



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 FIRST AMENDED 2024 ANNUAL 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 Council Decision (Euratom) No 198/2007 of 27 March 2007 establishing the European Joint Undertaking for ITER and the Development of Fusion Energy (hereinafter "Fusion for Energy") and conferring advantages upon it¹ (hereinafter "the Statutes") and in particular Article 6(3)(e) thereof, last amended on 10 February 2015 by Council Decision Euratom 2015/224²;

HAVING REGARD to Council Decision (Euratom) No 198/2007 establishing the European Joint Undertaking for ITER and the Development of Fusion Energy and conferring advantages upon it, last amended on 22 February 2021 by Council Decision (Euratom) No 2021/281³;

HAVING REGARD to the Financial Regulation of Fusion for Energy⁴ adopted by the Governing Board on 10 December 2019 (hereinafter "the Financial Regulation"), and in particular Title III thereof;

HAVING REGARD to Commission Delegated Regulation (EU) 2019/715 of 18 December 2018 on the framework financial regulation for the bodies set up under the TFEU and Euratom Treaty and referred to in Article 70 of Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council,⁵ and in particular Title III thereof;

HAVING REGARD to the comments and recommendations of the Joint Undertaking's Administration and Management Committee and of the Technical Advisory Panel on the first Amended 2024 Annual Work Programme;

WHEREAS:

- (1) The Director shall, in accordance with Article 11 of the Statutes, prepare each year the submission of the project plan to the Governing Board, the resource estimates plan and the detailed annual work programme, now merged in the Single Programming Document.
- (2) The Administration and Management Committee shall, in accordance with Article 8a (2) of the Statutes, comment on and make recommendations to the Governing Board on the proposal for the project plan, the work programme, the resource estimates plan, the staff establishment plan, the staff policy plan and other related matters, now part of the Single Programming Document drawn up by the Director;
- (3) The Technical Advisory Panel, in accordance with Article 6 (1) of the Statutes, shall advise the Governing Board on the adoption and implementation of the project plan and work programme, now part of the Single Programming Document;

¹ O.J. L 90, 30.03.2007, p. 58.

² O.J. L 37, 13.02.2015, p.8.

³ OJ L 62, 23.2.2021, p. 41

⁴ F4E (19) GB45 21.1 adopted on 10.12.2019

⁵ OJ L 122, 10.5.2019, p. 1–38.

- (4) The Governing Board, in accordance with Article 6 (3) (d) of the Statutes, shall adopt the project plan, work programme, resource estimates plan, the staff establishment plan and the staff policy plan, now part of the Single Programming Document;

HAS ADOPTED THIS DECISION:

Article 1

The 1st Amended 2024 Annual Work Programme of Fusion for Energy annexed to this Decision is hereby adopted.

Article 2

The Governing Board hereby delegates to the Director of Fusion for Energy the power to make non-substantial amendments to the 2024 annual Work Programme approved by the Governing Board.

Amendments to the 2024 annual Work Programme are considered to be non-substantial if they do not cause the financial resources allocated to the Action concerned in Table 2 of the annual Work Programme to increase by more than EUR 1 million or 10%, whichever is higher.

In any event, the increase of the financial resource of an action shall not exceed 3% of the total budget of the annual Work Programme for the given year.

In addition, any related changes to the scope of the annual 2024 Work Programme shall not have significant impact on the nature of the Actions or on the achievement of objectives of the multiannual Project Plan.

Non-substantial amendments shall not lead to any increase in the total operational expenditure for Title 3 and Title 4 of the annual Budget approved by the Governing Board.

Article 3

This Decision shall have immediate effect. Done in Barcelona, 12 July 2024.

For the Governing Board

Dr. Carlos Alejaldre

Chair of the Governing Board

[Signed electronically in IDM]

For the Secretariat

Romina Bemelmans

Secretary of the Governing Board

[Signed electronically in IDM]

Annex: First Amended 2024 Annual Work Programme

INTRODUCTORY MEMORANDUM

Changes to the Work Programme 2024

The Work Programme 2024 reference, as adopted at GB60, was based on the F4E set of schedules at the end of March 2023.

Since that time, the F4E schedule baseline has been regularly modified following the outcome of the Baseline Change Control Board at F4E. The annual objectives and call for tenders/proposals have been amended consequently.

With the continuous evolution of the project, F4E activities are also subject to modifications. Such changes are captured in the monthly update of the schedule.

Because of this continuous evolution, the work programme, that provides a snapshot of the schedule of the activities at a given time of the year, is prone to significant modifications between submissions to the F4E Governance.

While the work breakdown per year is a meaningful time interval from the budgetary point of view and for the Work Programme that represents its financial decision, it is not for the long-term project that F4E has to implement. Therefore, it is normal that activities spanning over many years, the majority in the case of the F4E projects, may require adjustments in the specific year. Such modifications may be due to many reasons, as delays in the provision of input data for launching the contract, negative results from previous activities, need of modification of procurement strategy following a market analysis, delays in the delivery of hardware from other Domestic Agencies, addition of activities as a consequence of approved PCRs and risk mitigation actions, etc. In such a large high-technology project requiring in most of the cases the use of new technologies and manufacturing paths, it is therefore highly possible that the forecast of activities will vary during the year.

The main responsibility for the project managers at F4E is to avoid that these modifications affect the schedule of the delivery of the components to be assembled into the tokamak and, consequently, the creation of the first plasma.

The available budget was allocated to the various Actions identified in this document. The budget breakdown between Actions is shown in table 2 to this 1st Amendment to WP2024.

The Actions in the Work Programme represent the tasks planned in 2024 to contribute to the overall EU obligations to ITER.

The summary of the most substantial changes is provided in the table below and doesn't include minor modifications. It is noted that the original Work Programme as amended by 1st Amendment reflect the full planned scope of activities for the year.

The F4E schedule used for the preparation of WP2024 Amendment 1 is the version from end April 2024.

The below table recaps the main changes per action brought by WP2024 Amendment 1. The budgetary changes are listed when the variation in value is more than 2M€ or more than 10% of the original budgetary allocation.

Action	Changes
Action 1 - Magnets	<p><u>Budgetary changes:</u> - 1 128 738€</p> <p>(-) sum of minor changes</p> <p><u>Annual objective changes:</u></p> <p>Annual objective "EU11.3B.01160" Delivery of PF3 Coil by EU-DA to IO, brought forward from Q3 to Q2 2024 since the final schedule risk buffers have not been used.</p> <p>Annual objective EU11.1A.11820 "Delivery of TF18 (EU 10)" and EU11.1A.28115 "CFAD approval" carried over from 2023 due to the strategic decision to repair the High Voltage wire on site, transportation arrangements delays towards the end of the year and final repair on site requiring some intermediate steps/iterations to ensure the quality of the repair. Unavailability of expert repair personnel for a few days due to personal circumstances further delayed these objectives.</p>
Main Vessel² (Vacuum Vessel, Blanket, Divertor and TBM)	<p>Main Vessel: + 11 445 810 €</p> <p>Action 2_Vacuum Vessel</p> <p><u>Budgetary changes:</u> + 12 790 162€</p> <p>(-) Following the decision to unfreeze the indexation coefficient and apply the initial contractual provisions, the total "firm" amount of the incentive scheme has reduced.</p> <p>(+) It was decided to bundle the transportation commitments for the last 4 sectors into one single commitment in 2024 in order to reduce administrative burden.</p> <p><u>Annual objective changes:</u></p> <p>Annual objective EU15.1A.08500 "Delivery of Sector 5 by EU-DA to ITER Site" moved from Q2 to Q4 2024. → The need to repair the S5 Field Joint as per IO requirement, following Lessons Learned of the Korean sectors, has</p>

² The budgetary changes of Vacuum Vessel, In-Vessel Blanket, In-Vessel Divertor and Test Blanket Module actions are presented merged in one single line due to commercial sensitive information.

been included in the scope of the supplier and the schedule has been changed accordingly. 5 months have been added to the schedule.

Annual objective EU15.1A.3097540 "Sector 9 Outer Shell welding completed" moved to Q1 2025 and is replaced by the following milestone "Sector 9 - Start of Outer Shell fit-up" (EU15.1A.3119198) with forecast achievement date in Q3 2024. → The manufacturing sequence has changed with respect to the previous planning, advancing welding of the port stub extensions and postponing welding of the outer shell. This change has no effect on the sector final delivery date.

Annual objective EU15.1A.3081300 "Sector 5 START OF Factory Acceptance Tests" achieved in Q4 2023. → Thanks to good supplier performance, especially in welding quality, the FAT could start ahead of schedule.

Annual objective EU15.1A.80540 "Sector 9 Inner Shell welding completed in Q1 2024. → This activity has been completed in advance thanks to good supplier performance and application of lessons learned from Sector 5.

Action 3_In-Vessel (Blanket)

Budgetary changes: + 2 852 600€

(+) In the frame of the acceleration plan of the Blanket Cooling Manifolds Project, the task order 3 for Chimney Pipes has been anticipated, with signature now planned in 2024.

Annual objective changes:

Annual objective EU15.2A.12115 "Manufacturing Inspection Plan approved for Task 1.A (#01)" moved from Q2 2024 to Q3 2024. → Allocation of resources to the Blanket Cooling Manifolds Project was effective in May-2023, leading to a delay against the initial plan of the blanket cooling manifolds series manufacturing under F4E-OMF-1080.

Annual objective EU16.01.12404210 "MS2.A.2 Final Acceptance of the Production Line (Remaining Equipment) - AAC" deleted. → Activity impacted by the change of the first wall armour material.

Annual objective EU16.01.221540 "MS2.A.2 Final Acceptance of the Production Line (Remaining Equipment) -FBL" deleted. → Activity impacted by the change of the first wall armour material.

Annual objective EU.16.01.101790 "Request for Final Tenders for Release of Task 3 – Re-opening of competition #1" added. → New annual objective relevant for the IV Program Team, F4E-OMF-900 blanket first wall series production.

Annual objective EU.16.01.12406760 "MS#03 Manufacturing Readiness Review approved for Task 1 and Task 2 of Standard parts" added. → New annual objective relevant for the IV Program Team, F4E-OPE-1138 contract for standard parts.

Action 4_In-Vessel (Divertor)

Budgetary changes: - 6 105 588€

(-) Budget allocated to the Task Order 2 of the IVT Pre Serie Production is reduced after successful qualification of the 2nd ranked contractor of the Framework Contract.

Annual objective changes:

Annual objective EU17.01.1022200 "HP – Send of the Visual examination and Hydraulic Pressure Tests (M_CB=-2 (CB#17) S23)" deleted → Milestone impacted by non-conformity report related to the internal corrosion of the 4 Cassette Bodies (CB).

Annual objective EU17.01.1175580 "HP – Reception of the Load Test Report the SF1 (CB#16)" added. → New milestone for Cassette Body Stage 1 Lot 1.

Annual objective EU17.03.1040 "IPL PA 1.7.P2E.EU.01 for Divertor Rails Signed" deleted → Project is on hold. Joint decision F4E-IO expected on June 2024 on the way forward as highly impacted by changes from Remote Handling system.

Action 10_Test Blanket Module

Budgetary changes: + 1 908 636€

(+) The signature of a commitment for Eurofer Procurement (TBM Box Qualification) originally planned for November is now confirmed. Budget is therefore allocated in the first amendment of the Work Programme.

(+) The budget needed for a task order for Proof of the TBM-sets fabrication and assembly processes feasibility has increased as the scope was enlarged.

(-) A task order for WCLL TBM Set PD & FD is strategically postponed to 2025 to have the support for the PDR with IO.

Annual objective changes:

Annual objective EU56.01.1242855 "Task Order Signed for TO1 for FwC for EUROFER design limits codification in RCC-MRx" moved from Q2 to Q4 2024 → Due to technically difficult scope, the call for tender process was deferred.

Scope of Annual objective EU56.01.1327040 "F4E-OFC-0950-01 Task Order 05 Signed for HCCP TBM set for PDR" changed → TO-6 has been merged into TO-5 thanks to an optimised strategy for task order placement.

Annual objective EU56.01.1379930 "Task Order Signed for TO 07 for First elements of design + design by analysis in view of the FD gate" deleted → The work under this task order will now be executed under task order number 5 due to expiry of the framework contract.

Annual objective EU56.01.81615 "Task Order Signed for TO2 for WCLL TBM Set PD & FD" deleted → Milestone deferred to 2025 due to long duration of the on-going task order 1.

Annual objective EU56.02.1240200 TO4 "Signed for Handling, Cutting Storage Serv for Steel Products related to the EU TBMs" changed from Q2 to Q1 → Milestone achieved ahead of the forecast date

	<p>Annual objective EU56.03.10470 “Task Order Signed for TO 04 for WCLL Ancillary Systems PD” change in activity ID → Activity ID changed due to cleaning in Primavera P6.</p>
Action 5 - Remote Handling	<p><u>Budgetary changes:</u> -1 414 033€</p> <p>(-) Due to resources constraint and re-prioritization of activities in the Remote Handling programme, a task order for the CTM and CMM first assembly control system has been postponed to 2025. (+) Settlement agreement for the Port Cell integration of CPRHS with CSI has been implemented this year. <u>Annual objective changes:</u></p> <p>Annual objective EU23.03.14046172 changed to EU23.03.14069040 “CPRHS TO-577-02-02 Subtask 9 CDS Lift completed” → De-scoping of machine assembly related Cask Docking System (CDS), due to commercial difficulty with the supplier. In addition, ITER re-baselining requests extended CDS scope including more than 30 variants. Scope moved to dedicated contract to be launched together with IO.</p> <p>Annual objective EU23.03.14047212 changed to EU23.03.14074440 “CPRHS OMF-1034-01-06 DDL-047 D2.5.02 Assembly Drawing CTS approved” → Contract logic and timing has been negotiated with the supplier during signature process in Q4 2023 (after WP document prepared).</p> <p>Annual objective EU23.05.14054760 changed to EU23.05.14054460 “M6 - CDH Concept Design Review [OPE-1252]” → Due to unavailability of ceiling under OMF-1034, the procurement strategy has changed. The Preliminary Design & Final Design for Top Lid Opening Mechanism and Beam Line Transporter captive scope is moved to OMF-1609.</p>
Action 6 - Cryoplat & Fuel Cycle	<p><u>Budgetary changes:</u> + 1 186 450€</p> <p>(+) New commitment for the procurement of components needed for Leak Detection. (+) Anticipation of the signature of a commitment for the Manufacturing and Delivery of neutral beam instrumentation and control for the cold valve boxes (-) The commitment for indexation for the Leak Detection contract is cancelled because of the termination of the contract.</p> <p><u>Annual objective changes:</u></p> <p>Annual objective EU31.03.25790 “Pre-FDR completed for CDLDS and NBDLDS” added → After several months of discussions and negotiations, the main contract for Leak Detection has been terminated. This will require a full re-organization of procurement and activities, pushing the FDR into 2025. In exchange, the overall cost of the project has been reduced and the forecasted Estimate at Completion is now within the Project Budget.</p>
Action 7 - Plasma Engineering & Operations	<p><u>Budgetary changes:</u> NA</p> <p><u>Annual objective changes:</u> NA</p>

