



**FUSION  
FOR  
ENERGY**

# **Fusion for Energy The European Domestic Agency for ITER**

## **4<sup>th</sup> ILO Meeting**

**Philippe Corr ea  
July 8<sup>th</sup> 2009 - Barcelona**

# Agenda



1. Update on Procurement & Grants activity
2. Work programme 2009 amendment
3. Legal topics

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# Procurements



Committed contracts	K€	Volume
WP2008	4 345	5
WP2009	2 576	10

Awarded procedures	K€	Volume
WP2008	67 302	7
WP2009	0	0

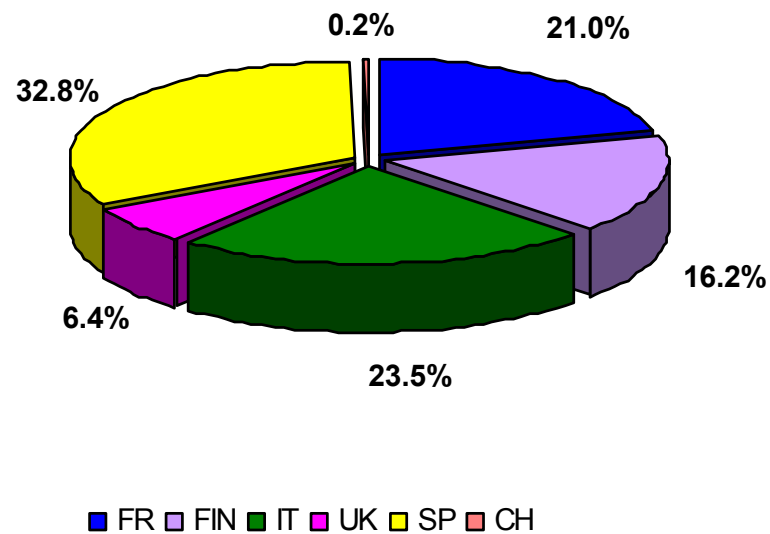
In progress	K€	Volume
WP2008	9 800	1
WP2009 P1 <i>(12/2008 version)</i>	241 592 <i>(165 540)</i>	10 <i>(11)</i>
WP2009 P2 <i>(12/2008 version)</i>	177 400 <i>(90 000)</i>	2 <i>(2)</i>

# Procurements



Contrats notifiés par F4E

(source : F4E)



# Grants



Committed agreements	K€	Volume
WP2008	4 345	5
WP2009	2 576	10

Awarded agreements	K€	Volume
WP2009	1 906	8*

In progress	K€	Volume
WP2009	13 053	14

\* of which 4 also included in WP/budget 2008

# Grants Planning



Grants planned in WP2009		K€	Volume
WP2009 version 12/2008	P1	38 096	83
	P2	20 602	39
	<i>Total</i> <i>(of which planned by June 30<sup>th</sup> )</i>	<i>58 698</i> <i>30 315</i>	<i>122</i> <i>75</i>
WP2009 version 7/2009	P1	31 603	59
	P2	24 669	45
	<i>Total</i> <i>(of which planned by June 30<sup>th</sup> )</i>	<i>56 272</i> <i>19 709</i>	<i>104</i> <i>38</i>

Actual progress on June 30 <sup>th</sup>		K€	Volume
		17 535	32
	% on WP2009 12/2008	57%	43%
	% on WP2009 7/2009	89%	84%

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1. Update on Procurement & Grants activity
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# Introduction 1



**Main modifications in the Work Programme 2009 are due to:**

**1. Design still in progress:**

- Vacuum Vessel and In-vessel components (Blanket, First Wall and Divertor)
- Leak Detection and Leak Localisation
- Vacuum Pumping
- Cryopump
- Tritium Plan
- ISS
- Ion Cyclotron

**Main modifications in the Work Programme (WP) 2009 are due to:**

## **2. Pending decision on Scenario 1:**

- **1st plasma without in-vessel components in 2018**
- **Deuterium-Tritium experiments in 2026:**
  - ✓ **Time schedule is relaxed for**
    - ✓ **installation of Blanket, First Wall, Divertor, Heating and Current Drive Systems, Test Blanket Modules and a number of diagnostics with respect the previous schedule (scenario 0);**
  - ✓ **Critical timing for**
    - ✓ **Magnet Coils, Vacuum Vessel, Buildings**
    - ✓ **the procurement contracts have to be launched as soon as the designs are defined and Procurement Arrangements are signed;**

# Introduction 3



## Some F4E activities are dropped:

- **Because IO decided to launch direct contracts**
  - ✓ In the area of CODAC, Neutral Beam Injection (NBI)
- **Because IO has cancelled the activity**
  - ✓ Vacuum Pumping: validation of conductance code

