

# Job Title: Diagnostics Engineer IO1061

Requisition ID **6660** - Posted - (France, 13067 St Paul Lez Durance Cedex) - **Engineering of Systems - New Posting**

The ITER Organization brings together people from all over the world to be part of a thrilling human adventure in southern France—building the ITER Tokamak. We require the best people in every domain.

We offer challenging full-time assignments in a wide range of areas and encourage applications from candidates with all levels of experience, from recent graduates to experienced professionals. Applications from under-represented ITER Members and from female candidates are strongly encouraged as the ITER Organization supports diversity and gender equality in the workplace.

Our working environment is truly multi-cultural, with 29 different nationalities represented among staff. The ITER Organization Code of Conduct gives guidance in matters of professional ethics to all staff and serves as a reference for the public with regards to the standards of conduct that third parties are entitled to expect when dealing with the ITER Organization.

The south of France is blessed with a very privileged living environment and a mild and sunny climate. The ITER Project is based in Saint Paul-lez-Durance, located between the southern Alps and the Mediterranean Sea—an area offering every conceivable sporting, leisure, and cultural opportunity.

To see why ITER is a great place to work, please look at this video

**Application deadline:** 27/11/2022

**Domain:** Engineering Domain

**Department:** Engineering Design Department

**Division:** Port Plugs & Diagnostics Division

**Section:** Ex-Vessel Diagnostics Section

**Group:** Not applicable

**Job Family:** Engineering

**Job Role:** Engineer – 3

**Job Grade:** P3

**Language requirements:** Fluent in English (written & spoken)

**Contract duration:** Up to 5 years

*As a special notice for IO vacancies, the appointment to a position may be made at a lower grade if the qualifications and professional experience of the selected applicant correspond to that grade; in this case, the duties and responsibilities assigned will be adjusted accordingly.*

## **Purpose**

As a Diagnostics Engineer, you will design, oversee and implement fusion product diagnostics (such as neutron and gamma-ray cameras and spectrometers, neutron flux monitors, fission chambers, neutron activation systems and neutral particle analysers) for ITER in coordination with partnering institutions of the ITER Organization (IO). In this specific role, you will support the characterization, calibration and validation of the performance of the concerned diagnostics and their progression through the various developments stages and review gates until commissioning and operation. You will manage the scope, schedule, safety, quality control and cost of the diagnostic systems and their supporting hardware and software.

## **Background**

*Diagnostics provide measurements necessary to control the plasma and the tokamak operation to achieve ITER goals and gain the knowledge needed for future reactor design. The Port Plugs and Diagnostic Integration Division provides all the diagnostics of ITER, along with the engineering infrastructure, test systems and support through design, manufacturing, installation and commissioning, always keeping efficient operation in view. Fusion Product Diagnostic Engineers are responsible officers for the*

*diagnostic systems of the Fusion Product Diagnostic Cluster within the Ex-Vessel Diagnostics (EVD) Section. These diagnostics provide measurements critical to ITER operation, such as the fusion power, the neutron yield, the spatial and spectral distribution of neutrons, gammas and other fusion products as well as the activation level inside the Vacuum Vessel.*

### **Key Duties, Scope, and Level of Accountability**

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- Performs and coordinates R&D and engineering activities for the characterization and calibration of a broad portfolio of radiation detectors and fusion product diagnostic systems, such as neutron and gamma-ray cameras and spectrometers, neutron flux monitors, fission chambers, neutron activation systems and neutral particle analysers.
- Performs and analyses neutron and radiation transport calculations and synthetic measurement simulations to validate the performance of the fusion product diagnostics and meet the required accuracy of the fusion power measurements;
- Plans and organizes the delivery and storage of radioactive and ionizing sources;
- Manages the diagnostic interfaces with other ITER systems and components;
- Ensures that the diagnostics achieve specified requirements and propose and implement corrective actions as necessary;
- Drafts regulatory and safety documents (usually in French) as required;
- Conducts design reviews related to fusion product diagnostics, and other related systems as required;
- Specifies, edits and reviews R&D packages and oversees procurements and direct contracts, interacting with the Domestic Agencies (DAs) and IO Procurement and Contracts Division;
- Communicates with stakeholders within the ITER project and the international fusion community; in particular, by organizing and participating in workshops and other meetings;
- Proposes and implements plans for the construction, installation, commissioning and operation of the diagnostic systems for the whole project;
- Monitors and reports variances on all technical aspects and analyse potential impacts and propose recovery plans;
- Coordinates and reviews effective risk identification & management analyses and Reliability, Availability, Maintainability & Inspectability (RAMI) justifications;
- Performs change control process as necessary, propagating changes to all concerned stakeholders;
- May be requested to perform other duties in support of the ITER project;
- May be required to work outside ITER Organization reference working hours, including nights, week-ends and public holidays.

