TECHNICAL NOTE

RELATED TO THE TDP[1] MARKET SURVEY ON

R&D on a Personal Monitor for Tritiated Vapor in Air

[1] TDP: Technology Development Program

IMPORTANT: This note is for information only. Data can be subject to change. Only the tender documentation will prevail for the related forthcoming Call For Tender.

1 INTRODUCTION TO TRITIUM REAL TIME WEARABLE MONITORING SYSTEM

Tritium is fuel for the fusion reactors and the worldwide blooming of fusion reactor concepts based on various technologies is increasing the request for tritium handling and monitoring capabilities.

To date, tritium air concentration is monitored in real time by ionization chambers positioned in the working area and the doses to which workers are exposed are evaluated ex-post through urine or breath analysis.

In the nineties, Polytechnic of Milan and JRC Ispra developed an interesting design of a personal monitor for tritiated vapor in air, based on scintillation. A prototype was developed and tested with encouraging results[2].

This real time monitoring approach would allow early detection in case of tritium release incidents with potential advantages for worker protection.

Nevertheless, please note that the above design and technologies are only presented for information purposes and any other relevant technical solution will be considered

[2] S. Arosio et alii: "A personal discriminating monitor for tritiated water vapor". Nuclear Instruments and Methods in Physics Research A 450 (2000) 522-530

2 SCOPE OF WORK

Within this project, the design of a personal monitor for tritiated vapor in air will be developed and a prototype will be manufactured aiming at a technology readiness level sufficient for subsequent industrial production and marketing.

In the frame of an F4E R&D funding scheme, development work will be performed in following steps:

- Collection of available information.
- Definition of the detailed project workplan schedule.
- Update of design focusing on measurement accuracy and operational reliability of the monitor.
- Realization of the prototype and testing at the ITER Static Magnetic Field Testing facility[3].
- Definition of production strategy.

2.1 EXPECTED OUTCOMES AND DELIVERABLES:

- Review report on available information.
- Design of prototype with manufacturing and test plan.
- Manufacturing of prototype.
- Report on outcomes from performance and testing activities.
- Report on production strategy

2.2 WORK PLAN AND TIMELINE:

- The project's detailed work plan will be outlined following an initial concept status assessment. For the moment, following time duration is envisaged for the steps listed in section 2.1:
  - **6 months**
    - Collection of available information.
    - Define the detailed project workplan schedule.
  - **20 months**
    - Develop the design focusing on measurement accuracy and reliability of the monitors.
    - Realization of the prototype and testing at the ITER Static Magnetic Field Testing facility.
  - **24 months**
    - Definition of production strategy.

[3] Testing at the SMF facility at ITER site (Cadarache, France) are free of charge for Manufacturers that will provide the instrumentation free-of-charge and will remain the owners of the unit. No liability on F4E or IO in case the instrumentation is damaged in the tests.

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3 EXPECTED SKILLS/EXPERIENCE

The successful tenderer is expected to have, either internally or by its sub-contractors, proven experience in manufacturing radiological monitors following codes and standards for nuclear applications.

4 MARKET SURVEY

To establish an optimum contract strategy, F4E needs to develop its understanding of the market with a comprehensive list of possible interested EU companies.

In the frame of the Market Survey, interested companies are invited to submit information. This information will be visible to F4E only and will not be communicated to other parties, except if agreed upon by the respondent(s).

Please answer the Market Survey by clicking on this LINK.