<p>Action 8 – Heating & Current Drive</p>	<p><u>Budgetary changes:</u> + 775 321€</p> <p>(+) sum of minor changes</p> <p><u>Annual objective changes:</u></p> <p>Annual objective EU52.03.17200 “Task Order Signed for Technical Follow-up of Gyrotron Tubes & Super Conducting Magnets” moved from Q3 to Q4 2024 → The milestone is now forecasted in Q4 2024 due to the preparation of both the technical specifications for the framework and the specific contract taking longer than expected.</p> <p>Annual objective EU52.03.228120 “SCP-52HV07 - SAT Completed (M3.2.5)” deleted → The milestone is now forecasted in Q4 2025 due to the prerequisites/site conditions for the start of commissioning activities are not yet met. These include the availability of the 22KV interface (under the leadership of IO) and the building conditions (under the leadership of F4E). Consequently, the site acceptance test for the second set has been delayed.</p> <p>Annual objective EU53.06.08190 “Start of Installation of AGPS-CS of IHNB-1 (GB27)” deleted → The milestone is now forecasted in Q1 2026 due to Building 34 and Interfaces availability delay (Building 34 Ready for Equipment Date is now forecasted in 2025).</p> <p>Annual objective EU53.TF.15690 “Delivery of MITICA Beam Source by EUDA to PRIMA Site” deleted → The milestone is now forecasted in Q2 2025 due to a failure in the ion source during assembly tests. Repairing and assembly continuation foreseen during 2024. The accelerator part is completed.</p>
<p>Action 9 - Diagnostics</p>	<p><u>Budgetary changes:</u> - 689 808€</p> <p>(-) A task order for Radial Neutron Camera Port Plug Components Manufacture is moved to 2025 reflecting the current status of the tendering process.</p> <p>(-) A task Order for Development of Bolometer data-analysis Software is late in the year; budget allocation will be revised in September if it is confirmed.</p> <p>(+) An amendment for Tenants integrations on EUDA Ports to cover the need of having a port integrator.</p> <p><u>Annual objective changes:</u></p> <p>Annual objective EU55.02.106970 “FDR approved by Steering Committee for Port-plug-mounted Bolom. Camera (EPP01, UPP01, UPP17)” is deleted → Unexpected technical issues arose with the design of both the upper and equatorial port cameras during final engineering analysis prior to the Final Design Review meeting. Work continues to identify modifications leading to a viable design.</p> <p>Annual objective EU55.06.107080 “Approval of Manufacturing Readiness Review for Feedthroughs components” is deleted → Start of technical work under the awarded contract was delayed by the need to resolve compliance issues raised by the supplier after contract signature. During 2024, F4E has worked with the supplier to address several underperformance issues and the milestone is now forecasted for 2025.</p> <p>Milestone EU55.06.681820, a predecessor to EU55.06.107080, has been added as a replacement.</p>

	<p>Annual objective EU55.06.697140 "IPL>Delivery of In-vessel clips, clamps and junction boxes for VV Sector 2 (Batch 9) by EU-DA to IO ITER site" is deleted → Milestone impacted by the introduction of risk buffers accounting for actual supplier performance in earlier batches. The milestone is forecasted for 2025 but it is targeted for 2024.</p> <p>Annual objective EU55.13.908990 "MRR Meeting for MfG PP EP12 (3HDLs+1FMU)" is deleted → Closure of the Final Design Review is a predecessor for this milestone and is currently delayed due to resolution of a non-endorsement by IO of a proposed weld detail. Agreement has been reached between F4E and IO on a new weld detail and associated tests to validate this are underway with results expected by Q2 2024.</p>
<p>Action 11 - Buildings and Civil Infrastructures</p>	<p><u>Budgetary changes:</u> + 27 842 645€</p> <p>(-) TB21: Due to ongoing radical optimization exercise requested by GB61 (April 2024), the number of Fire Isolation Devices is expected to be significantly reduced. Hence the associated Task Order is put in standby, waiting for revised design resulting from optimizations.</p> <p>(+) AE II: the signature of a commitment for Architect Engineering Services II, covering the core activities until 2030 and originally planned for November is now confirmed. Budget is therefore allocated in the first amendment of the Work Programme.</p> <p>(+) TB12: Compensation of impact of raw material was finally agreed and implemented in amendment 2. Increase of Contingency due to materialization of risks in EAC.</p> <p>(+) TB13: Compensation of impact of raw material was finally agreed and implemented in amendment 2.</p> <p>(+) TB22: the signature of the task order #3 for Secondary structural works, originally planned for November is now confirmed. Budget is therefore allocated in the first amendment of the Work Programme.</p> <p><u>Annual objective changes:</u></p> <p>Annual objective EU62.05.235 "IPL > NB Power Supply Building (34) RFE (RFE #9)" moved to 2025 → Schedule risk buffer inclusion in the sequence of activities as part of the exercise to add realism in the schedule. The risk buffer have moved the activities hence the final taking over. Annual objective replaced by EU62.05.460 IPL > Construction of Cryoplant Coldbox Building (52) Completed (GB21)</p> <p>Annual objective EU62.05.275 "IPL > NB High Voltage Power Supply Building (37) RFE (RFE #9)" moved to 2025 → Schedule risk buffer inclusion in the sequence of activities as part of the exercise to add realism in the schedule. The risk buffer have moved the activities hence the final taking over. Annual objective replaced by EU62.604260 Construction of 2 Bus-Bar Bridges (between B32 &74 and B33 &74) Completed (GB58 IC90.1)</p> <p>Annual objective EU62.05.580 "IPL > Construction of Control Building (71 non PIC part) Completed" moved to 2025 → Schedule risk buffer inclusion in the sequence of activities as part of the exercise to add realism in the schedule. The risk buffer have moved the activities hence the final taking over. Annual objective replaced by EU62.886781 Civil works completed for MV Distribution Bldg LC/2B (47) - Level 4 (Predecessor GB26)</p> <p>Annual objective EU62.05.620 "IPL > Construction of Fast Discharge & Switching Network Resistor Building (75) Completed" delayed from Q1 to Q4 2024 → Milestone delayed due to services installation progressing lower than</p>

	<p>expected. No impact to IO as RFE (allowing IO installation) was granted on Sep-22.</p>
<p>Action 12 - Cash Contributions</p>	<p><u>Budgetary Changes:</u> + 3 182 200€</p> <p>(+) The forecast of the Cash Contribution to IO has increased based on indicative estimates for the IO Draft Income Budget 2025 proposed by IO to the 37th MAC meeting of May 2024</p> <p><u>Annual objective changes:</u></p>
<p>Action 13 - Technical Supporting Activities</p>	<p><u>Budgetary Changes:</u> + 6 845 307€</p> <p>(+) Transfer of budget from programme teams to engineering unit to fund the new IRIS Cost Centre (Technical and data management), with a first task order in 2024.</p> <p>(+) sum of minor changes</p> <p><u>Annual objective changes:</u></p> <p>Annual objective EU.ES.03.63480 “Published Call for Tender for I&C integration services” moved from Q2 to Q4” → After continuously assessing the needs of the other projects, it was decided that the call will be postponed to Q4, to fully utilize the on-going TO’s and FWC ceiling.</p> <p>Annual objective EU.PE.6103150 “Amendment Signed for Plasma Engineering Studies Part I – Modelling for load specifications” and annual objective EU.PE.6103530 “Contract Signed for Plasma Engineering Studies Part II” added → Annual objectives moved from action 7 to action 13.</p>
<p>Action 14 - Broader Approach</p>	<p><u>Budgetary changes:</u> -18 964 520€</p> <p>(-) The commitment for the JT-60SA Actively cooled Divertor (integration of cassette bodys, HHF and NHF elements) is postponed to 2025. There has been a request from the JT-60SA stakeholders to change the philosophy with regards to the divertor manufacture and installation from a carbon construction to a tungsten construction. This has implications for all of the divertor related contracts, and the extent is currently under review.</p> <p>(-) The signature of the commitment for the development of solid state amplifiers Stage 3 and option 1 is postponed to 2025. There is a slight delay in the release of the stage due to the unavailability of qualified personnel for welding and assembly activities on long-term sick leave, as well as availability of storage area for the series SSPA not yet firmly confirmed on Rokkasho site, which is a prerequisite for the series delivery.</p> <p>(-) The cash contribution foreseen for the extraction and the repair of the Central Solenoid is reduced due to delay in the decision making regarding the repair. Presuming that the decision is made to repair the Central Solenoid the remaining cash contribution is expected in early 2025.</p> <p>(+) The signature of a commitment for the JT-60SA Waveguide components is cancelled due to legal constraints and the contract is transferred to QST which can proceed with the procurement. A cash contribution will be made to QST to cover the costs which are higher than foreseen.</p> <p><u>Annual objective changes:</u></p>

	<p>Annual objective EU.BA.01.23360 (Placement of the contract for the Injector upgrade) removed → A key input to launch the call for tender is the operational feedback gathered during phase B+. This phase has been extended until June 2024, hence the milestone is delayed.</p> <p>Annual objective EU.BA.01.25080 “Contract placement for the integration of cassette bodies, HHF and NHF elements of the JT-60SA actively cooled Divertor” removed → There has been a request from the project stakeholders to change the philosophy with regards to the divertor manufacture and installation from a carbon construction to a tungsten construction. This has implications for all of the divertor related contracts, and the extent is currently under review. The change will lead to a delay for all divertor related contracts, and the overall schedule effect should be defined by the end of 2024. As a result, the objective cannot be reached in 2024.</p> <p>Annual objective EU.BA.01.38880 “Delivery of the centrifuge accelerator for JT60SA pellet launching system” removed → A contract has been placed for one of the key supplies for the centrifuge with a Russian company. Associated with this contract, there are technical issues where the contractor is having difficulties to meet the specification, leading to a long delay in the delivery of the hardware. This objective cannot be met in 2024.</p> <p>Annual objective EU.BA.01.38960 “Prototype engineering and manufacturing dossier of the RF System Enhancement pre-series removed → Objective postponed to the first quarter of 2025 due to the unavailability of qualified personnel for welding and assembly activities on long-term sick leave, as well as availability of storage area for the series SSPA not yet firmly confirmed on Rokkasho site, which is a prerequisite for the series delivery.</p>
<p>Action 15- DONES</p>	<p><u>Budgetary changes:</u> + 2 235 800€</p> <p>(+) Cash contribution to IFMIF-DONES-Espana for the early deployment and training of human resource for the DONES construction phase</p> <p>(+) New commitment forecast for the procurement of EUROFER</p> <p><u>Annual objective changes:</u></p> <p>Annual objective EU.DO.00110 “Placement of the contract for the Prototype components SRF Linac Coupler” is removed → Due to the lack of resources the procurement strategy had to be changed resulting in a delay in the placement of the contract.</p> <p>Annual objective EU.DO.00120 “Placement of the engineering support contract for DONES Project Management” changed to Objective EU.DO.00270 → As the contract was already placed in 2023, in year 2024 the launch of the option is foreseen to cover another year of support and is added as objective.</p> <p>Annual objective EU.DO.00160 “Placement of the contract for the Prototype components RFQ Coupler” changed to objective EU.DO.01410 → Due to the change of procurement strategy, the contract for the RFQ coupler is to be placed in stages, the first stage (Work Plan) is to be finished in 2024 – indicated as the changed objective - and stage 2 (Verification and Validation of the Technical proposal) is to be released by the end of 2024.</p>

1. DEFINITIONS, ASSUMPTIONS AND SUPPORTING INFORMATION TO WP2024

The 2024 Work Programme takes into account to the extent possible the European Commission's guidelines for the Programming document as requested by the Financial Regulation. It comprises a general overview of the progress of work and the procurement activities that will be committed during 2024, detailed objectives, expected results, and targets for each WP Action.

Main assumptions

The following assumptions are considered as the basis of the Work Programme 2024:

- The F4E schedule used for the preparation of this document is the one submitted to IO at the end of April 2024.
- The F4E schedule takes into account:
 - ✓ The latest input and developments of the schedules from the F4E suppliers, taking into account the agreed fabrication routes and showing the real development of the work.
 - ✓ The most realistic assumption of Procurement Arrangement (PA) signature dates based on the current status of the design of components and on the forecasted dates of the required design reviews prior to the PA signature.
 - ✓ The available manpower in F4E, taking into account bottlenecks in specific areas where staffing is not sufficient to grant a prompt process of the work. In specific cases, F4E foresees to satisfy its manpower needs by using external contractors.
 - ✓ The most realistic assumptions on the input data availability from IO to take into account the existing delays and the agreed dates of data delivery.
 - ✓ The information provided by the other DAs through their monthly Detailed Work Schedule to take into account any possible delay in the delivery of items to F4E that can cause delays to the EU in-kind procurements.
- The budget figures are based on the MFF 2021-2027 approved by the Council on 22/02/2021 plus ITER Host State and Membership contributions. The budget summary table of Work Programme 2024 (WP_table 1) reflects the current status of the draft budget for the 2024 financing decision.
- In order to achieve an improvement of the quality of the PAs that need still to be signed, a common F4E/IO effort is still in progress to better identify the requirements that are linked to the specific procurement.
- Technically and commercially complex procurements will be implemented whenever appropriate through the competitive dialogue procedure or through the negotiated procedure, in order to improve the alignment of supply chain response to F4E needs and to proactively adopt cost containment measures. This will be done in compliance with F4E's Financial Regulation.
- Grants related to recurring and sequential R&D activities, with a well-defined development path eventually leading to an EU procurement package, will be implemented whenever appropriate, through Framework Partnership Agreements (FPA), in order to streamline and channel R&D funding, improve its effectiveness, and decrease the administrative burden to beneficiaries and F4E alike.
- Procurements which require a very close coordination between F4E and other entities will be implemented, whenever appropriate, through the Joint Procurement procedure.
- All the activities described in the overview of each Action and the list of contracts in WP_Table 3 are intended as credited by PA or ITA. If an Action is not credited, then it is explicitly mentioned in the overview. This is not applicable for the Action "Broader Approach" (i.e. not credited).

- F4E endorsement of the Japanese Procurement Arrangement that foresees an EU financial contribution will be preceded by a budgetary commitment for the entire amount of the F4E contribution.
- Changes originated by IO, or other DA's, will be fully compensated by the IO Reserve Fund.
- The Art. 5 of the F4E Statutes states that the Joint Undertaking may award grants and prizes in accordance with the rules of its financial regulation. In this regard, Essential selection, award criteria and Upper funding limits are defined in these annexes.
- Article 74 (2) of F4E's financial regulation in conjunction with Article 1(5) of Annex III to the F4E Statutes provides for the possibility to make use of annual instalments for actions extending over more than one financial year. An annual instalment consists in breaking down a budgetary commitment into annual instalments. Annual instalments can be implemented according to the forecast of annual payment due, the forecast of progress in the implementation of the contract, or annual budget availability.

Definitions and supporting information

1. "Action" for the purposes of Work Programme means "a coherent area of action with objectives and resources". The list of the Actions and their definition is defined in the main text of the SPD.

2. Each Action of WP2024 comprises:

(a) **General overview** that is split into two parts. The "Progress of Work" part aims at providing the information concerning the activities foreseen during 2024 in that area. The "Procurement Activities" part instead focuses on the legal commitments foreseen during the year and to be covered by the financial decision and to be financed under the budget 2024. Furthermore, it includes (even if not explicitly mentioned):

i. Provisions for urgent general support tasks as cost/risk analysis, engineering support/analysis, I&C develop and support, experts, quality assurance and quality control, nuclear safety, CE marking analysis, transportation, storage, material characterization and qualification activities, resolution of non-conformities (in line with the mechanism agreed at ITER level), metrology, low value purchase orders and external legal support, cost of legal proceedings and alternative dispute settlement, including arbitration, as needed³. These tasks will be mainly implemented through specific contracts under existing framework contracts.

ii. Provisions for payment of liquidated damages, late payment interests, cost escalation, claims, release of options, indexation and other financial compensations that F4E may be obliged to pay under its contracts.

iii. Provisions for amendments to ongoing contracts covered by a previous financing decision(s) in accordance with the Implementing Rules.

iv. Provisions for BREXIT-related contractual modifications.

v. Provisions for Covid 19 related contract modifications and Covid 19 related new contracts for ITER and Broader Approach

vi. Provisions for new contracts and contractual modifications related to expiry of Switzerland co-operation agreement

vii. Provisions for specific cash compensations to IO required in case of transfer of activities from F4E to IO approved by the ITER Management Advisory Committee.

viii. Provisions for contract modifications and new contracts linked to the new ITER baseline.

