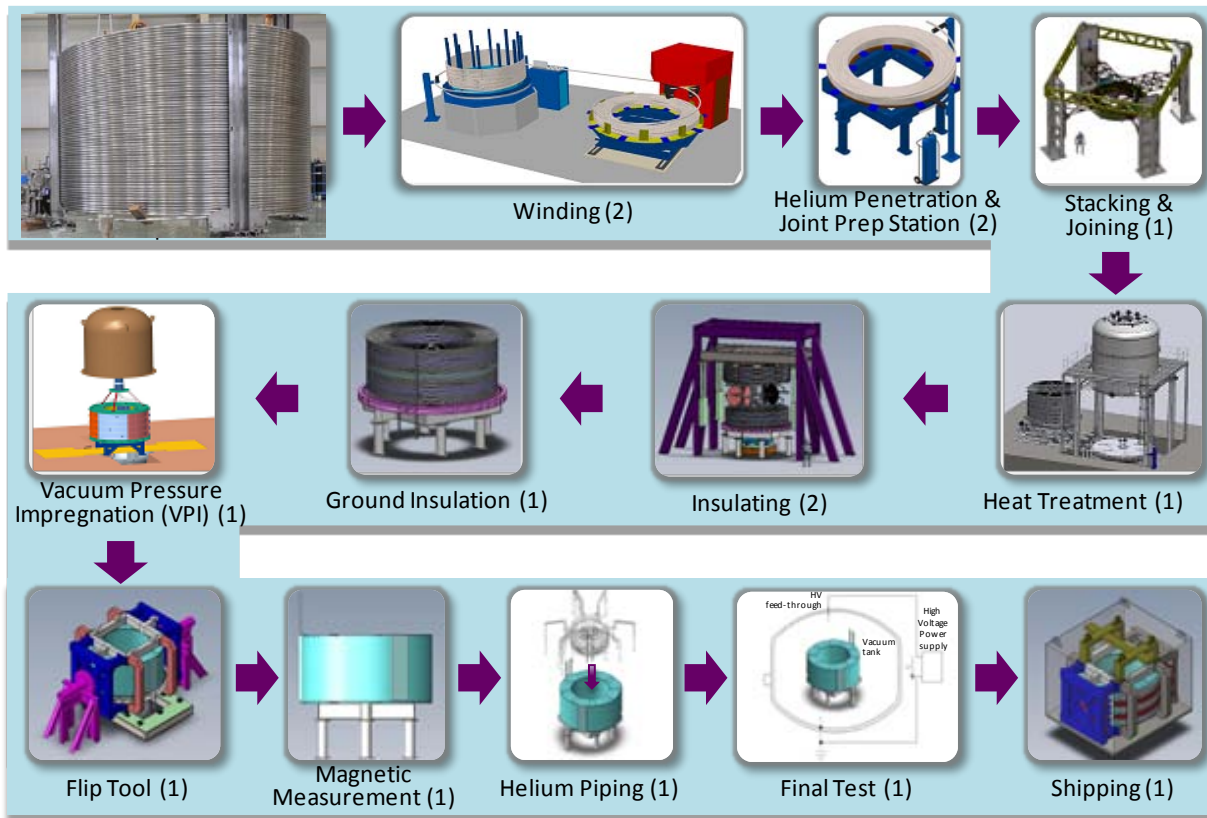


Key Management Team Assembled to Successfully Manage CS Module Fabrication (CSMF) Program



- Project management approach couples proven techniques with proven technical managers
- Many individuals have CS Model Coil experience
- Team has access to subject matter experts through out GA
- Earned Value System used to manage project with established WBS
- Conservative resource-loaded schedule created to meet or beat delivery milestones

Integrated Baseline Manufacturing Process Defined for Manufacturing CS Modules



- Manufacturing process concept developed for all stations
- Risks identified and strategies to reduce risk developed
- Manufacturing development program defined to reduce risks

ITER CS Fabrication Program Up and Rolling

- Fabrication of CS modules is planned, manned and underway
- Team has necessary experience and capability
- GA is corporately committed to supporting the success of ITER