



**FUSION
FOR
ENERGY**

6th ILO meeting

**CFTs coming soon
(1st quarter 2010)**

02nd February 2010 - Barcelona

WP 2010: 175 calls (99 CFTs and 76 grants) for >600 M€

Procurements 1st half 2010: 67 Contracts of which 13 Framework Contracts
for a total value of more than 250 M€. (22 contracts above 1 M€)

First quarter: 44 procedures, among which 16 procedures > 1 M

Grants: 52 Grants agreement ; **First quarter:** 28 Grants

Following slides: Blue for Procurements; Red for Grants

BOLD for Procurements > 1 M€ & Grants > 200 k€

Italic for contracts launched after last ILO meeting

Magnets:

- Strand qualification phase tests (N)
Aim: quality control for NbTi strands candidature evaluation.
Specific skills required: cryogenic measurements in variable temperature & micrographic geometrical analyses
- SC Dummy conductor manufacturing (N)
Aim: provide highly-relevant dummy conductor for TF winding trials
Specific skills required: metallic strand cabling; tube soldering; multistrand cable jacketing compaction



- Strand production control tests (N)

Aim: quality control for NbTi strands production evaluation.

Specific skills required: cryogenic measurements in variable temperature;
cryogenic measurements in variable magnetic field; micrographic
geometrical analyses

Site & Buildings:

- **Architect Engineer (N): LAUNCHED**, the restricted procedure was cancelled because it did not allow F4E to define accurately contractual specifications. A negotiated procedure was launched. The award decision may be given by February-March 2010.
- **INSURANCE**: Support for (N) + Mandatory & Complementary insurances (R): F4E and IO will subscribe an insurance for all activities on site to cover themselves and contractors from material damages (IO CFT).
- **Site adaptation (N)**: end 1st quarter
- **Tokamak Complex Sismic isolation Pit (O)**: (it includes pre-excavation, excavation, retaining walls, and base mat). The procedure is launched again for technical reason linked to ground-water (new Tech. Spec from IO).



- **Anti Seismic bearings (na): we are still considering the procurement strategy.** We target mid 2010.
- **Support for General Safety and Health Coordination for ITER buildings (N):** technical specifications on-going;



Magnets: . Poloidal Field Coils PF2 to PF6 –Tooling (O): LAUNCHED or very soon : aim: 5 ITER Poloidal Field coils (PF2 to PF6), which will be manufactured in the PF Coil building at the Cadarache site.

- **Procurement for Testing of TF Nb3Sn Strands (O);** Two supply contracts awarded to OST and Bruker EAS (& responsible for the standard testing during production). But F4E requested to carry out independent measurements for about four years duration. skills: lab. or Cies equipped with high field, small bore magnets capable to perform these measurements
- Detailed design of test facility (O); Preliminary layout of the test facilities; Preliminary design of the cryostat, cryoplant and auxiliaries to be used for the tests; Preliminary cost assessment for the installation of the facilities and testing of the TF and PF coils skills: companies in the field of cryogenics and cold test equipment, or equivalent mechanical/vacuum companies

Vacuum Vessel: Procurement of Main Vessel - Manufacturing Design, Mock-ups and Sector 5 Material (N) (5th February)

- CAD Models & Drawings for main sector manufacturing (ESC task)

Blanket: Continuation of Be/CuCrZr HIP joining development + High heat flux testing of FW mock-ups before and after irradiation, including transportation

Divertor: Manufacturing of mock ups and prototypes for the full W divertor (N): several contracts; very limited capable companies and sub. Cont.

Remote Handling: Engineering Support (ESC task)

Material Development (2 O): EUROFER TBM design rules: 1 for welds rules & 1 for High temperature rules.

- Design rules for EUROFER (Creep-fatigue)
- Characterization and validation of EUROFER and EUROFER welds for TBM use.
- EUROFER base materials & welding for TBM use: Irradiation campaigns. Characterisation and validation

Test Blanket modules: Development of fabrication procedure specifications. Fabrication of TBM box components feasibility/test mock-up (O)

- Contract for Engineering Supp. to TBM Preliminary Safety Report (ESC task)
- Engineering support to TBMs / TBM mock-ups fabrication, systems integration in ITER, (RH) support equipment, etc. (ESC task)

Test Blanket modules:

- HCLL/HCPB TBMs Preliminary Safety Report (PrSR), complementary analysis
- Follow-up and support to the HCLL/HCPB Preliminary Safety Report (PrSR)

Cryoplant: signature of the PA with IO planned for December 2010; nowadays, analysis of the market & evaluation of the strategy and best contractual options

Vacuum & Tritium group:

- (vac) Detailed design and specification for the Cold Valve Boxes and cryojumpers (O); completion of simulation of performances (heat load & thermodynamics characteristics) skills: good analytical capability on thermodynamic and fluid simulations, & good understanding of IO vacuum system and operation parameters/requirements.
- **Optimisation and performance studies for leak detection system including proof-of-principle tests. Review of leak localization concepts and their possible realization**
- **(tri)** mechanical analysis: Conceptual design of emergency tanks for Water Detritiation System (WDS) (ESC task);
- (tri) Conceptual and detailed design of WDS (N)

Heating System & Current drive:

- (CODAC) Review of ITER I&C specifications (N)
- (EC PS) Procurement for mirrors for RFCU (N)
- (EC UL) EC UL prototypes (N); **Detailed design, analysis, testing and documentation**
- (IC H&CD) ICH Antenna R&D: Vacuum Window (N)
- (Neut. Beam) Ion source test facility (power supplies - HVD and TX Line) +
- 2 contracts for engineering support among which one in Cost & Schedule and Tech Specs Revision (both ESC tasks).

Diagnostics:

- Supplies and Support for Design of In-Vessel Diagnostics and Port Plugs (O): 5 lots
- 4 Complete Design of in-vessel Diagnostics to Conceptual Design Review level for:
 - Bolometers
 - Plasma position reflectometers
 - Pressure Gauges
 - In-vessel services
- Support for Finalization of Technical Specifications for Port-based Diagnostics
- Development of design solutions for optimising first mirror lifetime
- Complete Design of port plug-based Diagnostics to Conceptual Design Review level

Plasma Engineering:

- Study of plasma start up
- Study of control of plasma current, position and shape
- Self-consistent simulations of plasma scenarios
- Edge magnetic field structure for ELM control in ITER and associated power/particle fluxes to plasma-facing components
- Ripple analysis and characterization of effects in ITER

Engineering support:

- Fusion component failure rate database (N)
- Deuterium Desorption from Be layers (N)
- Electromagnetic analyses
- Mechanical analyses
- (safety) Grant for Prevention & Mitigation of In-Vessel Hydrogen/Dust Explosion - Phase II (Combined H₂/Dust explosion computer code development)

Project office:

- **Framework contract for project planning support (O);** Framework contract for planning & scheduling specialised services for the optimization of the F4E Primavera system and the improvement of related best practices
- **Quality insurance: Service of inspectors for ITER project contracts follow-up; resident, itinerant & spot surveillance at suppliers' premises; skills:** technology and metallurgy of welding processes, thermal treatment, non destructive examination methods, technology of fibre reinforced materials for high temperature application, measurement of composite material properties, quality control.

Conclusion



- Activity on buildings and main components (VV, TF& PF Coil) has started.
- Rhythm of activity permanently accelerating
- More than before, need of interaction with ILOs (ex. SMEs)