ITER Physics Work Packages

ANNUAL WORK PLAN 2015 & WORK PLAN 2016-2018

CALL RESPONSE FORM for the Work Package

WPDTT2: Definition and Design of the Divertor Tokamak Test Facility

# IDENTIFICATION

|  |  |
| --- | --- |
| **Work Package ID** | WP15-IPH-DTT2 |
| **BENEFICIARY** | Beneficiary Name |
| **CONTRACTUAL CONTACT PERSON** | Name / Email / Phone |
| **TECHNICAL CONTACT PERSON** | Name / Email / Phone |

# REFERENCED DOCUMENTS

The following documents provide descriptions for the technical content, key deliverables, milestones, foreseen facilities, opportunities for industrial innovation and training/development opportunities for each Work Package. It is essential that the relevant sections are considered before completing this Call for Participation:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ***Document Title*** | ***Version*** | ***Section(s)*** | ***Page(s)*** |
|  | GRANT AGREEMENT, ANNEX 1: WORK PLAN FOR THE IMPLEMENTATION OF THE FUSION ROADMAP IN 2014-2018 |  |  |  |
|  | ANNUAL WORK PLAN 2015 – Issue 3 | 25 Sep 2014 | 2.2.9 | 67-68 |
|  | WPDTT2 Project Management Plan (EFDA\_D\_2LJVP4 v3.2) | 3.2 | Annexes I, III, IV, V | 41-64, 70-76 |

# INTRODUCTION

This document is to be used in conjunction with the EUROfusion ECoM System in order for a Research Unit to respond to the EUROfusion Call for Participation in Work Plan 2014 – 2018 [1], particularly for the Annual Work Plan 2015 [2]. This call is a partial call for work additional to that which was covered in the call for the Annual Work Plan 2014 which included an expression of interest for activities in 2015-2018. **In filling out the sections below, the Research Units shall restrict themselves to the additional activities indicated.**

The purpose of this document is:

* To set out the required roles and associated competencies that are foreseen in order to execute the Project and to help the Project/Task Force Leader with planning.
* To allow Research Units to indicate where they have appropriate resources and competences.
* To allow Research Units to indicate a proposed resource level in professional-person-years per year (ppy/y) in 2015 and their interest and potential contributions to the Work Plan 2016-2018.
* To provide the required input for ECoM.

Finally, please note that no provision for allocation of mission resources is made in the present Call. These will be allocated as detailed in the Project Management Plan (PMP). The indicative budget is ≈6% of the foreseen manpower per project per. However, each Research Unit may fill the box at the end of this document to include its comments on the envisaged needs concerning missions for participation in this Work Package.

# GUIDANCE NOTES FOR SUBMISSION OF THE RESPONSE TO THE CALL

The following notes describe the procedure for completing this document and the related ECoM submission:

1. Fill in the appropriate information in the Identification table in section 1.
2. Read the relevant sections (see section 2) of the Work Plan 2014-2018 and Annual Work Plan 2015.
3. In section 5:
   1. indicate the appropriate human resources and competences available within your Research Unit to participate in the Work Plan 2015 (section 5.1)
   2. if foreseen give a list of activities to subcontract (section 5.2)
   3. supply names and contact details of potential contributors from your Research Unit and Third Parties (section 5.3)
   4. indicate proposed support for hardware but also procurements or use of facilities
4. The total proposed human resources (terracotta box from section 5.1) and hardware (blue box from section 5.4) for the 2015 work plan should also be entered into ECoM in the relevant boxes.
5. In section 6, indicate your interest and potential contributions to the Work Plan deliverables for 2016-2018, including the estimates for ppy
6. In section 7, quote up to 5 publications in the field relevant for the Work Package published by your Research Unit or Third Parties
7. In section 8, give any additional comments or describe requirements your Research Unit would like to express and that are necessary to contribute to this Work Package.

# DESCRIPTION OF INSTITUTION’S PARTICIPATION IN 2015 WORK PLAN

### 5.1 Personnel

Briefly describe the relevant competences of the proposed staff and their experience relevant for the **deliverables in 2015 Work Plan.** The particular staff members expected to participate in the work package may be indicated. Briefly describe any additional support the institution or the candidate's research group can provide or other related activities that may strengthen the proposal.