### **Measure of Effectiveness**

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- Ensures that work packages are completed to agreed quality, deadlines and costs;
- Develops accurate design and interface documentation, schematics, plans and databases within defined quality, scope, schedule and cost;
- Establishes high quality technical documentation for procurement including risks within defined schedule;
- Establishes operation and installation plans within the defined schedule and cost;
- Provides timely support to technical partners in DAs and other IO Departments / Offices;
- Successfully coordinates and synchronizes the integration of diagnostics in the diagnostic ports, but also in all other relevant parts of ITER such as galleries and diagnostic building within defined schedule;
- Maintains documentation for the systems accurate and up-to-date, under the defined scope of responsibilities.

### **Experience & Profile**

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- **Professional Experience:**
  - Minimum 8 years' experience of full project lifecycle management of instrumentation or diagnostics projects (including the development, integration, or operation of

diagnostics/instruments in other complex environments, such as nuclear installations, satellites, or large scientific projects) within complex international environments or projects.

- ***Education:***

- Master degree or equivalent in Engineering or Physics, or other relevant discipline;
- The required education degree may be substituted by extensive professional experience involving similar work responsibilities and/or additional training certificates in relevant domains.

- ***Language requirements:***

- Fluent in English (written and spoken);
- Working level in French language is desirable to communicate and address safety topics.

- ***Technical competencies and demonstrated experience in:***

- Interface management (identifying, resolving and maintaining technical and functional interfaces): Resolving complex and challenging technical issues;
- Project management (planning/measuring progress of project work, managing risks and costs): Identifying issues and delays in projects, development of recovery plans and cost, scope and schedule negotiations with international stakeholders;
- Specialized domain of work (Diagnostics):
  - Design, supervision of construction, integration, calibration, installation, commissioning and/or exploitation of Fusion Products systems as described above;
  - Experience on measurement of different plasma emissions, in particular of fusion products such as neutrons, gammas and fast particles, and their spatial, directional and spectral distributions is advantageous;
  - Knowledge on Research & Development of traditional and new nuclear detection systems which can be applied on ITER is advantageous;
- Analysis and interpretation of Fusion Products diagnostic data, including fusion power, total neutron yield, fuel ratio and ion temperature are advantageous;
- Systems Engineering and Design control such as functional analysis, requirement management, change control, and design reviews are advantageous;
- Knowledge of neutronics calculation codes such as MCNP is advantageous.

- ***Behavioral competencies:***

- Collaborate: Ability to facilitate dialogue with a wide variety of contributors and stakeholders;
- Communicate Effectively: Ability to adjust communication content and style to deliver messages to work effectively in a multi-cultural environment;
- Drive results: Ability to persist in the face of challenges, to prioritize tasks and to meet deadlines with high standards;
- Manage Complexity: Ability to analyze multiple and diverse sources of information to understand problems accurately before moving to proposals;
- Instill trust: Ability to apply high standards of team mindset, trust, excellence, loyalty and integrity.

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***The following important information shall apply to all jobs at ITER Organization:***

- Maintains a strong commitment to the implementation and perpetuation of the ITER Safety Program, ITER Values (Trust; Loyalty; Integrity; Excellence; Team mind set; Diversity and Inclusiveness) and Code of Conduct;
- ITER Core technical competencies of 1) Nuclear Safety, environment, radioprotection and pressured equipment 2) Occupational Health, safety & security 3) Quality assurance processes. Knowledge of these competencies may be acquired through on-board training at basic understanding level for all ITER staff members;
- Implements the technical control of the Protection Important Activities, as well as their propagation to the entire supply chain;

- May be requested to work on beryllium-containing components. In this case, you will be required to follow the established ITER Beryllium Management Program for working safely with beryllium. Training and support will be provided by the ITER Organization;
- May be requested to be part of any of the project/construction teams and to perform other duties in support of the project;
- Informs the IO Director-General, Domain Head, or Department/Office Head of any important and urgent issues that cannot be handled by line management and that may jeopardize the achievement of the Project's objectives.