



FUSION FOR ENERGY

The European Joint Undertaking for ITER and the Development of Fusion Energy

THE GOVERNING BOARD

DECISION OF THE GOVERNING BOARD ADOPTING THE THIRD AMENDED 2010 WORK PROGRAMME OF THE EUROPEAN JOINT UNDERTAKING FOR ITER AND THE DEVELOPMENT OF FUSION ENERGY

THE GOVERNING BOARD OF FUSION FOR ENERGY

HAVING REGARD to the Statutes annexed to the Council Decision (Euratom) No 198/2007 of 27th March 2007 establishing the European Joint Undertaking for ITER and the Development of Fusion Energy (hereinafter "Fusion for Energy") and conferring advantages upon it¹ and in particular Articles 6(3)(d) and 11 thereof;

HAVING REGARD to the Financial Regulation of Fusion for Energy² adopted by the Governing Board on 22nd October 2007, last amended on 18th December 2007³ (hereinafter "the Financial Regulation"), and in particular Article 64 thereof;

HAVING REGARD to the Implementing Rules of the Financial Regulation⁴ adopted by the Governing Board on 22nd October 2007 last amended on the 8th July 2008⁵ (hereinafter "the Implementing Rules") and in particular Article 53 thereof;

HAVING REGARD to the Fusion for Energy 2010 Work Programme adopted by the Governing Board on 27th November 2009 and amended on 31th March 2010 and 10th June 2010;

HAVING REGARD to the Fusion for Energy Project Plan and Resource Estimates Plan adopted by the Governing Board on 26th November 2009;

HAVING REGARD to the comments and recommendations of the Executive Committee and Technical Advisory Panel during their joint meeting on 11th November 2010;

WHEREAS the Director should, in accordance with Article 8(4)(c) of the Statutes, draw up an annual work programme for adoption by the Governing Board on the basis of comments and recommendations from the Executive Committee and the Technical Advisory Panel;

¹ O.J. L 90, 30.03.2007, p. 58.

² F4E(07)-GB03-11 Adopted 22/10/2007

³ F4E(07)-GB04-06 Adopted 18/12/2007

⁴ F4E(07)-GB03-12 Adopted 22/10/2007

⁵ F4E(08)-GB06-06a Adopted 08/07/2008



HAS ADOPTED THIS DECISION:

Article 1

1.1. Under WBS 1.5 - VACUUM VESSEL, second paragraph of *Summary* is replaced by:

“WP2010 activities are focused on engineering design, validation mock-ups, tooling and materials. In addition, the manufacturing of the “first-of-a-kind” sector (sector 5) will be initiated.

The stainless steel material for sectors 5, 4 and 3 will be procured: the joint release of material purchase stages for multiple sectors will simplify the logistics of material procurement, reduce the risk of having dissimilar properties for the various material batches; furthermore the purchase will reduce F4E’s exposure to fluctuations in the stainless steel market.

Forming and cutting of plates and forgings of sector 5 will be started: it is foreseen that ANB will authorise early in 2011 the fabrication of the sector, furthermore plate cutting can start even before ANB authorisation; therefore, the release of these activities by F4E in 2010 will introduce some schedule contingency.”

1.2. Two additional rows are added to the table in section 2.2.4. – List of Activities as follows, the related budget adjustments are included in the Appendix II summary table:

WP ref	ITER WBS/PBS	Activity Type	Activity Title	Duration of contract (months)	Credit Status	Time of Call
WP10/15/09	1.5.1	P supply	Procurement of Main Vessel – Material Procurement for Sector 3	54	Y	10Q1
WP10/15/10	1.5.1	P supply	Procurement of Main Vessel – Material Procurement for Sector 4	54	Y	10Q1
WP10/15/11	1.5.1	P supply	Procurement of Main Vessel – Manufacturing of Sector 5	54	Y	10Q1

1.3. Under WBS 6.1 – SITE and WBS 6.2 – BUILDINGS, *Summary* is replaced by:

“Within WP2010 activities the Architect Engineer will develop the design of the buildings from the conceptual design to a design stage detailed enough to allow issuing the call for tender for the construction of the civil engineering part of the Tokamak Complex. Contractors will prepare the site and the Tokamak pit to allow for the beginning of the Tokamak Complex civil engineering construction.

In addition, the second phase of Architect Engineer activities will be initiated: this will allow for anticipation of certain works on site, and therefore for the increase of schedule contingency in the project plan. Furthermore this will have the additional advantage of a more continuous involvement of the Architect Engineer site team, therefore slightly reducing the cost to F4E (no partial de-mobilisation and remobilisation of the site team will be needed)."