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| **Competency required for this Work Package** | | **Brief description of relevant competences and experience (max. 200 words)** | **ppy 2015[[1]](#footnote-1)**  (total available 4.5 ppy[[2]](#footnote-2)) |
| **Name** | **Description** |
| **Task 2: Assessment of advanced configurations** | | | |
| Control expert /  scenario expert | A2.3 Optimization, control and analysis of advanced magnetic configurations for implementation on European and international devices:   * Optimization and analysis of advanced configuration. * Closed-loop control of advanced configurations. * Experience useful for engineering alternative solutions for power exhaust in DEMO (e.g., strike point sweeping or wobbling) |  |  |
| Electrical engineer /  mechanic engineer /  nuclear engineer | A2.4 Analysis of alternative divertor configuration proposed by WPDTT1 in respect of their electromechanical feasibility (for a demo class device):   * PF coil system (calculation of forces, optimization) * maintenance and refurbishment * neutral shielding * conventional divertors * liquid metal targets |  |  |
| Physicist with competences on edge/bulk/scenario | A2.5 Exploration of DTT design for flexible implementation of DEMO compatible equilibria:   * Competences on edge/bulk/scenario |  |  |
| **Task 3: Assessment of liquid metals** | | | |
| Edge physicist | A3.1 Effects of Liquid Metal Targets on Scrape-Off Layer |  |  |
| Materials engineer /  mechanic engineer | A3.2 Design Integration of Liquid Metal Divertors |  |  |
| **Task 4: Definition of DTT technical requirements** | | | |
| Physicist | A4.1 DTT Physical Requirements and Specifications:   * Detailed definition of DTT role and objectives * Definition of operating and performance parameters of DTT * Definition of DTT flexibility requirements in terms of power exhaust solutions to be tested |  |  |
| Electrical engineer /  mechanical engineer /  materials engineer /  nuclear engineer | A4.2 DTT Technological Requirements and Specifications:   * Definition of the main subsystems needed and technical specifications in terms of operating and performance parameters |  |  |
| **Task 5: DTT conceptual design** | | | |
| Physicist | A5.1 DTT Physics Basis:   * start of a pre-conceptual "baseline" design (feasibility study) of DTT with reference to its physics basis including: * Physical objectives * Plasma performance and operational limits * Poloidal field configurations * Current drive and heating requirements * Power and particle exhaust conditions * Plasma instabilities and disruptions |  |  |
| Electrical engineer /  mechanical engineer /  materials engineer /  nuclear engineer | A5.2 DTT Technological Aspects:   * start of a pre-conceptual "baseline" design (feasibility study) of DTT with reference to its technological aspects including: * Technical objectives * Engineering performance * Operation requirements * Plasma facing components * Load assembly and maintenance * Power supplies * Magnets * Current drive and heating * Cooling * Diagnostics and control |  |  |
|  |  | **TOTAL**  *(to be entered also in ECoM –row A)* |  |

### 5.2 List of proposed activities to subcontract

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### 5.3 Indicative list of potential contributors

List potential contributors (members of your Research Unit or Third Party) to be involved in this Work Package. Give details of at least one person who can act as a contact person for the Project Leader.

|  |  |  |
| --- | --- | --- |
| **Name** | **Email** | **Phone Number** |
| **Contact Person:** |  |  |
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# EXPRESSION OF INTEREST IN FUTURE WORK PLAN 2016-2018

### 6.1 Personnel

In the areas of the new activities indicated above, please indicate your interest and potential contributions to the future Work Plan 2016-2018 deliverables, including the indicative ppy envisaged. Describe the additional support the institution or the candidate's research group can provide or other related activities that may strengthen the activity in the future.

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| **Competence** | **Indicative human resource budget profile (ppy)** **[[3]](#footnote-3)** | | | |
| **2016**  (4.5 ppy[[4]](#footnote-4)) | **2017**  (4.5 ppy4) | **2018**  (0 ppy4) | **2015-2018 TOTAL**  (13.5 ppy[[5]](#footnote-5)) |
| **Task 2:Assessment of advanced configurations** | | | | |
| A2.3 Optimization, control and analysis of advanced magnetic configurations for implementation on European and international devices |  |  | × |  |
| A2.4 Analysis of alternative divertor configuration proposed by WPDTT1 in respect of their electromechanical feasibility (for a demo class device) |  |  | × |  |
| A2.5 Exploration of DTT design for flexible implementation of DEMO compatible equilibria |  |  | × |  |
| **Task 3: Assessment of liquid metals** | | | | |
| A3.1 Effects of Liquid Metal Targets on Scrape-Off Layer |  |  | × |  |
| A3.2 Design Integration of Liquid Metal Divertors |  |  | × |  |
| **Task 4: Definition of DTT technical requirements** | | | | |
| A4.1 DTT Physical Requirements and Specifications |  | × | × |  |
| A4.2 DTT Technological Requirements and Specifications |  | × | × |  |
| **Task 5: DTT conceptual design** | | | | |
| A5.1 DTT Physics Basis |  |  | × |  |
| A5.2 DTT Technological Aspects |  |  | × |  |
| **Total** |  |  |  |  |

**Additional support and related activities (see above, max 200 words):**

# Summary of relevant publications

Please indicate the publications most relevant for this Work Package, up to a maximum of 5, published by your Research Unit in the last 5 years.

|  |  |  |
| --- | --- | --- |
| **Title** | **Author(s)** | **Year of Publication** |
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# ADDITIONAL COMMENTS AND REQUIREMENTS

Please add, if necessary, additional comments or describe requirements your Research Unit would like to express and that are necessary to contribute to this Work Package.

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| See the comments under section 6.1. Individuals are not named at this stage. |

1. To also include resources made available by Linked Third Parties or Third Parties providing in-kind contribution [↑](#footnote-ref-1)
2. Total available ppy is the foreseen total ppy for all Research Units answering this open call. These resources are added to those already allocated to the Research Units that are already contributing to these tasks/activities of WPDTT2 [↑](#footnote-ref-2)
3. To also include resources made available by Linked Third Parties or Third Parties providing in-kind contribution [↑](#footnote-ref-3)
4. Foreseen available ppy for all Research Units participating for the given year [↑](#footnote-ref-4)
5. Foreseen available ppy for all Research Units participating for the years 2015 to 2018

   [↑](#footnote-ref-5)