ITER Physics Work Packages

ANNUAL WORK PLAN 2015 & WORK PLAN 2016-2018

CALL RESPONSE FORM for the Work Package

WPMST2: Preparation of Exploitation of Medium-Size Tokamaks

RELATED ACTIVITIES

# IDENTIFICATION

|  |  |
| --- | --- |
| **Work Package ID** | WP15-IPH-MST2 |
| **BENEFICIARY** | *Please enter Beneficiary name* |
| **CONTRACTUAL CONTACT PERSON** | *Please enter Name / Email / Phone* |
| **TECHNICAL CONTACT PERSON** | *Please enter 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 |  | WPMST2 |  |
|  | ANNUAL WORK PLAN 2015 – Issue 3 | 25 Sep 2014 | WPMST2  2.2.6 | 52-55 |

# 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 MST2 Responsible Officer (RO) and selected sub-project leaders 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 following the definition of a detailed MST2 Project Management Plan (PMP). The indicative budget is ≈10% of the foreseen manpower per project per year. 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 above.
2. Read the relevant sections (see section 2) of the Work Plan 2014-2018 and Work Programme 2015.
3. In section 5:
   1. indicate the appropriate human resources, experience and competences available within your Research Unit to participate in particular MST2 project of Work Programme 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 and their competences 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 2014 work programme should also be entered into ECoM in the relevant boxes.
5. In section 6, in case of multi-year activity, indicate your contributions for 2016-2017, 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.
8. In section 9, describe your proposed project(s) following the format indicated

# DESCRIPTION OF INSTITUTION’S PARTICIPATION IN 2015 WORK PROGRAMME

### 5.1 Personnel

Briefly describe the relevant competences of the proposed staff and their experience relevant for the **project deliverables in 2015 Work Programme.** 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. Refer, when appropriate, to multi Research Unit activities but fill the data only for your Research Unit.

|  |  |  |  |
| --- | --- | --- | --- |
| **Projects required for this Work Package** | | **Brief description of relevant competences and experience to contribute to this project (max. 200 words)** | **ppy 2015[[1]](#footnote-1)**  (total available 20 ppy­[[2]](#footnote-2)) |
| **Project Name** | **Description** |
| WP15-MST2-A:  Improving spatial and spectral resolution of TCV TS system | Provide TCV TS system with enhanced spatial resolution (fibre splitting and additional polychromators) to view the upper LFS region or by populating the lower LFS region of the plasmas with spatial channels to benefit from the enhanced flux expansion. In addition, the gaps in the spatial coverage should be filled with extra channels to provide an uninterrupted coverage. The final upgrade system is expected to have a spatial resolution of 1% of the minor radius, i.e. 2.5 mm in the outer magnetic midplane. This project would initially make use of existing viewing access and laser systems and should be available in 2015. |  |  |
| WP15-MST2-B:  Developing the adaptor to facilitate interchangeable probes between MST devices | Design and manufacture of a set of adaptors to allow the exchange of reciprocating probe heads between AUG, MAST and TCV. In particular the exchange of the specialised heads such as the ball-pen probe (ÖAW/ENEA-RFX), residual field energy amplifiers (CCFE, IPP) or the high heat flux probe (IPP). The initial set of adaptors is expected to be ready in 2015. |  |  |
| WP15-MST2-C:  Imaging of runaway electron beam | A portable runaway imaging system between the existing MST devices (AUG, MAST and TCV) to study control and mitigation of the runaway beam by detecting the IR synchrotron radiation. Initially the project would assess the requirements, practicability and cost for such a diagnostic. Initial measurements with existing IR cameras could be performed in 2015 to optimise the diagnostic specifications, while the new diagnostic should be ready for 2016 MST campaign. The spatial and temporal resolution is expected be of the order of a few cm and ms respectively. |  |  |
| WP15-MST2-D:  Gold foil bolometers on MST for runaway and disruptions studies | An additional fast foil bolometer array on AUG in a different toroidal location to the existing arrays to allow a 2D tomographic reconstruction of the measured radiation with an accuracy of a few cm. The required time resolution is 0.5ms in order to resolve the pre thermal quench which is typically a 2-3 ms. This is a staged multi year project that needs to be phased with opening engineering breaks of ASDEX Upgrade. |  |  |
| WP15-MST2-E:  New infrared periscope system on AUG | ASDEX Upgrade is currently equipped with one periscope optics for IR measurements. The periscope itself has a movable optical head to be able to observe different parts of the divertor and main chamber (e.g Limiters, Heat Shield, Upper and Lower Divertor). In order to measure toroidal asymmetries a new second toroidal location IR periscope system is required, capable of using an existing IR detectors. |  |  |
|  |  | **TOTAL**  *(to be entered also in ECOM –row A)* |  |

