

EUROfusion Consortium

WORK PLAN 2014-2018 – ANNUAL WORK PLAN 2015

Call for Participation in

Power Plant Physics & Technology Work Packages

Background

The need of a facility able to produce fusion-like neutrons has been widely identified by the fusion materials community more than 30 years ago and confirmed again by the Materials Assessment Group and in the EU Fusion Roadmap. Whilst a full performance IFMIF provides the ideal Fusion Neutron Source device for testing materials up to dpa level for a fusion power plant, the needs for DEMO are such that the tests must start as soon as possible and to a reduced dpa level in order to be able to properly finalize the DEMO engineering design. According to the Materials Assessment Group¹ a minimum irradiation volume of around 300 cm³/material grade, at a minimum dose rate around 10 dpa/fpy, will be needed in order to generate the engineering database required (lower volume -in the range from 20 to 70 cm³/material grade-will also be useful if a higher risk is assumed for the DEMO design). An early start of an IFMIF-like reduced specifications 14 MeV neutron source is advocated in Horizon 2020 with the objective of have the facility ready by 2022.

The project must also take into account the results of the activities carried out by the IFMIF/EVEDA project, expected to be finished by mid-2017, in the framework of the Broader Approach Agreement between EU and JA and under coordination of F4E. These activities are focused on the preparation of the Engineering Design of the IFMIF facility and on the validation of this engineering design by the construction and operation of a number of different critical prototypes. Consequently, the development of the Early Neutron Source (ENS) project must take full advantage, on the one hand of the technical results obtained by the IFMIF/EVEDA project and, on the other hand, must be developed in close coordination with F4E in order to assure a coordinated approach to the construction of the Fusion Neutron Source required for DEMO.

The need of the Fusion Neutron Source is also recognized by other countries like Japan, South Korea, etc. So, the project should also take into account the possibility of an international approach to the ENS, either with a proposal to host it in Europe or in another country (for example in the framework of a new Broader Approach Agreement). Following the recommendations of the Fusion Roadmap, a number of different alternatives have been

¹ D. Stork, P. Agostini, J-L. Boutard, D. Buckthorpe, E. Diegele, S.L. Dudarev, C. English, S. Gonzalez, A. Ibarra, C. Linsmeier, G. Marbach, B. Raj, M. Rieth, M-Q. Tran and S. J. Zinkle *Assessment of the EU R&D Programme on DEMO Structural, Plasma Facing and High Heat flux Materials*, CCEFu57-7.1, European Commission (Dec 2012)

proposed for the implementation of a DEMO-relevant Fusion Neutron Source with budgets ranging from 150 to 400 MEUR. A technical assessment is being carried out during 2014 by the F4E Technical Advisory Panel involving additional technical experts, with the objective to identify the most efficient approach and a final report is expected by the end of 2014. Taking these considerations into account, the activities to be carried out in the ENS project in the timeframe 2015-2018 can be grouped in the following three categories:

- Site preparation activities, focused on the support of the activities required to demonstrate the capabilities of the various EU or non-EU sites to host the facility.
- Detailed engineering design with a focus on design integration evolved to a level that allows tendering the systems on the critical path would be available early 2018 for the start of the ENS construction.

Development of the conceptual engineering design of all systems which are not on the critical path but have interfaces to the systems described in the preceding point. In particular the key interfaces to the systems which are on the critical path must be addressed. Support R&D, focused on the development of those R&D activities required to finalize the engineering design of the facility.

The call for participation

This call for participation is for the Work Package:

WPENS	Early Neutron Source Definition and Design	2015-2018
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Response to the call

The responses to the call shall be submitted through the ECoM system (<https://ecom.euro-fusion.org/efda/cons>) no later than **midnight of 8th APRIL 2015**. The responses shall consist of:

- **One Call Response Form per Research Unit, uploaded onto ECoM.** A template *Call Response Form* for WPENS is supplied. This form describes the competencies and hardware that are required in order to execute the identified work. The Research Units should fill this form with their proposed participation. Note that this *Call Response Form* includes a guidance note for the completion of this document.
- The contractual and technical **contact person information for this Work Package**
- **The proposed manpower in 2015 for this Work Package:** this ppy value should be copied from the value in table 2 of the *Call Response Form* into ECoM.

- **The manpower costs:** the Research Units are asked to provide the average salary costs of their staff proposed in this Work Package. This average will have to include the eligible direct costs only (no indirect costs).
- **The proposed hardware cost** (including the cost for operation of facilities): The Research Units are asked to indicate the global costs for procurements (hard/software, external services), costs for the use of facilities and consumables directly linked to the implementation of the Work Package.

Note that for Annual Work Plan 2015 firm figures for manpower shall be provided (no hardware is foreseen in 2015). For the period 2016-18, the Research Units should express indicative figures based on the foreseen profile of manpower (labs and Industry) and hardware expenditure included in the attached *Call Response Form*.

For specific competencies (indicated in the *Call Response Form*) the names of proposed individuals should be provided, and their respective CVs uploaded to ECoM.

Please note that there is a consensus with the General Assembly on the importance of avoiding fragmentation. With this in mind, the proposed human resources must be focussed on a limited number of Work Packages, and where resources appear to be scattered, effort will be made in the evaluation process to consolidate them.

Evaluation process: Responses will be evaluated by the Project Leader, with the support of the Programme Management Unit.

The Project Leader shall prepare a proposal for the allocation of resources within the Work Package WPENS which will be reviewed and approved by the respective Project Board (to be established). The Programme Manager shall then include this allocation in the Budget to be presented to the General Assembly.

Applicable selection and evaluation criteria:

The following selection criteria will be applied:

- Completeness of requested information
- Matching of responses to the competencies defined
- Sufficient level of commitment to avoid sub critical contribution

The evaluation criteria will be as follows:

- Quality and appropriateness of the offered resources
- Proposed contributions to the implementation of the Work Package
- Best allocation of available resources

References

Please see *Call Response Form*.

Contacts

Any technical questions you might have please address to the WPENS Project Leader Angel Ibarra angel.ibarra@ciemat.es

For any other questions please contact the PMU RO Botond Meszaros botond.meszaros@euro-fusion.org

Information Meeting

As the WPENS is a new launch of a project, an information meeting will be held where the Project Leader will outline further the plans he developed to implement the work. All interested RUs are welcome to join this technical meeting which will be held remotely on **Thursday, 19th March 2015, 08.30h CET**.

FusionTV and Video Conferencing details:

FusionTV Channel 2 / 19Mar2015: ENS information meeting:

Presentation: <https://tv.euro-fusion.org/channel2/home>

Presentation Password: show

Video-conference nr. (H.323): 004910097920062

ISDN: +49-30-2541080 (ConferenceID = 97920062)