## Some F4E activities are postponed:

- **waiting for the results of previously launched activities and on-going tasks:**
  - ✓ e.g Remote Handling

## Some F4E activities are re-organized:

- **in order to optimize procurement strategy**
  - ✓ Tritium Plant, Ion Cyclotron, Diagnostics
  - ✓ or internal resources (Electron Cyclotron, NB)

# Procurement Arrangements



WBS	Title	Previous Signature Date	New Signature Date
1.1.3A+ 1.1.3B	Poloidal Field Coils PF2 to PF6	January 2009	June 2009
1.1.2A1	Magnet Structures: Pre-compression Rings	May 2009	September 2009
1.1.P6C	Poloidal Field Magnet Conductors	Not present in WP2009	May 2009
1.5.1.A	Vacuum Vessel Sector Production	January 2009	September 2009
1.7.2B	Divertor Inner Vertical Target	February 2009	December.2009
1.7.1	Divertor Cassette and Integration	July 2009	June 2011
2.3.5	Neutral Beam Remote Handling	November 2009	TBD <sup>l</sup>
5.3.6	Procurement of NB power supplies and related systems	2008	July 2009
5.5	All Procurement Arrangements for diagnostics (not yet defined)	July 2009	Sept 2010
6.2.P2.EU.02	Architectural and Engineering Services	January 2009	May 2009
6.2.P2.EU.03	Tokamak pit excavation and drainage	January 2009	May 2009
6.2.P2.EU.04	Seismic Isolation Pads & Assembly Hall Cranes	January 2009	May 2009
6.2.P2.EU.05	ITER Buildings	October 2009	Nov 2009
	ITER Office Building Annex	?	?

# Magnets 1



## Procurement Arrangements:

WBS	Title	ITER Credit (klUA)	Signature due
1.1.3A+ 1.1.3B	Poloidal Field Coils PF2 to PF6	41.4	June 2009
1.1.2A1	Magnet Structures: Pre-compression Rings	0.6	Sept 2009
1.1.P6C	Poloidal Field Magnet Conductors	11.2288	May 2009

- **TF windings (priority 2):**

**2 options to optimise the costs have been proposed in the call for tender:**

- ✓ to manufacture 10 windings;
- ✓ to manufacture 5 windings.
  - ✓ In both cases the supplier has to evaluate the number of manufacturing parallel lines needed to respect the schedule.
  - ✓ If the 5 windings solution is more convenient, 2 contracts will be launched in parallel and each of them will include in the 1st phase the manufacture of a full-size dummy double pancake and the tooling for the subsequent production.

# Magnets 3



## TF and PF cabling and jacketing (priority 1):

This call for tender includes:

- a PF conductor sample (pre-qualification before the production),
- the jacketing of PF1 and PF6 cable lengths from RF (compensated by NbTi cables not purchased by EU). *Agreement in line with the ITER Council recommendation to review the sharing reducing risks/costs of ITER components when possible.*

## Additional Design and R&D Procurement and Grants (priority 2):

- ✓ Testing of TF strands during production;
- ✓ Manufacturing and testing of TF and PF samples in SULTAN.

# Vacuum Vessel 1



## Two designs are under investigation:

1. Alternative design (shielding and FW detached from the VV)
2. Modified Reference design.

### Both designs intend to:

- simplify the VV Baseline Design
- solve open technical issues and reduce risks and costs.

Final decision is planned in July 2009.

Assuming that the chosen design introduces « irrelevant » modifications to the « Reference Design »

- the P.A. can be signed in September 2009
- Call for Tender for construction of vessel sectors launched in Q4
- The number of contracts is not yet defined in consideration of the parallel fabrication lines needed.
- The procurement of the material will be included in the main contracts.

# Vacuum Vessel 2



## **Due to tight schedule**

« sector 5 » will not be built as « first of a kind » but as « Demonstrator »

« sector 5 » is now planned to reduce the risk in the fabrication of the 7 sectors.

**Possibility of a new sharing.** Recently, Korea agreed to discuss with the EU on the possibility to optimize the sharing and reduce risks and costs...

- One option is 9 segments KO, 27 segments EU plus the fabrication of the final sectors.