1.4. One additional row is added to the table in section 2.15.3. – List of Activities as follows, the related budget adjustments are included in the Appendix II summary table:

WP ref	ITER WBS/PBS	Activity Type	Activity Title	Duration of contract (months)	Credit Status	Time of Call
WP10/62/08	6.2	P service	Architect Engineer - Subsequent services	72	Y	2009

Article 2

The following activities are cancelled from the 2010 Work Programme, the related budget adjustments are included in the Appendix II summary table:

WP ref	Area	Activity Title
WP09/16/02	Blanket	Continuation of Be/CuCrZr HIP joining development
WP09/55/02	Diagnostics	Complete Design of in-vessel Diagnostics to Conceptual Design Review level
WP09/55/23	Diagnostics	Support for Finalisation of Technical Specifications for Port-based Diagnostics
WP09/56/06	Test Blanket Modules	HCLL/HCPB TBMs Preliminary Safety Report (PrSR)
WP09/62/03	Sites & Buildings	Support Study for Accidental Scenarios
WP09/SF/06	Safety	Supporting safety analysis to follow up ITER design evaluation and licensing process
WP09/SF/11	Safety	The ALARA application to Occupational Radiation Exposure based on ITER design evolution
WP10/16/03	Blanket	Continuation of technology development for enhanced first wall design (5MW/m ²)
WP10/16/07	Blanket	Manufacture of a ITER standard HF full prototype
WP10/16/08	Blanket	Completion of Be/CuCrZr joint repair technique
WP10/17/02	Divertor	Manufacturing of Inner Vertical Target Full Size Prototypes
WP10/45/03	CODAC	Support on I&C design and implementation in the frame of EU PAs
WP10/55/09	Diagnostics	R&D/Design of IVS Joints, Feedthroughs and Connectors
WP10/55/12	Diagnostics	Irradiation and post-irradiation testing of diagnostic components and assemblies
WP10/55/14	Diagnostics	Supplies and Support for Design of Diagnostics and Port Plugs
WP10/ND/01	Nuclear Data	Nuclear Data improvements and development of tools
WP10/PE/01	Plasma Engineering	Edge modelling coordination and simulations (incl. dust)
WP10/PE/05	Plasma Engineering	Development of run-away (RE) code for ITER and simulation of RE damage in ITER
WP10/PE/07	Plasma Engineering	Engineering models for plasma feedback control
WP10/PE/08	Plasma Engineering	Conceptual design of plasma control and protection system
WP10/PE/09	Plasma Engineering	Study of a pulse sequence simulator for tokamak
WP10/PE/12	Plasma Engineering	Plasma control development & integration
WP10/SF/01	Safety	Radiological and Environmental Monitoring System Support
WP10/SF/09	Safety	The ALARA application to Occupational Radiation Exposure based on ITER design evolution



Article 3

The following activities are moved from Work Programme 2010 into Work Programme 2011, the related budget adjustments are included in the Appendix II summary table:

WP ref	Area	Activity Title
WP09/11/03	Magnets	Cold Test Facility preparation for PF Coils
WP09/51/03	ICH Antenna	RF Vacuum Windows R&D
WP09/56/11	Test Blanket Modules	Tritium Extraction System (TES) for HCLL-TBM: Test campaign in TRIEX
WP09/ES/02	Engineering Analyses	Electromagnetic analyses
WP09/MD/02	Materials Development	Design rules for EUROFER (Creep-fatigue)
WP09/MD/10	Materials Development	EUROFER TBM design rules for EUROFER welds
WP09/PO/01	QA and Project management	Service of inspectors for ITER project contracts follow-up
WP10/11/01	Magnets	Testing and characterisation of PF strands
WP10/11/02	Magnets	Analysis tasks in support of Magnet activities
WP10/11/09	Magnets	Procurement of Pre-compression Rings
WP10/11/12	Magnets	Testing of TF Nb3Sn Strands
WP10/17/04	Divertor	Engineering Support for procurement of Divertor components
WP10/17/06	Divertor	Pre-production Qualification
WP10/23/01	Remote Handling	IVVS Design Finalisation Including Supplementary Lab Tests
WP10/23/02	Remote Handling	ATS Design Completion &TCS Integration
WP10/23/05	Remote Handling	Irradiation of RH components (motors, sensors etc.)
WP10/31/01	Vacuum Pumping and Fuelling	Follow-up of procurement of PPC
WP10/31/02	Vacuum Pumping and Fuelling	R&D in support of Conceptual design of leak detection system and Leak Localisation systems
WP10/31/03	Vacuum Pumping and Fuelling	Procurement of PPC
WP10/32/04	Tritium Plant	Detailed design of WDS
WP10/32/06	Tritium Plant	Conceptual design of ISS
WP10/34/01	Cryoplant	R&D on compressor technology
WP10/45/05	CODAC	Case study of the application of the CODAC I&C standards to an existing fusion plant system
WP10/51/01	ICH Antenna	Faraday Screen R&D
WP10/53/07	Neutral Beam System	Infrastructures of the Neutral Beam Test Facility - Vacuum and Gas Injection Plants for PRIMA
WP10/53/08	Neutral Beam System	Infrastructures of the Neutral Beam Test Facility - Instrumentation & Control System
WP10/53/09	Neutral Beam System	Infrastructures of the Neutral Beam Test Facility - Cooling System
WP10/53/13	Neutral Beam System	Infrastructures of the Neutral Beam Test Facility - Accelerator and Ground Related Power Supplies
WP10/53/14	Neutral Beam System	Design, development, support to the procurement up to acceptance, of the infrastructures, sub-systems and components at the NBTF
WP10/56/05	Test Blanket Modules	TBM fabrication qualification
WP10/62/02	Buildings	Mandatory and complementary building insurance
WP10/62/04	Buildings	Construction site update and adaptation
WP10/MD/01	Materials Development	Characterisation and validation of EUROFER and EUROFER welds for TBM use
WP10/MD/02	Materials Development	Development of SiC-SiC composites (characterisation of physical properties)
WP10/MD/03	Materials Development	Development of SiC-SiC composites (basic characterisation and irradiation campaigns)