³ In accordance to F4E WBS implementation rules, whenever a procurement activity is in support of a specific WBS L3, the related procurement should be implemented under the mentioned WBS L3. This is not the case for general technical support activities to multiple WBSs (e.g. external resource to support overall risk management, etc.). In this case, they are included under Action 13

- (b) **Annual objectives** defined as the achievement on time of the following milestones:
- i. ITER Council/Governing Board (IC/GB) milestones in 2024;
 - ii. Milestones that will lead to the achievement of the future IC/GB milestones from the following years (defined as predecessor of future IC/GB milestones (if applicable)).
 - iii. Key milestones marking significant schedule progress (only in the event that none of the above are applicable).
 - iv. Link with the ITER Project multi-annual objectives (defined as the whole set of IC/GB milestones): when a WP annual objective is a predecessor of a multi-annual objective (IC/GB milestones), it is clearly identified to which milestone is linked in the column “type of milestone”.
- (c) The **expected results** define the main outcomes of the Actions.
- (d) The **target** is defined as the annual M-SPI reaching a minimum value.⁴
- (e) **Human resources** (see HR_Table 1 of annexes to HR REP annexes). The table shows an indicative estimate of the Full Time Equivalent (FTE) staff assigned to the specific Action to cover all the activities carried out in 2024. Per each Action it is identified the “core” team and the additional staff (i.e. legal, financial, contractual, project management) assigned to the action according to the F4E matrix structure. Remaining staff from the Commercial Dept., Admin. Dept. and Office of the Director is instead allocated per action on a pro-rata basis.
- (f) **Procurement plan:**
- i. Main Procurement Initiatives (see WP_Table 3 of these annexes): these are, per Action, the list of the foreseen main contracts with value higher than 139,000 Euros⁵. Amendments, claims, reimbursement, indexation, late interest and budget reserve are grouped together due to the sensitivity of this information. The list is based on the current information at the time of writing the Work Programme. During the implementation of the Work Programme activities, F4E may identify the need for new calls, group more activities in a single call or split one activity in more calls. This will in any case be performed preserving the scope and objective presented in WP2024. Contracts that do not fulfill the Work Programme scope identified for each Action are not covered by this financial decision and therefore will not be authorized. A change to this list shall be considered as a non-substantial for the purposes of the Article 32 point 4 of the F4E Financial Regulations if not affecting the available budget for 2024 within the limit of the flexibility rule and if any related changes to the scope of the annual Work Programme do not have significant impact on the nature of the Actions or on the achievement of objectives of the multiannual Project Plan.
 - ii. Value per Action: WP_Table 2 presents an indicative value of financial resources corresponding to each Action. F4E has evaluated the level of commitments planned for the Actions in 2024 by taking into account the progress of the project and the available manpower. A good implementation of the annual commitment is one of the objectives for F4E (see PP_Table 7 in Annexes to Project Plan). Any additional budget required and exceeding the currently available one will consist of unused appropriations adjusted to match the final needs.
 - iii. Indicative timeframe for launching the procurement and type of procedure/contract: the foreseen time of publication of calls and type of contracts is shown in WP_Table 5 of these annexes. The dates are indicative only and based on the present understanding of the project development. For specific contracts and specific grants or use of Joint Procurements the foreseen time of publication of calls is not included as no formal publication will take place (the signature date is used to give anyway an indication of time). Publication of the call for tender is intended as the date of publication on the Industry Portal (for open procedures/call for proposals) and the date of the Invitation letter to be sent out to the Suppliers (for negotiated procedures). For restricted procedures and competitive dialogues this milestone refers to the date of the call for expression of interest (first phase of the procedure).
 - iv. The plan may cover some activities moved from previous years into WP2024 due to changes in the overall planning and priorities.

⁴ For Action 12 Cash Contributions and Action 13 Technical Support Activities Annual M-SPI is not applicable.

⁵ The threshold has been selected so to be in line with the FR.

v. The plan does not (and cannot) include the consequences for the Action of PCRs and deviations approved by the IO Director General or his delegates in the frame of Reserve Fund Management Plan. As a result, these will be implemented under the budget line 3.6. For information, F4E will present to the final meeting of the GB each year, in an amendment to the Work Programme, a summary of the PCRs agreed within the year and the activities that the PCRs (including those agreed in previous years) have funded.

vi. Grants and specific Grants are clearly identified and information is provided to fulfill art.58 of the Financial Regulation (see WP_Table 4 of these annexes).

vii. Framework Partnership Agreements (FPA) or Framework Contracts (FWC) are included in the year of signature for clarification purposes only and do not constitute part of the financing decision.

3. Some of the Work Programme activities refer to provision for recurrent activities with the same ultimate objective of supporting the final achievement either of the design (e.g. CAD support, engineering analyses, etc.), the manufacturing process (e.g. QA/QC Inspectors, engineering support for deviations analyses, CE marking, etc.) as requested in ITAs/PAs, or the site support services (access control and security, Facility Management Services, etc.). Therefore the description in terms of the financing decision does not change significantly from one year to the next.

2. OBJECTIVES AND KEY PERFORMANCE INDICATORS

Work Programme objectives

The Work Programme objectives are the achievement on time of a selected number of milestones. A minimum of 4 objectives is provided per Action as described in below section 3.

There is a close link between the long-term planning (i.e. Project Plan) and the short-term activities (i.e. work programme). In the Work programme, F4E is tracking as Work Programme objectives some selected existing milestones leading to the IC/GB ones (i.e. the predecessors) and in the chain of all critical and near-critical paths. Therefore such milestones in the short-term will act as an alert against the increasing risk of missing any critical and near-critical path milestones in the longer term.

Annual objectives

From the full list of Annual objectives described in the Project Plan, the following ones apply directly to the Work Programme:

AREA	Objective
Annual M-SPI	SPI above defined value
Annual commitment budget	Implement a defined percentage of commitment appropriations by end of the year
Budgeted forecast of the Work Programme	Implement a defined percentage of allocated commitment appropriations the Work Programme Actions without reserves, by the end of the year

Key Performance Indicators

From the full list of Key Performance Indicators described in the Project Plan, the following ones apply directly to the Work Programme:

Annual M-SPI

$$\frac{\text{Number of milestones with Status = Completed}}{\text{Number of milestones with reference date} \leq \text{Current month}}$$

Annual commitment budget

$$\frac{\text{Actual commitment executed to date} + \text{remaining commitment planned to be executed between date and year's end}}{\text{Latest approved annual commitment budget}}$$

Annual budgeted forecast of Work Programme

$$\frac{\text{Actual commitment executed to date} + \text{remaining commitment planned to be executed between date and year's end}}{\text{Latest approved budgeted forecast of the Work Programme Actions}^6}$$

⁶ Excluding Reserves

3. LIST OF WP2024 ACTIONS

Action 1. Magnets

Action 1		Magnets		
Poloidal Field Coils				
<u>Progress of Work</u>				
The final manufacturing and testing activities of the last PF Coil #3 will be completed (some final assembly activities and cold test). The Coil will be delivered to IO.				
The last TF Coil will be delivered to IO.				
<u>Procurement Activities</u>				
Amendments and/or options for existing contracts may be signed (i.e., contract extensions, claims, deviation notices, etc.).				
Task orders related to quality inspection services or production support might be signed to reinforce the PF Coil manufacturing activities.				
Some task orders might be signed to cover for Engineering, Qualification and Testing activities related to the manufacturing of the coils.				
Some minor complementary Contracts and/or task orders might be signed, if needed, to support the production in the PF Building (i.e., Framework Contracts for materials, services, etc.)				
WORK PROGRAMME OBJECTIVES				
Milestone ID	Scope description	Forecast Achievement Date	Type of Milestone	PA/ITA
EU11.3B.01160	IPL > Delivery of PF3 Coil by EU-DA to IO	Q2 2024	WP24 objective	PA 1.1.P3A-B.EU.01 Poloidal Field Magnets 2,3,4,5,6
EU11.1A.11820	IPL > Delivery of TF18 (EU 10) by EU-DA to ITER Site	Q2 2024	WP24 objective	PA 1.1.P1A.EU.01 Procurement of Toroidal Field Magnets
EU11.1A.28115	HPC- Approval by IO for Document CFAD (HP 9.1.6) / TF-EU10 (IC64 /GB54)	Q2 2024	GB54	PA 1.1.P1A.EU.01 Procurement of Toroidal Field Magnets
EXPECTED RESULTS				
The main expected results for this action are:				
Deliver the last PF Coil to IO and close Magnets Program.				
TARGET				
The target for 2024 is "Annual M-SPI \geq 0.8"				

Action 2. Vacuum Vessel

Action 2	Vacuum Vessel			
Main Vessel				
<u>Progress of Work</u>				
<p>The manufacturing of the Vacuum Vessel will continue during 2024. Sector 5 will be delivered to Cadarache, Sector 4 will be completed except for Field Joint repairs. Only one side of the Field Joint of Sector 4 will be repaired due to unavailability of a turning frame in Walter Tosto. Sectors 9, 3 and 2 will have entered in the final assembly phase. <u>Procurement Activities</u></p> <p>Provisions will be made for the transportation of the sectors to the ITER site, resolution of non-conformities if required (including, but not limited to possible out of tolerances), possible continuation of incentive schemes and/or other actions for schedule stabilization, inspectors, additional ANB support and the possibility to add specialized resources to the project. Contractual options for the Main VV contract may be released, as needed.</p> <p>Specific Contracts for support activities, like on-site Inspectors, Documentation Support, Engineering and Analysis, Project Management support, Experts etc... will continue to be issued depending on the project needs.</p>				
WORK PROGRAMME OBJECTIVES				
Milestone ID	Scope Description	Forecast achievement date	Type of milestone	PA
EU15.1A.08500	IPL > Delivery of Sector 5 by EU-DA to ITER Site	Q4 2024	GB16	PA 1.5.P1A.EU.01 Vacuum Vessel - Main Vessel
EU15.1A.3081300	S5 START OF FAT	Q1 2024	Predecessor of GB16	PA 1.5.P1A.EU.01 Vacuum Vessel - Main Vessel
EU15.1A.3119198	S9 - Start of Outer Shell fit-up	Q3 2024	Predecessor of GB25	PA 1.5.P1A.EU.01 Vacuum Vessel - Main Vessel
EU15.1A.80540	S9 Inner Shell welding completed	Q2 2024	Predecessor of GB25	PA 1.5.P1A.EU.01 Vacuum Vessel - Main Vessel
EXPECTED RESULTS				
The main expected results for this action are:				
<ol style="list-style-type: none"> 1. Completion of Sector 4 excluding Field Joint repairs. 2. Final machining of all segments of Sector 2 and 3 completed 3. All segments of Sector 3 on the assembly frame 4. All segments of Sector 2 on assembly frame 				
TARGET				
The target for 2024 is "Annual M-SPI \geq 0.8"				

Action 3. In Vessel – Blanket

Action 3	In Vessel - Blanket
<p data-bbox="256 338 592 369">Blanket First Wall project</p> <p data-bbox="256 390 477 422"><u>Progress of Work</u></p> <p data-bbox="256 443 1401 709">The decision to discontinue the Be activities was taken by ITER Organisation in October 2023 (i.e. with the approval of the corresponding PA Change Notice). Therefore, only the non-Be activities are continuing during 2024 under the current contractual configuration, including the start of the process to re-open the competition of the series manufacturing contract (limited to the First Wall panels structures), which is planned to be signed in 2025. Additional commitments related to the development/qualification of the new armour design (i.e. based on tungsten) maybe executed in 2024 and will be subject to decisions expected during the year 2024 from ITER Organisation.</p> <p data-bbox="256 737 1401 1073">In 2024, both contractors of the Blanket First Wall Series (F4E-OMF-900) will continue the manufacturing activities of the first wall panel structures (i.e. excluding the armour). Task 1, namely Engineering & Production Line Setup, was expected to be completed by both contractors during 2024 but it has been impacted by the change of the First Wall armour material and the planned date is now 2025 for both suppliers. The procurement of main raw materials (only for CuCrZr) will continue to be implemented through task orders. These materials are being provided as free issued items to the Suppliers in charge of FW Panels manufacturing. In support of the main procedure OMF-900, material characterisation activities will be carried out through task orders of the OMF-1082. Since the F4E-OMF-900 is a cost-plus-fee type of contract, financial audits will be performed under the F4E-OFC-1094.</p> <p data-bbox="256 1094 1219 1125">The planned progress of work is subject to the availability of internal resources.</p> <p data-bbox="256 1146 537 1178"><u>Procurement Activities</u></p> <p data-bbox="256 1199 1401 1367">A new task order for material characterization and related options in support to the F4E-OMF-900 will be signed. Specific task orders for thermo-mechanical analysis of first wall panels are planned. In addition, specific task orders for audit services of the cost-plus fee type of contract F4E-OMF-900 are planned. External support needed for the follow-up of the FW panels production will be sourced through specific contracts under existing framework contracts.</p> <p data-bbox="256 1388 1401 1556">Any further decision on the potential change of the First Wall armour material (e.g. on the final design of the armour) may impact the scope of activities under WP2024. Additional commitments related to the development/qualification of the new armour design maybe executed in 2024. Commitments related to residual obligations on beryllium management may be executed as well.</p> <p data-bbox="256 1577 1401 1640">The planned procurement activities are subject to the requested allocation of internal resources.</p> <p data-bbox="256 1661 708 1692">Blanket Cooling Manifolds project</p> <p data-bbox="256 1713 477 1745"><u>Progress of Work</u></p> <p data-bbox="256 1766 1401 1864">In 2024, the main activity will be the continuation of the qualification phase and of the manufacturing of the first pipe bundles of three 10-degree sectors (Task 1 of OMF-1080, two suppliers). Moreover, activities under Task Order 8 will continue aimed at the procurement of</p>	

316L ITER grade raw material for the manufacturing of the blanket cooling manifolds. Additional activities for design and testing of alternative support will continue.

Technical specification for Task 3 will be finalized and the contract, following the re-opening of competition procedure, will be signed.

Acceleration actions, aimed to increase the confidence in the schedule for Tasks 2, 4 and 5, will have relevant impact on the commitment plan from 2025 on. However, during 2024, technical analysis will be performed together with IO to optimise the manifolds customization activities.

The planned progress of work is subject to the availability of internal resources.

Procurement Activities

The main procurement activity planned in 2024 is the signature of Task 3 Chimney Pipes. Additional activities for design and testing of alternative support are planned to be signed.

WORK PROGRAMME OBJECTIVES

Milestone ID	Scope description	Forecast Achievement Date	Type of Milestone	PA/ITA
EU15.2A.10200	Task Order Signed for Task 3 - Chimney Pipes	Q4 2024	WP24 objective	PA 1.6.P6.EU.01 Blanket Manifolds
EU15.2A.12115	Manufacturing Inspection Plan approved for Task 1.A (#01)	Q3 2024	WP24 objective	PA 1.6.P6.EU.01 Blanket Manifolds
EU.16.01.101790	Request for Final Tenders for Release of TASK 3 - Reopening of competition #1 OMF-900	Q4 2024	WP24 objective	PA 1.6.P1A.EU.01 Blanket First Wall
EU.16.01.12406760	MS#03 Manufacturing Readiness Review approved for Task 1 and Task 2 of Standard parts	Q4 2024	WP24 objective	PA 1.6.P1A.EU.01 Blanket First Wall

EXPECTED RESULTS

The main expected results for this action are:

- Blanket First Wall, F4E-OMF-900: Request for Final Tenders for Release of Task 3 – Reopening of Competition #1 OMF-900.
- Blanket First Wall, F4E-OPE-1138: Manufacturing Readiness Review approved for Task 1 and 2 of Standard Parts.
- Blanket Cooling Manifolds, F4E-OMF-1080 Task 1: Approval of the manufacturing inspection plan for Task 1A (first supplier) of the Blanket Cooling Manifold -part of the qualification phase of the first pipe bundles of three 10-degree sectors.
- Blanket Cooling Manifolds, F4E-OMF-1080 Task 3: Signature of Task 3 for the procurement of Chimney Pipes for Blanket Cooling Manifolds.