# Site and Buildings 1



## Procurement Arrangements:

WBS	Title	ITER Credit (klUA)	Signature due
6.2.P2.EU.02**	Architectural and Engineering Services	54.7	May 2009
6.2.P2.EU.03**	Tokamak pit excavation and drainage	31	May 2009
6.2.P2.EU.04**	Seismic isolation Pads & Assembly Hall Cranes	6.2	May 2009
6.2.P2.EU.05**	<b>ITER Buildings</b>	<b>273.2</b>	<b>Nov 2009</b>
<del>6.2.P2.EU.06**</del>	<del>East Buildings</del>	<del>228.71</del>	<del>Oct 2009</del>
<del>6.2.P2.EU.07**</del>	<del>West Buildings</del>	<del>36.48</del>	<del>Oct 2009</del>
	ITER Office Building <b>Annex</b>	<b>14.4</b>	

\*\* F4E and IO have tentatively agreed a new subdivision of the Procurement Arrangements related to the ITER building construction

# Site and Buildings 2



- **The pre-excavation** activities have been included in the procurement related to the Excavation;
- **Two new procurements** are included in the amended WP2009:
  - ✓ **Construction insurance (priority 1).**
  - ✓ **Adaptation of site before starting construction (priority 2)**

# Blanket and First Wall



## Design of Blanket and First Wall depends strongly on VV design decision

With Scenario 1 there is more time to define the in-vessel components because they will be installed in the machine after the 1st plasma

- With the Modified reference design, progress has been made to improve the shielding capacity in the inner side of the VV.
- Concerning Alternative design, some analyses are still in progress.
- In both cases more design activities are needed in 2009 and consequently the pre-industrialization activities have been dropped and are estimated to be launched in 2010/2011.

- **The signature of the P.A.s has been delayed to wait for the final design of the VV.**
  - no impact on the schedule because the divertor will be installed after the 1st plasma in 2018.
  - As a consequence, the procurement for the fabrication of the Inner Vertical Target Prototype has been dropped and it is now estimated to be launched in 2010.

- **A number of activities related to Remote Handling (RH) are dropped and now planned to be launched in 2010 or 2011**
  - due to some delay in the results of corresponding grants
  - due to discussion with IO to define the RH strategy with respect to construction of test facilities;
- **A new grant is proposed to continue the R&D activities in the existing DTP-2 facility.**

# Vacuum Pumping and Fuelling



- **The main modifications are:**
  - ✓ A new grant and an existing one were included in the list of « voluntary ITER urgent tasks » approved in 2008 by the ITER Council (at present are not credited);
  - ✓ Activities dropped waiting for input from ITER Organization (2 grants and 2 procurements) – estimated launch in 2010;
  - ✓ One grant dropped by ITER.

- One procurement related to the production of « Process flow diagram » and « Process and Instrumentation diagram » has been included in the grant related to the preliminary design of ISS and WDS;
- Two grants and one procurement have been dropped and are now planned to be launched in 2010 waiting for input from IO.

- **One grant and one procurement related to « Technical support for the definition and design of CODAC » have been dropped because IO will not issue any call for tender to the DAs in 2009.**



- **ICRH antenna:**

The activities have been regrouped according to RF vacuum windows R&D and Faraday Screen R&D.

- **ECRH:**

- ✓ one grant in priority 1 has been added to guarantee continuity on the design development of EU Gyrotron;
- ✓ the procurement of 2 MW, CW dummy load has been dropped and it is estimated to be launched in 2010;
- ✓ the procurement of a spare CVD window has been included in the procurement of Refurbishment of the 1st prototype of the 2 MW gyrotron.



- **Neutral Beam:**
  - ✓ the Procurement Arrangement of the NB Power sources included in the ITER baseline is planned to be signed in July 2009 and the procurement will be launched immediately after;
  - ✓ the service contract for ELISE, in addition to the preparation of the facility, is including now also the experiments;
  - ✓ a procurement on manufacturing technologies has been postponed in 2010 due to limited resources to prepare the technical specification (no impact on the schedule);
  - ✓ a procurement on R&D on large metal seal has been stopped because the activity was launched by IO with the direct placement of a contract.

- **A number of activities in support to F4E for the preparation of the Diagnostic Procurement Arrangement have been anticipated from a Grant in priority 2 to a Grant in priority 1;**
- **A new procurement based on a framework contract is proposed to replace five separated procurements, with the objective of including similar activities in the same framework contract.**

- **ITER Site Support:**

Obligation of F4E to contribute in cash to CEA for the reimbursement of the costs related to « Site support to the ITER Organization ». The site support activities in 2009 include the construction of the office building JWS3 for the F4E antenna in Cadarache.

- **Experts:**

Support from experts to F4E with a ceiling of 2800 days in 2009.

- **Urgent Activities in Support to IO:**

- ✓ Achievement of baseline design (as the design of VV);
- ✓ Cost estimation for some specific systems.