### 5.2 List of proposed activities to subcontract

|  |  |
| --- | --- |
| **Project** | **Activity** |
|  |  |
|  |  |
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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.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Project** | **Name** | **Email** | **Phone Number** |
| WP15-MST2-X:  *(ID and name of first project)* | Contact Person: |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
| WP15-MST2-X:  *(ID and name of second project)* | Contact Person: |  |  |
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|  |  |  |
|  |  |  |
| WP15-MST2-X:  *(ID and name of second project)* | Contact Person: |  |  |
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### 5.4 Hardware description

If support for hardware but also procurements or use of facilities is requested, please give a brief description and the associated costs.

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicative list of hardware, procurements and use of facilities** | | **Brief description of the relevant expertise, facilities & approximate breakdown of costs** | **Costs 2015 (k€)**  (total available 1.0 M€ [[3]](#footnote-3)) |
| **Project** | **Description** |
| WP15-MST2-X:  *(ID and name of first project)* |  |  |  |
| WP15-MST2-X:  *(ID and name of first project)* |  |  |  |
| WP15-MST2-X:  *(ID and name of first project)* |  |  |  |
|  |  | **TOTAL**  (to be entered in ECOM) |  |

# EXPRESSION OF INTEREST IN FUTURE WORK PLAN 2016-2017

### 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.

|  |
| --- |
| **Project** |
| 2016 | 2017 | 2018 | **2015-2018 TOTAL[[4]](#footnote-4)** |
| WP15-MST2-X:  *(ID and name of first project)* |  |  |  |  |
| WP15-MST2-X:  *(ID and name of first project)* |  |  |  |  |
| WP15-MST2-X:  *(ID and name of first project)* |  |  |  |  |
| **Total** |  |  |  |  |

### 6.2 Hardware description

Please indicate the expected hardware support requests and associated costs to achieve Work Package deliverables in the Work Plan 2014-2018.

|  |  |
| --- | --- |
| **Project** | **Indicative list of hardware, procurements and use of facilities** |
| **2016** | **2017** | **2018** | **2015-2018 TOTAL[[5]](#footnote-5)** |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

**Brief outline of available facilities and justification of spending profile (max. 200 words):**

# Summary of relevant publications

Please indicate the publications most relevant for the WP15 projects this Work Package, up to a maximum of 5, published by your Research Unit in the last 5 years.

|  |  |  |  |
| --- | --- | --- | --- |
| **Project** | **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.

|  |
| --- |
|  |

# DESCRIPTION OF THE PROPOSED PROJECTS.

Please find below a template structure in order to describe further you project proposal(s). **Each project proposal** shall be a maximum of two pages in length. For proposals for projects involving two or more Research Units, each Research Unit should answer to this call using the same name and description clearly stating responsibility of each Research Unit.

### 9.1 Description of the proposal for project WP-MST2-X

#### a. Title

Give a one line title

#### b. Research Units involved

List all of the Research Units participating

#### c. Work description and deliverables (per year if multiyear project is foreseen)

For each year if multiyear projects are foreseen give:

- A work description (give details of activities involved, hardware, breakdown of work between Research Units. Note two page limit)

- Deliverables (in line with the Work Programme 2015)

#### d. Foreseen Travel involved

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 participating in this Work Package, including ongoing projects [↑](#footnote-ref-2)
3. Total available resources are the foreseen total costs for all Research Units participating in this Work Package, including ongoing projects [↑](#footnote-ref-3)
4. Total proposed resources comprising the years 2015 to 2017 [↑](#footnote-ref-4)
5. Total proposed resources comprising the years 2015 to 2017 [↑](#footnote-ref-5)