TARGET

The target for 2024 is “Annual M-SPI ≥ 0.8”

Action 4. In Vessel – Divertor

Action 4	In Vessel – Divertor
<p>The Divertor (including the Cassette Bodies and IVTs) will be requested for the first assembly phase. Schedule risk mitigation actions, requiring additional resources and budget, needed to increase the confidence in the delivery dates as requested by ITER Organisation, are being analysed but not yet included in this WP2024 amendment.</p>	
<p>Cassette Body project</p>	
<p><u>Progress of Work</u></p>	
<p>In 2024, both contractors of the Divertor Cassette Body (CB) Series will continue the manufacturing activities. The focus will also be given to the continuation of the manufacturing activities of the contract OPE-1036 related to the fabrication of the transition pieces and Remote Handling flanges. Concerning the contract OPE-1112 of Ancillary Items of Pins, Sleeves and Links of the CB Series, the engineering phase and procurement of materials will progress as well.</p>	
<p>The planned progress of work is subject to the requested allocation of internal resources.</p>	
<p><u>Procurement Activities</u></p>	
<p>In 2024, the main commercial activities foreseen will be the indexation related to the CB series fabrication, TCWS & RH Flanges, and Ancillary Items of Pins, Sleeves and Links. Additional external support (resident inspectors, metrology support, welding, etc.) will be provided through task orders under existing framework contracts. Commitments for specific purchase orders related to maintenance and calibration and training sessions of tools are planned.</p>	
<p>Additional commitments for schedule risk mitigation actions are not yet included in this WP2024 amendment.</p>	
<p>Inner Vertical Target project</p>	
<p><u>Progress of Work</u></p>	
<p>In 2024, the prototypes (under F4E-OMF-567) will be finished (after completion of HHF tests at Efremov Institute in Q4 2023).</p>	
<p>The IVT Series production activities will continue, after the signature of the first specific contract in December 2022 and the signature of the second specific contract is planned in 2024. Focus will be on engineering, construction of the production lines, and procurement of materials. External support on ultrasonic testing will be provided during the qualification and production phases of the IVT Series.</p>	
<p>Additional commitments for schedule risk mitigation actions are not yet included in this WP2024 amendment.</p>	
<p>The planned progress of work is subject to the requested allocation of internal resources.</p>	
<p><u>Procurement Activities</u></p>	
<p>In 2024, the main commitment foreseen is linked to the signature of the second specific contract for the IVT series. Release of options and commitments for indexations related to the IVT Series are planned.</p>	

Commitments for transportation of prototypes and test assembly are also planned (either through cash contribution to IO or under the manufacturing contracts).

Given the current geopolitical situation, alternative solutions may have to be initiated by F4E, should HHF testing in Russia be not possible in the timeframe compatible with the IVT Series procurement schedule.

External support will be needed to closely follow-up the fabrication of the IVT series contracts. These needs are planned to be provided through task orders under existing framework contracts.

Divertor Rails project

Progress of Work

The PA is planned for signature in early 2025.

It shall be noted that the 2024 progress will depend on the timely availability of the Procurement Arrangement documentation and signature of the PA.

The planned progress of work is subject to the requested allocation of internal resources.

Procurement Activities

N/A

WORK PROGRAMME OBJECTIVES

Milestone ID	Scope description	Forecast Achievement Date	Type of Milestone	PA/ITA
EU17.01.1175580	HP - Reception of the Load Test Report the SF1 (CB#16)	Q4 2024	WP24 objective	PA 1.7.P1.EU.01 Cassette Body
EU17.01.1367140	Manufacturing approved for PFC Links Series by MRR Panel (M_PISLLI_04)	Q4 2024	WP24 objective	PA 1.7.P1.EU.01 Cassette Body
EU17.2B.140230	Manufacturing approved for the IVT Series by MRR panel (OMF-1139-01-01)	Q4 2024	WP24 objective	PA 1.7.P2B.EU.01 Inner Vertical Target
EU17.2B.140310	OMF-1139-02-01 Signed for IVT Pre-Series and Series Stage I - OMF-1139-02-01	Q4 2024	WP24 objective	PA 1.7.P2B.EU.01 Inner Vertical Target

EXPECTED RESULTS

The main expected results for this action are:

1. Cassette Bodies, F4E-OMF-444: Hold Point – Reception of the Load Test Report the Support Frame #1 (Cassette Body#16)
2. Cassette Bodies, F4E-OMF-1112: Manufacturing approved for Plasma Facing Components Links Series by MRR Panel
3. Inner Vertical Targets, F4E-OMF-1139: Manufacturing approved for the IVT Series by MRR Panel (Specific Contract #1)
4. Inner Vertical Targets, F4E-OMF-1139: Signature of the Specific Contract #2 for the IVT series production

TARGET

The target for 2024 is "Annual M-SPI \geq 0.8"

Action 5. Remote Handling

Action 5	Remote Handling
<p data-bbox="238 331 792 367">Divertor Remote Handling System (DRHS)</p> <p data-bbox="238 384 457 417"><u>Progress of Work</u></p> <p data-bbox="238 436 1404 569">The focus will be given to the Final Design activities via two main development lines that will run in parallel: one for the Cassette Multifunctional Mover (CMM) and the other one for the Cassette Toroidal Mover (CTM). Final design activities will be accompanied with prototyping and laboratory test in some areas.</p> <p data-bbox="238 590 518 623"><u>Procurement Activities</u></p> <p data-bbox="238 644 1404 745">For both of the main development areas and the complementary activities, specific contracts will be launched through Remote Handling (RH) and Engineering Unit framework contracts. Contracts are also planned to be signed for final design and manufacturing.</p> <p data-bbox="238 821 894 856">Cask and Plug Remote Handling System (CPRHS)</p> <p data-bbox="238 873 457 907"><u>Progress of Work</u></p> <p data-bbox="238 926 1404 1094">Activities are organized in two parallel development lines. One focuses on the assembly casks that are first plasma components, the other one focuses on the nuclearized cask variants. Focus will be given to the manufacturing of the full scope of the first plasma systems. Final design activities will be accompanied with prototyping in some areas. Non-first plasma nuclearized casks will be continuing on the preliminary and final design development.</p> <p data-bbox="238 1115 518 1148"><u>Procurement Activities</u></p> <p data-bbox="238 1169 1404 1234">For both of the main development areas and the complementary activities, specific contracts will be launched through Remote Handling (RH) and Engineering Unit framework contracts.</p> <p data-bbox="238 1310 883 1346">Neutral Beam Remote Handling System (NBRHS)</p> <p data-bbox="238 1362 457 1396"><u>Progress of Work</u></p> <p data-bbox="238 1415 1404 1610">Activities are organized by subsystems and prioritized by their delivery needs for the different assembly stages. Main focus is given to the Monorail crane system that is first plasma item. Final design development and preparation for manufacturing of the Monorail crane system will continue, other non-first plasma systems will continue preliminary design developments towards design review. Final design activities will be accompanied with prototyping and laboratory test in some areas.</p> <p data-bbox="238 1631 518 1665"><u>Procurement Activities</u></p> <p data-bbox="238 1686 1404 1787">For the different development areas and the complementary activities, specific contracts will be launched through Remote Handling (RH) and Engineering Unit framework contracts. Contracts are also planned to be signed for final design and manufacturing.</p> <p data-bbox="238 1808 662 1843">In-vessel viewing system (IVVS)</p>	

Progress of Work

Main focus will be given to the final design development to move towards the design review and preparation for the manufacturing. Final design activities will be prepared/accompanied by manufacturing and testing in some areas.

Procurement Activities

For the different development areas and the complementary activities, specific contracts will be launched through Remote Handling (RH) and Engineering Unit framework contracts.

Common activities (transversal)

Progress of Work

Engineering support and expert activities will be performed for the four main operational activities, where needed. Complementary RH technology related design activities, qualification and prototyping will be carried out with a great focus on the field of control system, radiation hard technologies like electronics and cameras. Activities will be implemented (design and tests) aiming at manufacturing of first components (e.g. rad hard cameras and electronics) to be integrated in the RH systems.

Procurement Activities

Specific contracts will be launched through Remote Handling (RH) and Engineering Unit framework contracts in order to carry out supporting activities for the four main operational procurement and for complementary RH technology related design activities, qualification and prototyping. Contracts are also planned to be signed in some areas.

WORK PROGRAMME OBJECTIVES

Milestone ID	Scope Description	Forecast achievement date	Type of milestone	PA
EU23.03.14069040	CPRHS TO-577-02-02 Subtask 9 CDS Lift completed	Q3 2024	Predecessor of GB41	PA 2.3.P3.EU.01 Cask and Plug Remote Handling System
EU23.03.14074440	CPRHS OMF-1034-01-06 DDL-047 D2.5.02 Assembly Drawing CTS approved	Q4 2024	Predecessor of GB40	PA 2.3.P3.EU.01 Cask and Plug Remote Handling System
EU23.05.14054460	M6 - CDH Concept Design Review [OPE-1252]	Q3 2024	Predecessor of GB42	PA 2.3.P5.EU.01 Neutral Beam Remote Handling System
EU57.01.14062860	[M12] CMS Prototype tested successfully	Q4 2024	Predecessor of GB47	PA 5.7.P1.EU.01 In-Vessel Viewing System

EXPECTED RESULTS

The main expected results for this action are:

1. Tendering the DRHS FwC for Design, Manufacturing of CTM, CMM and Tooling
2. Preparation for the final design review meeting of CPRHS MA CES/CHS system

3. Final design development of NBRHS first plasma system
4. Final design development of IVVS Measurement and deployment system

TARGET

The target for 2024 is "Annual M-SPI \geq 0.8"

Action 6. Cryoplant and Fuel Cycle

Action 6	Cryoplant and Fuel Cycle
<p>Fuel cycle</p> <p><u>Progress of Work</u></p> <p>The type A radwaste treatment and storage system is expected to be transferred to IO.</p> <p>In the frame of the PA for REMS (Radiological and Environmental Monitoring Systems), the contract for design and manufacturing of individual monitoring system and environmental monitoring system needed for 1st plasma will focus on final design and manufacturing and formalization of contract changes to adapt the scope to the new ITER baseline. Task Orders related to Design and risk mitigation activities of REMs for Tokamak complex will continue and additional Preparation activities for specific Framework contract for REMS Tokamak are planned.</p> <p><u>Tritium plant:</u></p> <p>For Isotope separation system work of the integrated team will focus on definition of technical requirement, de-risking activities and preparation of procurement arrangement.</p> <p>For water detritiation system work of the integrated team will focus on definition of technical requirement, de-risking activities and preparation of procurement arrangement.</p> <p>For <u>vacuum pumping:</u></p> <p>Torus and Cryostat Cryopump system (TCCS) will focus on manufacturing and testing activities.</p> <p>The manufacturing of Neutral Beam scope for the Front-end Cryopump Distribution system (FECDS) will continue.</p> <p>The instrumentation and control (I&C) cubicles needed for 1st plasma scope for the TCCS and FECDS will be manufactured. The design activities for the I&C scope related to neutral beam FECDS will continue and contract to cover manufacturing phase will be signed (via new contract or amendment to an existing one).</p> <p>There is the possibility that this transfer is postponed to 2025.</p> <p>For Neutral beam cryopumps system, activities will focus on definition of technical requirements and preparation of procurement arrangement signature.</p> <p>Design and qualification of leak Detection systems will continue.</p> <p>Leak Localization systems manufacturing will be completed.</p>	

Procurement Activities fuel cycle

- Contract signature for manufacturing of Neutral Beam Cold Valve Boxes instrumentation and control (via amendment to an existing contract or a new specific contract) ⁷
- Specific contract signature for I&C Leak Detection
- Contract for Leak Detection long lead items/components.
- Amendment to an existing contract may be signed.
- Specific Contracts for support activities like Inspectors, Documentation Support, Engineering and Analysis, Project Management support etc, will continue to be issued depending on the project needs.

Cryoplant

Progress of Work

The commissioning of the LN2 Plant and Auxiliary Systems located in the Cryoplant building at Cadarache will continue.

Procurement Activities cryoplant

- Amendments to existing contracts may be signed.
- Specific Contracts for support activities like Inspectors, Documentation Support, Engineering and Analysis, Project Management support etc. will continue to be issued depending on the project needs.

WORK PROGRAMME OBJECTIVES

Milestone ID	Scope Description	Forecast achievement date	Type of milestone	PA
EU31.01.10261	IPL > Delivery of First Torus & Cryostat Cryopumps by EU-DA to ITER Site	Q2 2024	GB33	PA 3.1.P1.EU.03 Torus and Cryostat Cryopumps
EU31.01.12290	Strategy proposal of PA Amendment 3.1.P1.EU.04 for NB Cryopumps	Q3 2024	Predecessor of GB50	PA 3.1.P1.EU.04 Neutral Beam Cryopumps
EU31.03.25790	Pre-FDR completed for CDLDS and NBDLDS	Q4 2024	Predecessor of GB35	PA 3.1.P3.EU.01 Primary and Cryostat Leak Detection System

⁷ At the time of writing the Work Programme, there is a possibility that this commitment is signed in 2024 if it is done via amendment to an existing contract and in 2025 if it is signed as a new contract anticipated to 2023 via an amendment to an existing contract.. The budget is nevertheless allocated to 2024

EU31.03.26160	M.19 - FDR Meeting and categorize issues for Primary & Cryostat Leak Detection System	Q3 2024	Predecessor of GB35	PA 3.1.P3.EU.01 Primary and Cryostat Leak Detection System
EU31.03.40260	Cryostat Direct Leak Detection System qualification completed	Q4 2024	Predecessor of GB18	PA 3.1.P3.EU.01 Primary and Cryostat Leak Detection System
EXPECTED RESULTS				
<p>The main expected results for this action are:</p> <ol style="list-style-type: none"> 1. Leak localization system Factory Acceptance Tests will be completed. 2. Commissioning LN2 compressors completed. 3. First Torus and Cryostat cryopumps delivered. 4. Manufacturing readiness review for Neutral Beam Cold valve boxes completed. 5. Radiological and environmental monitoring system: Static magnetic field pre-testing for main Tritium monitors in Europe completed 6. Neutral Beam cryopumping system: agreement on main technical requirements needed as input for the final design review 7. Water detritiation system: agreement in the integrated team on the procurement arrangement approach 8. Isotope separation system: agreement in the integrated team on the procurement arrangement approach 				
TARGET				
The target for 2024 is "Annual M-SPI \geq 0.8"				

Action 7. Plasma Engineering & Operations

Action 7	Plasma Engineering & Operations
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ITER Operations

The activities preparation of ITER operation will focus on preparation for longer term actions (for ITER integrated commissioning and operation) as well as some short-term actions (for system commissioning and assembly phases)

The preparation of the F4E contribution to the organization of ITER Operation (collaboration framework with IO and the ITER parties, EU representation) includes contributing to the definition of the EU position in the definition of the ITER Operation organisation as well as setting up in F4E of framework for personnel assignment and of F4E coordinating mechanisms

Procurement Activities

Not applicable

Plasma Engineering

A relevant part of the PE activity responds to (often urgent) requests and hence it is difficult to plan in advance.

This will include support on scenario preparation for first plasma and specific simulations and code development as needed, support to the development of the ITER Tokamak Monitoring System. Transversal support to F4E procurement remains in the Plasma Engineering scope.

Procurement Activities				
Not applicable				
WORK PROGRAMME OBJECTIVES				
Milestone ID	Scope Description	Forecast achievement date	Type of milestone	ITA/PA
Not applicable				
EXPECTED RESULTS				
The main expected results for this action are:				
1. Provide support to ITER preparation for First Plasma.				
TARGET				
Not applicable				

Action 8. Heating & Current Drive

Action 8	Heating & Current Drive
Electron Cyclotron (EC) System Gyrotrons, Power Sources and Power Supplies (PS), EC Upper Launcher and EC Control System	
<u>Progress of Work</u>	
<u>EU EC Power Supplies</u> <ul style="list-style-type: none"> • Installation of the four remaining units of the EU EC Power Supply will be completed • Commissioning will continue subject to building and site interfaces availability • Technical support of the EU EC Power Supplies will continue 	
<u>EU EC Gyrotrons</u> <ul style="list-style-type: none"> • Design activities for the EU gyrotrons will progress towards preparation of the Final Design Review Work Plan and associated documentation Preparation activities for the Framework contract for the engineering support to the EU Gyrotrons and other EC systems will be completed • Preparation activities for the specific contract for the control system for the European Gyrotrons (FDR documentation) will be completed • Procurement of Long Lead components will start 	
<u>Electron Cyclotron (EC) Upper Launcher and ex-vessel waveguides</u> <ul style="list-style-type: none"> • The Contractor will proceed with the design of Ex-Vessel Waveguides and Upper Launcher (UL) Systems towards the finalization of the design 	

- Preparation activities for the subsequent specific contracts signature under the relevant framework contract covering the manufacturing and assembly of the Ex-Vessel Systems and the manufacturing of the remaining UL Sub-systems will progress
- Procurement of long lead materials for series production will start
- Optical testing of diamond disks will continue
- The design, validation and manufacturing of the isolation valve prototypes and valve qualification will start

Electron Cyclotron Control System

- In recent negotiations with ITER IO it was decided to join the FDR of the Electron Cyclotron Plant Controller (ECPC) and of the Upper Launcher Subsystem Control Unit (EC-UL-SCU). The FDR, considering the ITER re-baseline, is presently planned in 2028. Therefore, in 2024 the activity will focus on the commissioning of the delivered systems and will include preparation for future FDR of the ECPC Stage 3 system and of EC-UL-SCU Stage 2.