# Summary of the WP09 Budget (in M€)



Budget	Activities	Grants	Procurement	Cash
3.1+3.5	Main Procurements in support of ITER	-	220.24	-
3.1+3.5	Contribution in Cash to CEA for ITER Site Support	-	-	7.8
3.1+3.5	Contribution in cash in support of ITER	-	-	25.0
3.1+3.5	Contribution in cash for transfer of procurements to Japan	-	-	29.2
3.1	Design and R&D in support of ITER, Credited by ITER	3.5	2.6	-
3.6	ITER task agreements, Credited by ITER	25.1	12.1	-
3.1 +3.5+ 3.6	Total ITER Construction		325.8	
3.2	Design and R&D in support of ITER (incl. Materials Development, TBM, nuclear data), Not credited by ITER	3.9	10.3	-
3.2	Technology for ITER and DEMO		14.2	

# Summary of the WP09 Budget (in M€)



<b>3.2</b>	<b>Technologies for ITER and DEMO</b>		<b>14.2</b>	
<b>3.3</b>	<b>Activities in support of Broader Approach</b>	-	<b>10.000</b>	-
<b>3.3</b>	<b>Contribution to the Common Expenses of the IFMIF-EVEDA Project Team</b>	-	-	<b>0.210</b>
<b>3.3</b>	<b>Technology for Broader Approach</b>		<b>10.210</b>	
<b>3.4</b>	<b>Appointment of Experts for Technical Assistance to F4E</b>	-	-	<b>1.54</b>
<b>3.4</b>	<b>Other Expenditure</b>		<b>1.54</b>	
<b>3</b>	<b>Total operational expenditure</b>		<b>351.75</b>	

# Agenda



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# Background



- The present basis for F4E's existing terms and conditions is issued from the European Commission's General Conditions and EFDA.
- Ongoing review of F4E's standard contract terms and conditions.
- Feed-back from industry are taken into consideration.
- However, deviations from current terms and conditions are likely to lead to rejection of tender.
- Revised terms and conditions to be defined by end 2009.

# Liability policy



## Up to now



- Scenario with unlimited liability + variant with capped liability considered unsatisfactory
- Unlimited liability for consequential damages
- Nuclear liability treated as general liability

## New approach



- Cap on Contractor's liability can be proposed as a basic scenario according to a risk assessment
- Cap on consequential damages
- Exceptions: e.g. in cases of gross negligence or wilful misconduct, personal injuries, non compliance with law
- Nuclear liability treated separately

- Some items under F4E procurement responsibilities for ITER have dual-use purpose: civil and military
  - subject to export control requirements
  - authorisation procedures for export are lengthy and could delay ITER project
  - F4E needs to identify these items early and ensure compliance with export requirements
- F4E requires suppliers' support as follows:
  - identify these items in their tender documentation
  - include in their tender documentation a list of dual-use items
  - by indicating the category based on applicable international export control lists.
- F4E is looking for an expert in export control to support the identification of dual-use items under F4E procurement responsibilities (see call for expression of interest published on F4E website) .

Variant is an equivalent alternative proposed by tenderer to F4E model solution as part of a procurement procedure

- Contract notice/tender docs:
  - F4E must indicate whether variants are authorised or not
  - F4E specifies minimum requirements to assess equivalence of alternative solution proposed by tenderer. These may be lower/upper limits regarding performance or functional requirements
  - E.g. tenderers may be allowed to propose alternative material for a conductor provided electric resistance remains within the specified limits which F4E considers equivalent to its “model solution”.
- F4E assesses the compliance of variant with minimum requirements.
- If variant complies, it will be considered.

Options are extras information that F4E is entitled to request as part of a procurement procedure

- What? – Supplement to main contract re.
  - Quantitative extras (e.g. order of additional units, contract prolongation)
  - Qualitative extras (e.g. additional functions of a machine)
- How?
  - F4E specifies option in contract notice/tender docs, indicating whether or not a bid for the option will be taken into account in evaluation for award of overall contract;
  - Exceptionally, value of option may exceed 50% of value of base contract if best solution;
  - Tenderers should be obliged to bid for the option;
  - The bid for option must be taken into account for the evaluation;
  - Contract for option is definitively formed if/when F4E requests contractor to execute the option.



- Fusion for Energy and ITER Organization agreed to launch a joint procurement
  - for a global insurance policy
  - to cover construction of ITER buildings and erection of ITER device
- The Insured :
  - ITER Organization,
  - The ITER Members,
  - The Domestic Agencies,
  - The contractors, the subcontractors of any tiers, the suppliers and/or consultant (in respect of their site activities only).



- **Scope: all works in connection with:**
  - Design
  - Construction
  - Commissioning
  - Ownership
  - Maintenance of the ITER plant in Cadarache (France), and
  - all ancillary and associated works in connection therewith
- **Period:**
  - from 1st January 2010 up to the end of the project according to the present schedule
- **Insured property:**
  - permanent and/or temporary works, material supplies, goods and any other property, for which the insured is responsible, intended for use in connection with, or for incorporation in the works by the insured.
- **Benefit:**
  - to indemnify the insured in respect of physical loss or damage to the insured property occurring during the period
  - to indemnify the insured for their liability arising from their activity in the project.