WP ref	Area	Activity Title
WP10/MD/04	Materials Development	Development: EUROFER and EUROFER ODS [Optimisation of properties and processes] EUROFER ODS [Ion Beam and n-Irradiation campaigns]
WP10/MD/06	Materials Development	EUROFER Data base and design rules
WP10/MD/07	Materials Development	EUROFER TBM design rules - High Temperature rules
WP10/MD/08	Materials Development	EUROFER base materials & welding for TBM use - Irradiation campaigns - Characterisation and validation
WP10/MD/11	Materials Development	Low dose irradiation and post-irradiation examination for EUROFER base and weld materials for TBM application
WP10/MF/02	Materials	Material characterisation at room/elevated temperatures
WP10/MF/04	Materials	Support for the quality control of components
WP10/PE/03	Plasma Engineering	Electromagnetic modeling (including 3D)
WP10/PE/11	Plasma Engineering	ITER scenario and plasma performance analysis
WP10/PE/13	Test Blanket Modules	Engineering support and analysis for PE (TBM)
WP10/PE/14	Test Blanket Modules	TF and TBM ripple analysis for ITER
WP10/SF/04	Safety	In vessel tritium inventory control by laser spectroscopy
WP10/SF/05	Safety	Busbar Arc Model Validation and Supporting Experiments
WP10/SF/06	Safety	Combined H ₂ /Dust explosion computer code development
WP10/SF/10	Waste Treatment	Engineering studies for radwaste processes - RWF

Article 4

Appendix II – The table titled “Summary of the WP2010 budget” shall be amended as follows (note that the previous figures shown in strikethrough text):

Budget line	Activity Title	2010 Budget (M€)		
		Grants	Procurements	Cash
3.1+3.5	Design and R&D in support of ITER, credited by ITER IO through PA	0,850 10,962	300,922 266,551+0,500	0,000
3.1+3.5	Contribution in cash in support of ITER	0,000	0,000	77,812 60,000
3.1+3.5	Contribution in cash for transfer of procurement to Japan	0,000	0,000	9,090 17,700
3.1+3.5	Design and R&D in support of ITER, credited by ITER IO through ITA	8,370 19,565	4,290 18,027	0,000
3,6	Expenditure budgeted against other revenue	0,000	0,000	0,000
	Subtotals	9,220 30,527	305,212 285,278	86,902 77,700
3.1+3.5+3.6	TOTAL ITER CONSTRUCTION		401,334 393,505	
3.2	Design and R&D in support of ITER, not credited by ITER IO (incl. materials, TBM, nuclear data)	1,330 7,300	2,420 4,492	0,000
3.2	Total Technology for ITER		3,750 11,792	
3.3	Expenditure in support of Broader Approach	0,000 0,060	5,910 6,323	0,000
3.3	Contribution in cash in support of IFMIF-EVEDA Project team	0,000	0,000	0,256 0,260
	Subtotals	0,000 0,060	5,910 6,323	0,256 0,260
3.3	Total Technology for Broader Approach and DEMO		6,166 6,643	
3.4	Appointment of expert for technical assistance to F4E	0,000	0,000	1,300
3.4	Total Other expenditure			1,300
	Total expenditure by type	10,550 37,887	312,944 296,093	89,056 79,260
3	Total operational expenditure		412,550 413,240	

Article 5

This Decision shall have immediate effect.

Done at Barcelona, 2nd December 2010

For the Governing Board

Carlos Varandas

Carlos Varandas
Chair of the Governing Board