Procurement Activities

Common activities:

- The framework for engineering support services for EC projects will be signed
- Some Engineering Studies and Engineering Support activities will be performed, implemented via ITAs
- Other contracts are foreseen to support these main activities (e.g., engineering, design, analyses, resources, inspectors, prototyping), most of them specific contracts under existing frameworks and expert contracts

Electron Cyclotron (EC) Power Supplies:

- Supporting activities for site support are foreseen

Electron Cyclotron (EC) Gyrotrons:

- The Task Order for Technical Follow-up of Gyrotron Tubes & Super Conducting Magnets for the EU Gyrotrons will be signed
- The Task Order for the FDR documentation of the EU Gyrotrons Control System will be signed

Electron Cyclotron (EC) Upper Launcher and ex-vessel waveguides

- The Contract for the design finalization of the isolation valves including manufacturing of two prototypes will be signed
- Task Orders for the testing of the diamond window unit prototype will be signed
- Task Orders for additional RF testing will be signed
- Additional options and Task Orders under the relevant Framework Contract for the Design Finalization and Supply of the Electron Cyclotron Upper Launchers and Ex-Vessel Waveguides for ITER will be signed, covering part of the remaining scope (e.g., material procurement for series production)

Electron Cyclotron Control System:

- Task Orders for the preparation of the FDR under existing Frameworks will be signed

- Task Orders for HW prototypes under existing Frameworks will be signed

Neutral Beam Test Facility, Padua:

Progress of Work

- MITICA Beam Source – Repairing and Assembly continuation foreseen during 2024
- MITICA Diagnostics – Fabrication will be completed and assembly will progress
- MITICA Beam Line Components – Delivery of Neutralizer (NED) to the NBTF will be completed, assembly and testing activities of Electrostatic Residual Ion Dump (ERID) and Calorimeter (CAL) will progress towards Factory Acceptance Test
- NBTF Assembly - MITICA cryopump assembly tool will be delivered
- NBTF Assembly - MITICA cryopump installation preparation will start
- NBTF Control System (CODAS) - MITICA instrumentation (Interlock and Safety System) manufacturing will start

Procurement Activities

- Some Engineering Studies and Engineering Support activities will be performed, implemented via ITAs
- Other contracts are foreseen to support the main activities (e.g., engineering, resources, inspectors), most of them specific contracts under existing frameworks and expert contracts
- MITICA Beam Line Component and Beam Source: supporting tasks for the final acceptance tests and delivery to RFX PRIMA site will be implemented.
- Specific contracts will be signed for the NB Test Facility within PRIMA Assembly Framework.

Neutral Beam for ITER - Cadarache:

Progress of Work

- HNB Vessels: Manufacturing design activities will proceed up to MRR
- HNB Beam Sources and Beam Line Components – Pre-procurement activities and PA preparation will progress subject to priorities and resource availability (Update of the technical specifications for the HNB units based on MITICA lessons learned)
- HNB Drift-Ducts: Preparation of technical documentation will proceed and the procedure will be launched
- HNB Absolute Valves: Technical specifications for the feasibility study will be finished and feasibility studies by tenderers will start under the lead of IO
- PMS and ACC Coils: PA preparation activities for 53.05 Neutral Beam Magnetic Shielding will progress and tendering preparatory activities for contract signature will start.
- NB Power Supplies: Detailed design activities for ISEPS will start for ITER, and first deliveries of AGPS-CS and GRPS will take place. High voltage deck and bushing assembly manufacturing activities will be completed. Engineering activities for ITER Heating Neutral Beam (IHNB) control system will start.
- Assembly Tooling: Procurement procedure for the supply of the assembly tools for ITER will proceed up to the contract signature.

Procurement Activities

- Some Engineering Studies and Engineering Support activities will be performed, implemented via ITAs
- Other contracts are foreseen to support the main activities (e.g., engineering, design, analysis, resources, inspectors), most of them specific contracts under existing frameworks and expert contracts
- HNB Absolute valves: A cash contribution will be made to IO in order to fund a feasibility study (to be led by IO) to widen the market on the NB absolute valves
- NB Power Supplies: Specific tasks and options will be released, in accordance with the contract implementation status
- Assembly Tooling: The contract for the assembly tooling for ITER will be signed

Ion Cyclotron Antenna

No activities are foreseen in 2024.

Following agreement between F4E and IO, the IC antenna procurement scope was transferred through a Level-0 PCR (#1271) from the original share of F4E, without contractual impact, since the PA had not yet been signed.

WORK PROGRAMME OBJECTIVES

Milestone ID	Scope Description	Forecast achievement date	Type of milestone	PA
EU52.01.3000010	Option 1 Signed for TO1 for Design Finalization, Manufacturing & Assembly of the EC UL Port Plug	Q2 2024	Predecessor of GB46	PA 5.2.P1B.EU.02 Electron Cyclotron Upper Launcher
EU52.01.4001240	EC Upper Launcher - Design Description Document for UL system - Completed	Q3 2024	Predecessor of GB46	PA 5.2.P1B.EU.02 Electron Cyclotron Upper Launcher
EU52.03.17200	Task Order Signed for Technical Follow-up of Gyrotron Tubes & Super Conducting Magnets	Q4 2024	WP24 objective	PA 5.2.P3.EU.01 Electron Cyclotron Gyrotrons
EU53.TF.4446460	Delivery On-Site Completed (M89) - MITICA Neutralizer	Q3 2024	WP24 objective	PA 5.3.P9.EU.01 Neutral Beam Test Facility Components

EXPECTED RESULTS

The main expected results for this action are:

1. Finalization of the design for the UL System
2. Optical testing to be completed for 44 diamond disks
3. Ground Related Power Supply (GRPS) first delivery to ITER site
4. Acceleration Grid Power Supply – Conversion System (AGPS-CS) first delivery to ITER site
5. ISEPS design started
6. HV bushing assembly manufacturing completed

TARGET

The target for 2024 is “Annual M-SPI ≥ 0.8”

Action 9. Diagnostics

Action 9	Diagnostics			
<p><u>Progress of Work</u></p> <p>The Diagnostics Programme will continue during 2024 with the manufacture of several components or systems for delivery to ITER, mostly for the Start of Research Operations (SRO). These include mainly in-vessel supports, in-vessel cables and vacuum vessel feedthroughs, some of which will be delivered within the year. Manufacturing of fission chambers for the radial neutron camera will also begin.</p> <p>Preliminary and final design review meetings will be held for several of the Diagnostics systems and subsystems. For the equatorial visible/IR wide-angle viewing system of equatorial port 12, final design will be completed for both ex-vessel components and for electronics and software with approval to close the corresponding final design reviews.</p> <p>Design of the radial neutron camera, the diagnostic pressure gauges and the port-mounted bolometer cameras will progress within existing framework partnership agreements. Design of the equatorial visible/IR wide-angle viewing system for equatorial ports 3, 9 and 17 will progress under an existing design grant. Design of the remaining systems and sub-systems will progress under task orders within existing design framework contracts or, for the in-divertor electrical services, within an existing contract.</p> <p>For port structures and the integration of Diagnostics into the ports, works will continue to address change requests to the approved FDR design, associated with changes to the design of tenant systems in the ports as well as to integrate glow discharge electrodes newly required for boronisation of the tungsten first wall in ITER .</p> <p><u>Procurement Activities</u></p> <p>Procurement activities will focus mainly on the preparation for, and tendering process of framework contracts with scope that includes manufacture of several systems or sub-systems needed for SRO, as well as on placement of task orders for manufacture of SRO components within existing framework contracts. Task orders will also be placed within existing framework contracts to support updates to the design integration for the ports, prior to preparation of specifications for tender of manufacture of the first port systems.</p> <p>These will be complemented with contracts and task orders for the production and testing of prototypes and task orders for the provision of industrial expertise and for engineering analysis, as well as amendments of on-going grants and contracts (including specific contracts) as necessary. In-sourcing of personnel is foreseen to support the Programme during 2024, as is the use of Inspectors for manufacturing contracts and Experts in specialist areas, including in support of design reviews.</p> <p>It has been foreseen a possible cash transfer to IO related to the AG magnetic sensors brazing activities prior added to F4E scope via PCR-1411 and currently foreseen to be performed by IO.</p>				
WORK PROGRAMME OBJECTIVES				
Milestone ID	Scope Description	Forecast achievement date	Type of milestone	PA

EU55.02.109200	FDR Meeting and categorize issues for Port-plug-mounted Bolometer Cameras (EPP01)	Q4 2024	WP24 objective	PA 5.5.P1.EU.03 Diagnostics - Bolometers
EU55.02.226450	PDR Panel Approval of Chit Resolution Plan for VV & DIV Cameras	Q4 2024	WP24 objective	PA 5.5.P1.EU.03 Diagnostics - Bolometers
EU55.06.697220	IPL > Delivery of in-vessel cables for VV Sector 3 (Batch 7) by EU-DA to IO ITER site	Q4 2024	WP24 objective	PA 5.5.P1.EU.18 Diagnostics - Tokamak Services
EU55.06.707200	PQMP Vactron Approved	Q4 2024	Predecessor of GB36	PA 5.5.P1.EU.18 Diagnostics - Tokamak Services
EU55.11.205760	Approval of chit close-out action plan for resolution of CAT-1 chits raised at PDR for ExV Components	Q3 2024	WP24 objective	PA 5.5.P1.EU.04 Diagnostics - Core-Plasma Charge Exchange Recombination Spectrometer
EXPECTED RESULTS				
The main expected results for this action are:				
<ol style="list-style-type: none"> 1. Completion of final design for equatorial visible/IR wide-angle viewing system for equatorial port 12 ex-vessel components. 2. Completion of final design for equatorial visible/IR wide-angle viewing system for equatorial port 12 electronics and software. 3. Deliveries of tokamak services in-vessel supports. 4. Deliveries of tokamak services in-vessel cables 				
TARGET				
The target for 2024 is "Annual M-SPI \geq 0.8"				

Action 10. Test Blanket Module

Action 10	Test Blanket Module
<p><u>Progress of Work</u></p> <p>The Design and Safety Analysis activities for TBM Sets and Ancillary Systems will continue for the completion of the preliminary design and the first step of the final design.</p> <p>The consultancy of an Agreed Notified Body will continue as well as the handling and storage of EUROFER and other steel products.</p> <p>The activities for the development of the TBM sets Industrial Feasibility and Fabrication Technologies will continue, as well as for the EUROFER semi-finished product.</p> <p>The collaboration with EUROfusion and EFLs will continue.</p> <p>The definition and codification of EUROFER design limits in RCC-MRx design and construction code will continue.</p> <p><u>Procurement Activities</u></p>	

It is planned to launch/conclude procurement procedures for the start or the continuation of the following activities among others:

- Completion of the preliminary design of the TBM sets, of Ancillary Systems and of the related Safety Analyses and studies;
- Preparation of the final design of the TBM sets and of the related safety analyses and studies;
- Preparation of the final design and manufacturing of the Ancillary systems;
- Continuation of the Consultancy support by an Agreed Notified Body;
- Proof of the TBM-sets fabrication and assembly processes feasibility;
- EUROFER semi-finished products;
- Handling and Storage of EUROFER and steel materials;
- Definition and codification of EUROFER design limits in RCC-MRx;
- The transport of EUROFER and other materials/products to and from the storage facility.

In addition, specific contracts for support activities like engineering and analysis, experts, project management support, system engineering management and in-sourced staff may be issued depending on the project needs.

Moreover, if requested and approved by the TBM-Project Team Steering Committee, a cash contribution has to be transferred to IO in order to execute TBM-PT activities common to several ITER Members.

The Test Blanket Module Systems procurement plan is not in response to PA or ITA but to the TBM Arrangements (TBMAs).

No activities are credited.

WORK PROGRAMME OBJECTIVES

Milestone ID	Scope Description	Forecast achievement date	Type of milestone	PA
EU56.01.1242855	Task Order Signed for TO1 for FwC for EUROFER design limits codification in RCC-MRx	Q4 2024	WP24 objective	NA
EU56.01.1259955	Task Order Signed for TO2 for Safety Studies in support of TBSs PD & FD	Q4 2024	WP24 objective	NA
EU56.01.1326800	TO 05 Signed for Preliminary Design HCPB TBS Ancillary Systems	Q3 2024	WP24 objective	NA
EU56.01.1327040	F4E-OFC-0950-01 Task Order 05 Signed for HCCP TBM set for PDR.	Q4 2024	WP24 objective	NA
EU56.02.1240200	TO4 Signed for Handling, Cutting Storage Serv for Steel Products related to the EU TBMs	Q1 2024	WP24 objective	NA

EU56.03.1262300	Task Order Signed for TO 04 for WCLL Ancillary Systems PD	Q4 2024	WP24 objective	NA
EXPECTED RESULTS				
The main expected results for this action are:				
<ol style="list-style-type: none"> 1. Continuation of the Preliminary design activities for WCLL TBS and the start-up of Final design phase. 2. Continuation of the Preliminary design activities for HCCP TBS in collaboration with KO-DA and the start-up of Final design phase. 3. Transmission to IO of the consolidated set of data in view of the update of the ITER Preliminary safety Report. 				
TARGET				
The target for 2024 is "Annual M-SPI \geq 0.8"				

Action 11. Site and Buildings and Power Supplies

Action 11	Site and Buildings and Power Supplies
<i>Progress of Work</i>	
<p>The focus of the Buildings works will be to complete the civil works of the Tritium building (B14); to deliver the Tritium building (B14) available for IO equipment installation up to R1 level including the painting works; to progress on the procurement and installation of the cargo lift in the Tokamak building (B11); to progress on design, qualification, delivery and installation of the doors in the Tritium building (B14); to complete the Fast Discharge & Switching Network Resistor building (B75), the Hot Water Boilers Building (B62) the Busbar Bridges (M1 and M2) and the Cryoline Bridge.</p> <p>The Emergency Power Supply Buildings (B44, B46), Medium Voltage Distribution Buildings (B45, B47) Civil Works and finishings will be completed. The Load Centers LC01, LC02, LC04, LC08, LC09, LC15 & LC16 and the Medium Voltage MV04, MV05 & MV06, construction will continue progressing.</p>	
<i>Procurement Activities</i>	
New contracts to be signed by 2024 include:	
<ul style="list-style-type: none"> • AE II - Contract Architect Engineer Services II Q4 2024 • TB25 – Site Infrastructure and remaining Building services in the auxiliary buildings Q4 2024 	
Amendments to running contracts:	
<ul style="list-style-type: none"> • Amendment with IO: Amendment 2 on Special Contribution Agreement to Partial Novation agreement to be signed Q2 2024. • Amendment 9 to the OPE-025 Contract to be signed in Q2 2024 	
<p>Specific contracts will be signed under ongoing framework support services and works contracts. This includes, for example, Task Orders, Facility Management, Site Security and Reception Services, Structural analysis, Building HMI Development, Engineering and Contract Management Consultancy Services (with special respect to cost and schedule assessment) and consultancy for advice on interpretation of French Regulatory Law 2012.</p>	

Changes and exercise of options to the ongoing services and construction contracts in relation with PCRs, input data delays, and re-allocation of scope between contracts, will be implemented through amendments to the ongoing contracts in line with the provisions of the Financial Regulation.

Cash contribution will cover the ITER site host agreement and the ITER Site Services Agreement.

Specific cash compensation to IO as required in case of transfer of some activities from F4E to IO

WORK PROGRAMME OBJECTIVES

Milestone ID	Scope Description	Forecast achievement date	Type of milestone	PA
EU62.05.460	IPL > Construction of Cryoplant Coldbox Building (52) Completed	Q3 2024	GB21	MAIN MILESTONES
EU62.604260	Construction of 2 Bus-Bar Bridges (between B32 &74 and B33 &74) Completed	Q3 2024	GB58	AUX BUILDINGS D&B TB12
EU62.886781	Civil works completed for MV Distribution Bldg LC/2B (47) - Level 4	Q3 2024	WP24 objective	AUX BUILDINGS D&B TB13
EU62.05.620	IPL > Construction of Fast Discharge & Switching Network Resistor Building (75) Completed	Q4 2024	WP24 objective	MAIN MILESTONES

EXPECTED RESULTS

The main expected results for this action are:

1. To deliver the Cryoplant Coldbox Building (52) to IO
2. To deliver the Busbar bridges 32-74, 33-74 to the IO for its suppliers works (ready for equipment - RFE)
3. To complete Civil works for MV Distribution Bldg LC/2B (47) - Level 4 (after main civil works achieved on December 2023: steel works, parapets, support external panel, plasterboard panels).
4. Construction completed on the Fast Discharge & Switching Network Resistor Building (75)

TARGET

The target for 2024 is "Annual M-SPI \geq 0.8"

Action 12. Cash Contributions

Action 12	Cash Contributions			
<p>Cash contribution to IO</p> <p>This action covers the EURATOM in-cash contribution that F4E⁹ shall deliver to ITER International Organisation (IO) in cash together with its contribution in-kind for the ITER project in accordance with ITER Agreement¹⁰.</p> <p>The present Work Programme includes the cash contributions to IO due by F4E for the following year N+1. The whole amount is committed in advance based on estimates of the IO draft budget N+1 and under the terms approved by ITER Council¹¹.</p> <p>Cash Contribution to Japan</p> <p>The action also covers the transfer of procurement responsibility from EURATOM to Japan under the supervision of the ITER Organization in accordance with ITER Agreement. This is financed through a cash contribution from EU to Japan paid by F4E. An update of the schedule of payments is provided by the Japanese Domestic Agency (JA DA) twice a year.</p>				
WORK PROGRAMME OBJECTIVES				
Milestone	Scope Description	Forecast achievement date	Type of milestone	PA
EUCC.01.280	Cash Contributions to ITER Organization 2025	Q4 2024	WP24 objective	NA
EXPECTED RESULTS				
<p>The expected result for this Action is to pay to IO the cash contribution as agreed by the ITER Council and to Japan as defined in the schedule for the relevant credits assigned to JA DA for those components transferred by the EU to them. The target for 2024 is to commit the cash contribution to IO for 2025 according to the decisions due to be taken by the ITER Council in November 2024.</p> <p>There are no commitments planned in 2024 for Cash contribution to Japan.</p> <p>Annual M-SPI NA</p>				

⁹ F4E is the European Domestic Agency that manages the EURATOM contribution to the ITER project.

¹⁰ Article 8 "Resources of ITER Organization" (ITER Agreement 2006)

¹¹ According to Article 9 of ITER Agreement, the ITER Project Resource Management Regulations (PRMR Regulations) shall govern the administration of the resources of the ITER Organization. It provides a detailed description of the applicable rules for contributions in kind, cash income, commitments and payments for the ITER Organization. The final figures are approved or modified by the ITER Council.

Action 13. Technical Support Activities

Action 13	Technical Support Activities
<p>The procurement of the supporting activities is mainly performed through Framework contracts and specific contracts.</p> <p>Technical Support to In-Kind Procurement</p> <p>Engineering Support activities</p> <p><u>Progress of Work:</u></p> <p>The Engineering Unit during 2024 will continue supporting the ITER Departments Programmes including BA department by providing them technical expertise in the key domains of engineering and fusion technologies. The unit will provide technical expertise in the following areas: Design office activities, Technical Data Management, System Design, Mechanical Engineering, Analysis: Mechanical, Structural Dynamics, Civil engineering, Fluid Dynamics, Electro Magnetism, Nuclear Analyses; Plasma Engineering, Design Codes and Standards; Electrical Engineering; Instrumentation and Control; CODAC; Metrology, Material and Fabrication and Assembly Integration and Validation (AIV) and testing facility (FALCON).</p> <p>The Engineering Unit during 2024 will start the new Technologies Development Program by assessing key enabling fusion technology development needs and launching potential partnerships with industry to develop top priority technology development actions.</p> <p><u>Procurement Activities:</u></p> <p>Beyond the preparation of task orders, the procurement activities in the Engineering Unit will be mainly focused on renewing Framework Contracts, for adapting the level of support to the needs of the Programmes. Grants may also be signed for various actions.</p> <p>Nuclear Safety</p> <p><u>Progress of Work</u></p> <p>The scope includes the oversight of the implementation of all nuclear safety requirements by F4E and its contractors. The Nuclear Safety activities also provides support to the project teams involved in PIC/PIA (Protection Important Components/Activities) to ensure compliance with the necessary regulation. This includes support to nuclear safety management, identification of optimum positions for key nuclear safety issues, review of relevant documentation and nuclear safety inspections in F4E suppliers' premises. The Nuclear Safety Unit also organizes workshops, seminars and other activities to raise and re-enforce the nuclear safety awareness within F4E.</p> <p>In case F4E will seek for a ISO19443 certification, Nuclear Safety Unit will provide support and participate in these activities.</p> <p><u>Procurement Activities</u></p> <p>A framework contract will be signed for the implementation of Nuclear Safety inspections and dedicated Task Orders will be issued to provide this support in F4E suppliers' premises. Task Orders under the framework contract for Nuclear Safety support services will be issued and will</p>	

continue to assist the F4E Project Teams both in Barcelona and in Cadarache. F4E will be supported by experts on Nuclear Safety expertise, funded by F4E through expert contracts. All other activities will be implemented through Task Orders or Purchased Orders or Procurement Procedure for Direct Service Contracts based on the needs.

Quality Assurance and Quality Control

Progress of Work

The scope includes the support to project teams to ensure that the F4E quality requirements are correctly implemented and managed for the F4E contribution to ITER. In particular, support is provided in both domains of Quality Assurance (QA) and Quality Control (QC). As for QA, support aims at ensuring that F4E's QA processes are properly followed in the development of the different ITER projects and in line with the F4E Quality Management Policy. As for QC, the support to the projects will be provided in the follow-up and control of the activities performed by F4E's contractors.

In case F4E will seek for a ISO19443 certification, Quality Assurance Unit will provide support and participate in these activities.

Procurement Activities

A framework contract will be signed for the continuation of Quality Control Inspectors for Protection Important Components (PIC) of ITER Project. Task Orders will be issued and, as well, Options of Task Orders already in force will be released for both the QA and QC activities.

CE Marking

Progress of Work

The scope includes the support to F4E Project Teams in providing assessments and reviews, for each PBS, of the compliance with CE marking directives & regulations (mainly Pressure Equipment Directive, Machinery Directive, Low Voltage Directive, Electromagnetic Compatibility Directive, Explosion Protection and Construction Product Regulation).

Procurement Activities

Task Orders will be issued for the CE Marking activities.

Systems Engineering

Progress of Work

The scope includes the development and implementation of Systems Engineering practices, processes and tools and to support their correct deployment by the Project Teams. To cover this scope, external manpower is contracted across several areas, including Requirements Management and Verification (RMV) with emphasis on Verification, Design and Manufacturing Readiness Reviews, Interface Management, and other Systems Engineering topics.

Procurement Activities

Task Orders will be issued and contractual Options will be released as well in Task Orders already in force to continue to support the F4E Project Teams both in Barcelona and in Cadarache.

Office of the Chief Engineer

Progress of Work

The Office of the Chief Engineer supports the Head of ITER Programme Department with respect to the scope of the EU in-kind components for ITER and in representing F4E towards the ITER Organisation. Among the main tasks are: the interaction with IO on the project technical baseline, including change control, and participation to the Configuration Control Boards, the management of transversal technical issues impacting several PTs, the coordination of F4E participation to ITER Independent Reviews and working groups focused on technical matters and the assurance of consistency, adequacy and maturity in relevant Design Reviews.

Procurement Activities

Task Orders under existing framework contracts will be issued and, as well, Options of Task Orders already in force will be released to continue to complement the in-house Configuration Management, Technical Integration and Issues Management capabilities with expert support from specialized companies.

WORK PROGRAMME OBJECTIVES

Milestone ID	Scope Description	Forecast achievement date	Type of milestone	PA
EU.ES.01.99200	Published Call for Tender for Provision of CAD Design Support Services	Q2 2024	WP24 objective	All
EU.ES.02.95640	FWC OMF-TBD for Provision of Support in the Area of Nuclear Analysis signed	Q4 2024	WP24 objective	All
EU.ES.03.63480	Published Call for Tender for I&C integration services	Q4 2024	WP24 objective	All
EU.NS.01.35080	Framework Contract F4E-OMF-1532 signed for Nuclear Safety Inspections Support	Q2 2024	WP24 objective	All
EU.PE.6103150	Amendment Signed for Plasma Engineering Studies Part I – Modelling for load specifications	Q3 2024	WP24 objective	All
EU.PE.6103530	Contract Signed for Plasma Engineering Studies Part II	Q4 2024	WP24 objective	All
EU.PM.3142420	Framework Contract F4E-OMF-1544 signed for Quality Control Inspectors for Protection Important Components (PIC) of ITER Project	Q2 2024	WP24 objective	All

EXPECTED RESULTS

The main expected results for this action are:

1. Continuation of Implementation of the framework contracts which will allow Fusion for Energy to get external support in the field of Area of Nuclear Analysis and Neutronics, CAD Design.
 2. Signing of initial contracts with industry for the development of key enabling technologies as per technology mapping set priorities.
 3. Signature of a new Framework contract to provide support services in the area of Nuclear Safety inspections.
 4. Signature of a new Framework contract to continue to provide support services in the area of Quality Control Inspectors for Protection Important Components (PIC) of ITER Project .
 5. The expected result for the activities in Nuclear Safety, Quality Assurance & Quality Control, CE Marking and Systems Engineering is to provide the requested support to all Project Teams on these matters.
- In general, the target for 2024 is to contribute in achieving the cumulative credit forecasted for each action in this WP2024 thanks to the support granted to the work under each specific action.
6. The expected result for the activities performed by the Office of the Chief Engineer is to provide the requested support to the Head of the Department and to all Project Teams on the matters described in the Scope of Work. In general, the target for 2024 is to keep safeguarding the EURATOM's investment in ITER while achieving the cumulative credit forecasted for each action in this WP2023 thanks to the support granted to the work under each specific action.

Transportation

Transportation

Progress of work:

During 2024, Engineering Unit/Transportation will be in charge of the management, on the F4E side, of technical aspects of the joint procurement with IO for the transportation of ITER components to the site in Cadarache. The scope includes the transportation of all ITER Components from the port/airport of entry (Fos or Marignane) to ITER site. During 2024, this activity will mainly cover transportation of NON EU loads between Fos and Cadarache (EU-leg). The main cost driver is for Highly Exceptional Loads (HEL) that follow the dedicated ITER itinerary.

Procurement activities:

Task Orders for Transportation of Highly Exceptional Loads between Maritime Port of Marseille and ITER site. Gendarmerie Task Orders to escort the HEL convoys and Task Orders for Management fees and for component transportation with contractor Daher will be signed.

WORK PROGRAMME OBJECTIVES

Milestone ID	Scope Description	Forecast achievement date	Type of milestone	PA
EU.TR.406040	Task Order Signed for TO 20 for Convention 4 for	Q2 2024	WP24 objective	All

	Real Convoys for Gendarmerie Services			
EU.TR.406280	Task Order Signed for TO 21 for Convention 4 for Real Convoys for Gendarmerie Services	Q4 2024	WP24 objective	All

EXPECTED RESULTS

1. Transportation of Highly Exceptional Loads amongst others and EU and KO-DA VV-sectors between Maritime Port of Marseille and ITER site.
2. Gendarmerie Task Orders to escort the HEL convoys and Task Orders for Management fees and for component transportation with contractor Daher will be signed.

Other Technical Support and Administrative Activities

Programme Management

Progress of Work

The main focus of Programme Management is on performance monitoring and reporting, preparation of the annual and multi-annual programme planning documents, scheduling support, change control, the maintenance and update of the cost situation, the continuous improvement of the risk registers in all project areas, increased standardization of reporting within the organization, the implementation of the Internal Compliance Programme for export control. Overall project management support and support to the use and maintenance of specific tools to support project and program management are also included.

Procurement Activities

Task Orders and contractual Options of Task Orders already in force, Purchased Orders and Procurement Procedure for Direct Service Contracts will be issued to continue to support the F4E Project Management Department and F4E Project Teams at Barcelona and Cadarache or at suppliers' premises.

Administration (IT, POI, LSU, CSU and Finance)

Progress of Work

A general provision is foreseen for technical support activities, including operational consultancy, legal, logistics and assurance services, improvement and change projects related to technical processes or documentation management system of technical documents. The action also includes operational meetings, missions as well as hardware and software tools used for the direct benefit of the operational projects .

Procurement ActivitiesU

The above scope will be implemented mainly by issuing Task Orders under existing/new framework contracts.

Commercial (Insurance, CMP & CMM)

Progress of Work

A general provision is foreseen for operational support to F4E Programme Teams in Pre-procurement (this covers Business Intelligence & Market Analysis), Commercial Reporting, Procurement areas and Commercial contract management.

This part also includes insurances related to risk occurring during construction activities on the ITER Site such as All Risk Insurance, Third Party liability, Faulty Design insurance. It does not include Decennial insurance, Third Party liability related to the escort of convoys of component transport to ITER Site .

Procurement Activities

The above scope will be implemented mainly by issuing Task Orders under existing/new framework contracts.

Insurances will be mainly implemented via reimbursement of IO according to the Agreement on provision of insurance services signed 20/07/2020 and its renewal/extension. For insurances not falling in the scope of this scheme, such as decennial insurance for buildings, complement to F4E Third Party Liability, they are procured or renewed by F4E directly.

EXPECTED RESULTS

1. On time signature of the required Task Orders in order to support the Project Teams.
2. Provide high quality Project Management Support Services to all Project Teams.
3. The expected result for is to provide the requested support to F4E and all Project Teams on matters concerning Programme management.
4. The expected result for this Action is to provide the requested support to all Project Teams on matters concerning additional services (i.e. logistics, ICT, legal, POI, etc.) and to provide the requested support to all Project Teams on Operational Support Services and Insurance.

Annual M-SPI NA

Action 14. Broader Approach

Action 14	Broader Approach
<p>JT-60SA</p> <p><u>Progress of Work</u></p> <p>The implementation of activities for the Operation/Enhancement phase of the project will continue. These activities include the procurement of critical spare parts and engineering services for EU already supplied systems and components, and selected machine enhancements and diagnostics in collaboration with EUROfusion (including maintenance and assistance to on-site assembly and commissioning). F4E is expected to take a larger role for machine on-condition maintenance and repair.</p> <p><u>Procurement Activities</u></p> <p>In year 2024 several contracts for the maintenance and spare parts are planned to be launched. These contracts cover all components supplied by the EU i.e., cryoplant, electron cyclotron resonance heating and magnet power supplies.</p> <p>In the frame of capital protection activities and safety, contracts will be placed for the enhancement of the magnets active protection system in 2024.</p> <p>As implementation of existing procurement arrangements, the contracts for the integration of cassette bodies, the high heat flux and normal heat flux elements of the JT-60SA actively cooled</p>	

divertor, several studies and procurements for the enhancements of the power supply systems and the cryoplant will also be launched in 2024. Many of the activities under the responsibility of F4E are carried out through task orders of existing/new framework contracts or existing/new supply and service contracts. F4E will be continuously supported by experts, and on-site health and safety services to ensure safe operations, funded respectively by F4E through expert contracts and specific contracts. Specific contracts for support activities like engineering, inspections and analysis will be issued depending on the project needs.

Beyond the cash contributions yearly transferred on the basis of the STP Work Programme on specific QST call for funds (covering EU Contribution to operation, maintenance and assembly) additional cash transfers for partial funding of machine insulation repair activities (i.e. central solenoid extraction and repair) and the radio frequency transmission lines are also expected to be made.

IFMIF/EVEDA

Progress of Work

In 2024 the LIPAc (Linear IFMIF Prototype Accelerator) activities at Rokkasho will focus on finalizing the assembly of the superconducting part (cryomodule) of the LIPAc accelerator and integrating it into the beam line. The assembly will be continued on Rokkasho site by a European company under responsibility of F4E. After the assembly in the clean room has been completed, the cryomodule will be moved to the accelerator vault, in the LIPAc building, for the final steps of the assembly, the integration into the beam line and then the checkout tests. The LIPAc accelerator will be then in its final configuration for the last stages of the beam operation campaigns aiming at demonstrating the nominal performance of the LIPAc accelerator. In parallel, the enhancement activities for the LIPAc injector, Control System and RF Power system of the RFQ will be carried out to improve their maintainability, reliability, and availability. In particular the prototype of the new solid state RF power amplifier will be tested. The enhanced subsystems are planned to be deployed after the completion of the LIPAc primary goal, namely, full demonstration of the IFMIF accelerator concept for a fusion neutron source (acceleration and transport of a 9-MeV, 125-mA deuteron beam meeting the beam characteristics requirements in continuous waves) and will aim to demonstrate both the reliability and availability required for the future Fusion Neutron Source.

Procurement Activities

Contracts will have to be placed for the enhancement of key LIPAc subsystems and components such as the injector, the RF power system, and the control systems, as well as for demonstrating the operation and for optimizing the maintainability of the accelerator and subsequently the beam availability. Further contracts cover procurement of spare parts and services necessary for maintenance. Activities for the preparation of the LIPAc accelerator in its final configuration for the forthcoming operation phases will continue in 2024. F4E will be continuously supported by experts, and on-site health and safety services to ensure safe operations, funded respectively by F4E through expert contracts, specific contracts, Agreements of Collaboration with European Institutes, and a multi annual programme plan signed with EUROfusion. Cash contributions as contribution to Common Fund and Common Expenses will also be made.

IFERC

Progress of Work

The IFERC project comprises three activities, CSC (Computer Simulation Centre), REC (Remote experimentation Centre) and DEMO design and R&D:

The CSC objective is to provide high power computer (HPC) resources for JA and EU scientists in order to advance simulation studies for ITER, JT-60SA and fusion reactors in general (e.g. DEMO). CSC fosters collaboration research projects between JA and EU by sharing computer resources and by further jointly developing state-of-the art models. A collaboration with ITER for high priority simulation projects will continue.

REC activities focus on the implementation of the remote collaboration tools agreed with JT-60SA, ITER, and the IFMIF-EVEDA LIPAc accelerator. The collaboration under the ITER BA agreement continues to advance test technologies for remote experiments and data transfer, including remote CODAC application testing, remote data access, live data viewing for ITER, fast data transfer, and secure remote connection.

In the DEMO design activities, priority is given to activities relevant for ITER and JT-60SA exploitation, such as plasma scenario development, divertor and power exhaust, breeding blanket and tritium extraction and removal. The objective of activities in fusion materials R&D is to continue to support ITER in issues related to Tritium retention in first wall materials, and to contribute to the materials database for future reactors such as DEMO, which will be in part validated in a future IFMIF type installation. All activities are performed in collaboration with EUROfusion.

Procurement Activities

There are contracts to be placed for preparation of remote participation rooms for tests with BA Projects and ITER, and testing activities. F4E will be supported by experts, funded by F4E through expert contracts and specific contracts. Cash contribution will also be made as EU contribution to the Project Team.

WORK PROGRAMME OBJECTIVES

Milestone ID	Scope Description	Forecast achievement date	Type of milestone	PA
EU.BA.01.10510	Placement of the contract F4E-OFC-1650 for Maintenance and Optimization of the High Voltage Power System	Q3 2024	WP24 objective	LIPAc Enhancement - RF Power System
EU.BA.01.21310	End of installation of Power Supply system for feeding the Error Field Correction Coils on Site	Q4 2024	WP24 objective	Error Field Correction Coils
EU.BA.01.27600	Completion of the SRF Linac assembly in the Joint Research Building	Q3 2024	WP24 objective	LIPAc Activities
EU.BA.01.38800	Supply of equipment or services for tests with BA Projects and ITER	Q4 2024	WP24 objective	Collaborative activities with JT-60SA, ITER, and the IFMIF/EVEDA LIPAc accelerator
EU.BA.01.38860	Delivery of vacuum components of the transmission lines	Q3 2024	WP24 objective	ECRH Transmission
EU.BA.01.39680	Completion of the 1st stage of High-Heat-Flux	Q3 2024	WP24 objective	Divertor for Operation Phase 3

	elements for the JT-60SA Actively Cooled Divertor			
EXPECTED RESULTS				
<p>The main expected results for this action are:</p> <p>JT-60SA:</p> <ol style="list-style-type: none"> 1. Delivery of the full Thomson Scattering system 2. Factory test report for transmission line components 3. Installation of the error field correction coils completed and acceptance on site 4. Delivery of VUV to the Naka site <p>IFMIF/EVEDA</p> <ol style="list-style-type: none"> 1. Delivery of the report for the 5 MeV pulsed and CW beam commissioning phase 2. Completion of the cryomodule assembly 3. Technical Report on Modeling of erosion/corrosion process and the distribution of the Activated Corrosion Products and Be in ELTL (IFMIF-EVEDA Li Loop) 4. Technical report on defining the experimental programme to be executed in the 1:1 pilot plant <p>IFERC</p> <ol style="list-style-type: none"> 1. Testing functions of various ITER/CODAC applications (API) and examination of accessibility and operability to these APIs from Rokkasho and from Barcelona under the collaboration REC-IO (CODAC application testing) 2. Start of the neutron irradiation for in-situ tritium release experiments on the Neutron Irradiation experiments of Breeding Functional Materials for the DEMO R&D 3. Complete development of detailed physics models in selected functional blocks of the DEMO fuel cycle on the development of Tritium inventory evaluation tool for DEMO fuel cycle design. 4. Complete update design of Breeding Blanket (BB) segment for DEMO Design activities (Breeding Blanket design and tritium extraction and removal) 5. Supply of high-performance computer resources and analysis and support of simulation projects 				
TARGET				
The target for 2024 is "Annual M-SPI \geq 0.8".				

Action 15. DONES

Action 15	DONES
<p><u>Progress of Work</u></p> <p>The plan for 2024 is to validate the finale design of key components, integrating the design improvement as feedback of the ongoing LIPAc engineering validation phases, but also to increase the availability of LIPAc during the commissioning phases with the availability of spare parts. Additionally to consolidate the F4E contribution to the DONES Programme external support will be contracted to consolidate the current baseline and to provide support for the integrated activities during the ramp-up.</p> <p>It is worth to underline that those commissioning phases are identified in the DONES Programme milestones as interface points with the construction phase of the IFMIF-DONES facility (i.e. validation of the RFQ in high duty cycle and SRF Linac at low duty cycle).</p>	

Procurement Activities

Taking into account the possible F4E contribution to the DONES Programme, it is important to consider the continuation of early procurements of essential equipment for DONES for risk mitigation using LIPAc as support facility.

The activities are carried out through task orders of existing/new framework contracts or existing/new supply and service contracts. F4E will be continuously supported by experts funded respectively by F4E through expert contracts and specific contracts.

Cash contributions will also be provided to the DONES Consortium for the early deployment and training of human resources for the DONES construction phase.

It is also considered to launch the procurement by the end of this year of the EUROFER raw material, which will be used on the Target and Test system.

WORK PROGRAMME OBJECTIVES

Milestone ID	Scope Description	Forecast achievement date	Type of milestone	PA
EU.DO.00180	Placement of the contract for the procurement of EUROFER raw material for Lithium and Target system	Q4 2024	WP24 objective	
EU.DO.00270	Placement of the option for engineering support contract F4E-OMF-1159-01-01-100 for the BA/DONES Projects (2023-2025)	Q4 2024	WP24 objective	Programme Team and System Integrated Management
EU.DO.00690	Publish Invitation to Tender for Design and Procurement of the cavity	Q3 2024	WP24 objective	SRF Linac
EU.DO.01410	Completion of Stage 1 of Supply of the RF Couplers for the Radiofrequency Quadrupole for LIPAc	Q4 2024	WP24 objective	RFQ

EXPECTED RESULTS

The main expected results for this action are:

1. System Engineering and Project Integrated Management set up
2. Components tested on LIPAc
3. In Kind Contribution to the DONES Programme

TARGET

The target for 2024 is "Annual M-SPI \geq 0.8".

WP_TABLE 1 WORK PROGRAMME 2024 BUDGET SUMMARY

Budget Summary of the 2024 Work Programme

Budget article		Work Programme Commitment appropriations (EUR)
3 1	ITER construction including site preparation	435,130,456.33
3 2	Technology for ITER	12,093,743.00
3 3	Technology for Broader Approach & DEMO	30,838,505.00
3 4	Technology for DONES	4,021,000.00
3 5	External Support Activities	25,298,665.00
3 6	Other Operational expenditure	6,607,383.00
Total Title III of the Budget		513,989,752.33
4 1	ITER construction from ITER host state contribution	138,622,094.52
4 2	Activities linked to ITER Organization	59,454,036.49
4 3	Other earmarked expenditure	
Total Title IV of the Budget		198,076,131.01
Total amount available for the operational expenditure		712,065,883.34

Work Programme		Work Programme Commitment appropriations (EUR)		
		Grants	Procurement	Cash
3 1 + 4 1 + 4 2 Expenditure in support of ITER Construction + 4 3		1,618,769.24	414,447,999.10	217,139,819.00
Sub total ITER construction + RF			633,206,587.34	
3 2 Design and R&D in support of ITER, not credited			12,093,743.00	
Sub total technology for ITER			12,093,743.00	
3 3 Expenditure in support of Broader Approach			16,144,150.00	14,694,355.00
Sub total Technology for Broader Approach and DEMO			30,838,505.00	
3 4 Technology for DONES			2,421,000.00	1,600,000.00
Sub total Technology for DONES			4,021,000.00	
3 5 External Support Activities			25,298,665.00	
Sub total External Support Activities			25,298,665.00	
3 6 Other Expenditure			6,607,383.00	
Sub total Other Expenditure			6,607,383.00	
Totals Operational Expenditure		1,618,769.24	477,012,940.10	233,434,174.00
			712,065,883.34	

WP_Table 1 . Work Programme Budget Summary

WP_TABLE 2 - INDICATIVE VALUE OF FINANCIAL RESOURCES FOR THE ACTIONS IN WP2024

Action #	Action	WP2024			WP2024AM1			Δ WP (Am.1 - Original) (3)=(2)-(-1)	
		Budgeted forecast WP2024	Reserves	Total Resources allocated	Budgeted forecast WP2024 AM1 (2)	Reserves	Total Resources allocated		
1	Magnets	1,608,267	Appropriations that have been cancelled in accordance with Art.12.1. of the F4E Financial Regulation may be entered in the Budget 2024 Amendment 1, provided that the late commitment forecasts are verified and confirmed by the end of April 2024	1,608,267	479,529	24,454	503,983	-1,128,738	
2,3,4,10*	Main Vessel*	110,183,418		110,183,418	121,629,228	26,915,223	148,544,451	11,445,810	
5	Remote Handling	8,145,139		8,145,139	6,731,106	352,260	7,083,367	-1,414,033	
6	Cryoplant & Fuel Cycle	3,818,495		3,818,495	5,004,945	854,800	5,859,744	1,186,450	
7	Plasma Engineering & Operations					0	0	0	
8	Heating & current drive	25,452,484		25,452,484	26,227,805	9,872,600	36,100,405	775,321	
9	Diagnostics	6,487,229		6,487,229	5,797,421	1,539,871	7,337,292	-689,808	
11	Site and Buildings and Power Supplies	137,594,954		137,594,954	165,437,599	43,001,302	208,438,901	27,842,645	
12	Cash Contributions	211,979,980		211,979,980	215,162,180	5,000,000	220,162,180	3,182,200	
13	Technical Support Activities	30,391,391		30,391,391	37,236,697	1,898,928	39,135,626	6,845,307	
14	Broader Approach	50,651,225		50,651,225	31,686,705	1,840,400	33,527,105	-18,964,520	
15	Dones	2,020,000		2,020,000	4,255,800	1,117,029	5,372,829	2,235,800	
	Sub-Totals	588,332,581		0	588,332,581	619,649,015	92,416,868	712,065,883	31,316,434

Of which reserve stemming from cancelled appropriations to be entered in the estimate of revenue and expenditure of the following financial years as per Art.12.1 FR

25,782,018

Of which reserve stemming from appropriations corresponding to external assigned revenue from ITER Host State as per Art.12.2.4.b FR

13,583,000

Of which reserve stemming from appropriations corresponding to external assigned revenue from ITER IO as per Art.12.2.4.b FR

53,051,850

*The Sub-actions Actions of Vacuum Vessel, In-Vessel Blanket, In-Vessel Divertor and Test Blanket Module are presented merged in one single line due to commercial sensitive information.

WP_Table 2 . Financial Resources per action

WP_TABLE 3 - 2024 MAIN PROCUREMENT ACTIVITIES (PER ACTION)

Action		Type of contract	Signature
Magnets			
Provision for amendments, claims, reimbursement, indexation and late interest		N/A	N/A
Vacuum Vessel			
CA14550	Commitment and TO Signed Firm Part - F4E-OMF-1082-01-12 PAUT files (6 months)	SC-PServ	Q1
CA15016	Task Orders for Engineering & Metrology support activities 2024	SC-PServ	Q4
CA14125	Commitment and Task Order Signed - F4E-OMF-1544-WTO-A24 for 1 VV Resident Inspectors	SC-PServ	Q3
CA14128	Commitment and Task Order Signed - F4E-OMF-1544-WTO-B24 for 1 VV Resident Inspectors	SC-PServ	Q3
CA14131	Commitment and Task Order Signed - F4E-OMF-1544-MGR-A24 for 1 VV Resident Inspector & CP support	SC-PServ	Q2
CA14136	Commitment and Task Order Signed - F4E-OMF-1544-MGR-B24 for 1 VV Resident Inspector & CP support	SC-PServ	Q2
CA13117	Commitment & TO signed for F4E-OMF-1153-01-01-04 for Option 1 for Mechanical Analysis Support for VV	SC-PServ	Q4
Provision for amendments, claims, reimbursement, indexation and late interest		N/A	N/A
In Vessel- Blanket			
CA06534	TO 3 for FwC BCM (OMF-1080) - Chimney Pipes	SC-PSupply	Q4
CA13007	Task Order for Testing of Task 1 supports	SC-PSupply	Q2
CA14067	Option 2 - Additional coating of barrels (PCR-XXXX)	PSupply	Q2
CA14803	Residual obligations on Be Management	SC-PServ	Q4
CA13140	Disposal of Be mock-ups at FZJ	PServ	Q3
CA13069	Task Order Resources - Resident #1 25/26	SC-PServ	Q4
CA15244	Task Order for Inspector QA inspector #1 (2025-2026) [1st continuation TO 39 OMF-1159-LOT1-01] - Cantabria	SC-PServ	Q4
CA13079	Task Order Resources - Welding Engineer 25/26	SC-PServ	Q4
CA09865	Task Order Resources - PM Support (Junior) 25/26	SC-PServ	Q4

CA13073	Task Order Resources - Docs Management #1 25/26	SC-PServ	Q4
Provision for amendments, claims, reimbursement, indexation and late interest		N/A	N/A
In Vessel- Divertor			
CA08583	OMF-1139-02-01 Signed for IVT Pre-Series Production	SC-PSupply	Q3
CA11548	TO-38.01 OMF-1159-01-01 signed for Engineering Support - IVT (2 resources)	SC-PServ	Q4
CA13298	Task Order WY OMF-1321-01 Signed for Resident Inspector at Monoblocks Supplier #2 for IVT Series (China)	SC-PServ	Q4
CA13289	TO-03 OMF-319-01 signed for HHF Tests for Stage 2 Prototypes -IVT	SC-PServ	Q3
CA12494	Task Order WRT.01 OMF-1321-01 signed for Inspector for WTO - RT (30 months)	SC-PServ	Q4
CA13012	TO-XZ OMF-1327-01 Signed for Metrology Support	SC-PServ	Q4
Provision for amendments, claims, reimbursement, indexation and late interest		N/A	N/A
Remote Handling			
CA11814	TO 02 OMF-1115-01 for FP Diagn., BIPS(TB04), LD, I&C, Add. Heating and Real Time Software Support Activities	SC-PServ	Q2
CA14953	Task order (OMF-989-01-0X) for Genrobot, C&C, OMS development	SC-PSupply	Q3
CA11731	Task Order for Engineering Insourcing Contract (MS-1) CPRHS 2023	SC-PServ	Q4
CA15240	Task Order (OMF-1023-01-12 Esteyco) BLT captive comp + TLOM design	SC-PServ	Q1
CA15211	TO signed for OMF-1127-01-15 for RMV support for RH Team - Gabriel Pelaez 2024	SC-PServ	Q1
Provision for amendments, claims, reimbursement, indexation and late interest		N/A	N/A
Cryoplant and Fuel Cycle			
CA15533	TO Signed for OFC-1087 procurement of TMPs and other long lead items/components in 2024	SC-PSupply	Q4
CA15433	TO Signed for I&C software and integration with CODAC implementation 3 FTEs insourced up to 2028	PServ	Q2
CA15250	Task order signed for Execution of firm part for OMF-1159-01-01-116 Engineering Support - firm part 2024-2025	SC-PServ	Q2
CA11814	TO 02 OMF-1115-01 for FP Diagn., BIPS(TB04), LD, I&C, Add. Heating and Real Time Software Support Activities	SC-PServ	Q2
Provision for amendments, claims, reimbursement, indexation and late interest		N/A	N/A
Plasma Engineering & Operations			

Provision for amendments, claims, reimbursement, indexation and late interest		N/A	N/A
Heating and Current Drive			
CA11035	OPE-1203: Contract Signed for NB Tooling NBI 1&2 Phases II and III	PSupply	Q4
CA15241	OMF-1120 Task Order Signed for Additional RF testing campaign associated to the Upper Launcher	SC-PServ	Q2
CA01020	Task Order Signed for Technical Follow-up of Gyrotron Tubes & Super Conducting Magnets	SC-PServ	Q4
CA01421	Contract Signed for Manufacturing of Isolation Valve Prototypes and Design Finalization	PSupply	Q3
CA12859	OFC 582: Task Order 4 Signed for PRIMA#04 Assembly	SC-PSupply	Q4
CA13240	OMF-1159 Task Order Signed for Engineering Support for EC UL Project (2024-2025) - Part I	SC-PServ	Q3
CA11814	TO 02 OMF-1115-01 for FP Diagn., BIPS(TB04), LD, I&C, Add. Heating and Real Time Software Support Activities	SC-PServ	Q2
CA13229	OMF-0989: Task Order 13 Signed for FDR preparation for ECPC & EC-UL-SCU	SC-PServ	Q3
CA15329	OMF-0989: Task Order Signed for the FDR documentation of the EU Gyrotrons Control System	SC-PServ	Q3
Provision for amendments, claims, reimbursement, indexation and late interest		N/A	N/A
Diagnostics			
CA15371	Renewal firm part signed for in-source personnel under OMF-1159-01-01-25	SC-PServ	Q3
CA10652	Task Order Signed for Development of Bolometer data-analysis Software	SC-PServ	Q4
CA11814	TO 02 OMF-1115-01 for FP Diagn., BIPS(TB04), LD, I&C, Add. Heating and Real Time Software Support Activities	SC-PServ	Q2
CA14706	External Support for CXRS I&C and Software Design	SC-PServ	Q4
CA13658	Contract Signed for CON new AG brazing related activities PCR001411 to be transferred to IO	SC-PServ	Q2
Provision for amendments, claims, reimbursement, indexation and late interest		N/A	N/A
Test Blanket Module			
CA09804	TO 03 for Proof of the TBM-sets fabrication and assembly processes feasibility	SC-PServ	Q4
CA08690	Eurofer Procurement (TBM Box Qualification)	PSupply	Q4
CA13358	TO-5 signed for Preliminary Design refinement and preparation of PDR documentation	SC-PServ	Q4
CA12701	TO-5 for Preliminary Design of HCPB Ancillary Systems	SC-PServ	Q3

CA10946	TO#01 for EUROFER Codification Database	SC-PServ	Q4
CA13469	Task Order Signed for TO 04 for WCLL Ancillary Systems PDR docs	SC-PServ	Q4
CA12838	ESP - TO 16 for Senior System Engineering Management support (Tools development - WCLL) - MDY	SC-PServ	Q1
CA12841	ESP - TO 2 for System Engineering Management support (implementation - HCPB) - JNT	SC-PServ	Q2
CA15347	ESP - F4E-OMF-OMF-1159-01-XX for Engineering Support for WCLL Water Cooling & Coolant Purification Systems - TBO	PServ	Q4
CA12887	ESP - TO 2 signed - Technical Support for the WCLL TBM Set - Part 2 - RFT	SC-PServ	Q3
Provision for amendments, claims, reimbursement, indexation and late interest		N/A	N/A
Site and Buildings and Power Supplies			
CA14052	TB21 - TO 101 Lot 1 Load Center 08 Design & procurement, busbars and SDBs (TB04)	SC-PSupply	Q2
CA14270	AE II - Commitment for Contract Architect Engineer Services II - Core activities 2025-2030 (including indexation)	SC-PServ	Q4
CA14926	TB21 - TO 208B Lot 2 - Fire Isolation Dampers (TB04)	SC-PSupply	Q2
CA14348	AE II - Commitment for AE Servs. II - Core activities 2025-2030 – (TB04) TB04 VCC related topics (including indexation)	SC-PServ	Q4
CA12014	TB21 - TO 206 Lot 2 PIC Valves and pumps (TB04)	SC-PSupply	Q2
CA14924	TB21 - TO 110 Lot 1 - Cable & Cable trays in galleries (TB04)	SC-PSupply	Q1
CA15049	TO 03 OMF-1116-01 for Nuclear safety I&C Execution design of the tokamak Complex first phase TSS Jacobs (TB04)	PServ	Q4
CA14053	TB21 - TO 101 Lot 1 Load Center 08 Design & procurement, busbars and SDBs (TB04) (Increase of Raw Material)	SC-PSupply	Q2
CA14018	TB21 - TO 201 Lot 2 Mechanical and HVAC components (TB04)	SC-PSupply	Q2
CA14018-1	TB21 - TO 201 Lot 2 Mechanical and HVAC components (TB04)	SC-PSupply	Q2
Provision for amendments, claims, reimbursement, indexation and late interest		N/A	N/A
Supporting Activities			
CA08979	2024 Commitments and Budget Reserves for Legal Services charged against Operational Budget	SC-PServ	Q1
CA07547	Commitment 2024 for Convention 3 (affectation temporaire)	SC-PServ	Q4
CA15236	TO for IRIS 2024	SC-PServ	Q3
CA09710	Commitment 2024 for Operational Missions	PServ	Q1

CA06505	Commitment 2024 - Global transportation of HEL NON-EU ITER components	SC-PServ	Q4
CA10632	Third Party Liability insurance 2020-2025	PServ	Q2
CA11814	TO 02 OMF-1115-01 for FP Diagn., BIPS(TB04), LD, I&C, Add. Heating and Real Time Software Support Activities	SC-PServ	Q2
CA11299	Correction of premium on the basis of building values declared	PServ	Q4
CA13096	Commitments 2024 for Software Maintenance	SC-PServ	Q1
CA13538	TO 103 for KO DA 1 HEL VV sector #07	SC-PServ	Q4
Provision for amendments, claims, reimbursement, indexation and late interest		N/A	N/A
Broader Approach			
CA11921	Supply of JT-60SA actively cooled Divertor HHF elements Stage 2	PSupply	Q4
CA13584	TO01 F4E-OFC-1695 for the Maintenance and Optimization of RFPS of LIPAc	SC-PSupply	Q4
CA15340	TO01 F4E-OFC-1650 for the Maintenance and Optimization of RFPS of LIPAc	SC-PSupply	Q3
CA15341	TO01 F4E-OFC-1697 for the Maintenance and Optimization of RFPS of LIPAc	SC-PSupply	Q4
CA13172	TO06 for the rectification and improvement of the SCMPS	SC-PServ	Q2
CA13666	TO07 for Procurement and delivery to Naka of Hardware for the Power Supply Systems of JT-60SA – Year 2024	SC-PSupply	Q2
CA11912	TO02 OFC-1433 for Support services for Broader Approach - Part 2	SC-PServ	Q2
CA13664	TO for Quality Control and Supervision Support Inspectors for Divertor 2023	SC-PServ	Q4
CA15047	TO 06 for Procurement and delivery to Rokkasho of spare driver tetrodes	SC-PSupply	Q2
CA10435	TO05 for the maintenance of RFPS - new PSYS and off-site support LLRF, BPMs digitizers, white rabbit	SC-PSupply	Q1
Provision for amendments, claims, reimbursement, indexation and late interest		N/A	N/A
DONES			
CA14363	Supply of EUROFER raw material	PSupply	Q3
CA14362	Placement of the contract for Half-Way Resonator (HWR) - Lot 1	PSupply	Q4
Provision for amendments, claims, reimbursement, indexation and late interest		N/A	N/A

Table 3 . Main procurement activities per action

WP_TABLE 4 – PLAN FOR GRANTS

2024 GRANTS

Grant Agreements Reference	Expected date of Signature	Forecasted value to be committed	Duration (in months)	Counterpart (Leader Company)	Short Description
GRT-2024	Q4 2024	€950,000.00	48	TEKNOLOGIAN TUTKIMUSKESKUS VTT OY*T	Action 5 Remote Handling: Grant for Integration of Control System technologies at DTP2
F4E-FPA-327SG07	Q2 2024	€140,030.00	50	AGENZIA NAZIONALE PER LE NUOVE TECN	Action 9: Diagnostics: Amendment to Grant for change of deliverables end date due to late start of FDR activities
F4E-FPA-364SG06	Q2 2024	€28,739.24	62	MAX-PLANCK-GESELLSCHAFT ZUR FORDERU	Action 9 Diagnostics: Amendment for extension of F4E-FPA-364-06 for chits resolution
GRT-TBD	Q4 2024	€500,000.00	18-24	Unknown	Action 13 Technical Supporting Activities: Grant for Gradient joints on Tungsten CuCrZr materials
Total		€1,618,769.24			

ON-GOING GRANTS¹²

Grant Agreements Reference	Date of Signature	Committed Value	Duration (in months)	Counterpart (Leader Company)	Short Description
F4E-FPA-327 (PMS-DG)-07	20/02/2020	€2,081,637.00	50	AGENZIA NAZIONALE PER LE NUOVE TECN	FPA-327-07_Development of the Final Design and Prototyping
F4E-FPA-364-06	22/10/2018	€1,485,307.76	62	MAX-PLANCK-GESELLSCHAFT ZUR FORDERU	Development of the Design and Critical Prototyping
F4E-FPA-384 (DG)-05	30/07/2018	€2,602,067.56	65	MAX-PLANCK-GESELLSCHAFT ZUR FORDERU	F4E-FPA-384-SG05 Development of the Design and Prototyping
F4E-GRT-0901-01	09/03/2018	€1,731,559.13	64	TEKNOLOGIAN TUTKIMUSKESKUS VTT OY*T	Development and integration of 3D Machine Vision, HLCS modules and GENROBOT at DTP2
F4E-GRT-0974-01	20/12/2018	€368,536.00	54	TUOTEKEHITYS OY TAMLINK*	PROTOTYPING AND TESTING OF HYDRAULIC DIGITAL VALVES FOR THE DIVERTOR REMOTE HANDLING SYSTEM
F4E-GRT-1146-01	25/07/2021	€2,260,574.00	48	COMMISSARIAT A L ENERGIE ATOMIQUE E	Completion of the design of Equatorial Wide Angle Viewing System (EP-WAVS) in EP12 and post-design technical support
F4E-GRT-553	09/07/2014	€2,562,993.00	88	ECOLE POLYTECHNIQUE FEDERALE DE LAU	DESIGN, DEVELOPMENT AND VALIDATION OF THE EUROPEAN GYROTRON
Total		€13,092,674.45			

WP_Table 4. Plan for grants¹³

¹² Any 2023 Grant that was included in the original WP2023 but was not signed by the cut-off date of 31st March 2023 is not reflected in this table. Grants that were not known when the original WP2023 was drafted and that would be signed following a related WP2023 amendment are not listed neither.

¹³ The Commission guidelines require to produce two additional tables covering Service Level agreement and Contribution Agreements. These are not displayed since F4E has no Service Level agreement nor Contribution Agreements under operational expenditure.

WP_TABLE 5 TIME OF CALL FOR THE PROCUREMENT PLAN

Indicative number, type of contract and timeframe for launching the procurement procedures.

Procurement Procedures	Q3 2023	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024
P Serv - Contract	5	5	3	6	7	4
P Supply - Contract	6	8	1	10	8	2
Pserv - Specific Contracts	23	30	12	14	23	39
PSupply - Specific Contracts	8	6	3	10	7	5

WP_Table 5 . Indicative number and type of contracts per quarter

NB:

- During the implementation of the Work Programme activities, F4E may identify the need for new calls, group more activities in a single call or split one activity in more calls. This will in any case be performed preserving the scope and objective presented in WP2024.
- When a call for tender is not defined yet, the call is indicatively assigned to 6 months before the signature of the contract.
- For the specific contract, as they do not have call for tender, the table refers to its signature date.

ESSENTIAL SELECTION, AWARD CRITERIA AND UPPER FUNDING LIMITS FOR GRANTS

With regard to grant actions referred to in this Work Programme, the essential selection and award criteria are:

Essential Selection Criteria

- The applicants' technical and operational capacity: professional, scientific and/or technological competencies, qualifications and relevant experience required to complete the action.
- The applicants' financial capacity: stable and sufficient sources of funding in order to maintain the activity throughout the action.

Essential Award Criteria

- Relevance and quality of the proposal with regard to the objectives and priorities set out in this Work Programme and in the relevant call for proposals.
- Effectiveness of the implementation as well as of the management structure and procedures in relation to the proposed action.
- Cost-effectiveness and sound financial management, specifically with regard to F4E's needs and objectives and the expected results.

With regard to the specific action, more details will be provided in the call for proposals. Thresholds and weighting for the essential and additional award criteria will also be indicated in the call for proposals.

A proposal which does not fulfill the conditions set out in the Work Programme or in the call for proposals shall not be selected. Such a proposal may be excluded from the evaluation procedure at any time.

The timetable and indicative aggregated amounts for the actions are defined in this Work Programme.

Upper funding Criteria

With the entry into force of the recast F4E Financial Regulation and Implementing Rules on 1st January 2016, the following upper funding limits apply for grants:

1. Research, technological development and demonstration activities	40%
2. Purchase/manufacturing of durable equipment or assets and of ancillary services approved by the Joint Undertaking as necessary to carry out such activities	100%
3. Coordination and support actions, including studies	100%
4. Management activities, including certificates on the financial statements, and other activities not covered by paragraphs 1 and 2	100%

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