

# Job Title: Magnet Control Software Engineer IO1097

Requisition ID **6908** - 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.

ITER Organization (IO) is an Equal Opportunity/Inclusive organization committed to diversity in the workplace, with diversity and Inclusiveness being one of the ITER Values.

As IO attracts and retains people coming from a vast array of different backgrounds and cultures, bias and exclusion cannot be tolerated. IO believes it is our diverse perspectives and backgrounds that gives unique strength and value to the ITER mission, regardless of race, member nation, gender, religion, status, sexual orientation, or disability - all are welcome and respected at ITER.

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:** 09/04/2023

**Domain:** Construction Domain

**Department:** Machine Construction Department

**Division:** Ex-Vessel Delivery & Assembly Division

**Section:** In-Cryostat, CTS & Auxiliaries Section

**Group:** In-Cryostat Instrumentation

**Job Family:** Construction

**Job Role:** Engineer – 3

**Job Grade:** P3

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

**Contract duration:** Up to 5 years

## **Purpose**

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As an engineer in charge of the Magnet Control System tests during assembly and final tests before entering the Commissioning phase, you will be responsible for all tasks to be performed on the Magnet Control system during the on-site component assembly to prepare for the Magnet System Commissioning. You will manage next steps for the development and qualification of the Instrumentation and Control testing procedures during and after assembly, the related Engineering Work Packages (EWPs), and the supervision of the on-site Instrumentation and Control (I&C) activities. Additionally, this role readies the

Magnet system functionally for Commissioning, as well as the specifications and follow-up of the control software development.

### **Background**

*The Magnet System is involved in the plasma confinement and control, and is made of 48 superconducting coils and modules. High Voltage and thermo-mechanical Low Voltage measurement chains are required for the magnet system protection and monitoring, and a thermo-mechanical monitoring of the Cryostat is also applied. All the related components have been specifically designed, developed and qualified for ITER.*

*Today, these components are almost fully procured and the on-site assembly activities have started.*

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

- Defines the technical specifications for:
  - the protection software development required for all Magnets system quench detection;
  - the control software development required for all Magnets system control functions in particular the cryogenic controls;
  - the magnet system Human Machine Interfaces (HMI) to be implemented for testing, commissioning and operating.
- Launches and monitors the procurement process and follows the contracts execution and delivery in collaboration with the Procurement and Contracts Division;
- Develops the interface configuration data sets for preparing the integration of the Magnet control system to the Central Instrumentation & Control (I&C) infrastructure;
- Manages the interfaces and partners with the Control Division, as well as the Cryogenic, Power Supply, Magnet, and Construction teams to confirm tasks are aligned with expectations and schedules;
- Issues and qualifies the tests procedures to be performed on the Magnet I&C system to check the proper actuator signal, and HV & LV sensor signal, continuity over the full signal chain up to the data display;
- Monitors the interfaces and Quality Assurance procedures of the instrumentation in close relation with the Quality Management Division;
- Analysis test(s) results, and issues the Engineering Work Packages (EWP) required for implementation by the proper contractors;
- Follows the Installation Work Package(s) (IWP) preparation and supervises the execution work of the related Construction Work Packages (CWPs);
- Develops and manages the test progress records during execution of assembly CWPs, and contributes to the Instrumentation CWPs supervision;
- Coordinates any additional training linked to the scope of the position for team members and stakeholders;
- May be required to work outside ITER Organization reference working hours, including nights, week-ends and public holidays.

### **Measure of Effectiveness**

- Develops the Magnet I&C system test procedures within defined quality and schedule requirements;
- Delivers the Control Software and HMI technical specifications to ensure contract is secured within defined schedule;
- Ensures that the CWPs documentation is prepared on time by the contractor and executed within the defined timeline;
- Organizes, presents, and records contractor training as necessary to ensure stakeholders are equipped for successful execution of deliverables;
- Issues the Central I&C interfaces to relevant stakeholders to guarantee integration of the Magnet control system to the Central I&C infrastructure.

### **Experience & Profile**

- **Professional Experience:**
  - Minimum 8 years' experience in instrumentation and control engineering in the field of assembly and commissioning of I&C system within complex international environments or projects.
- **Education:**
  - Masters' degree or equivalent in electrical engineering field 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).
- **Technical competencies and demonstrated experience in:**
  - Specialized Domains of Work - Instrumentation & Control : supervision and / or quality control of complex I&C system installation, including testing and commissioning;
  - Control Software Development: understands and executes analysis, coordinates and presents technical findings, management, and qualification results across stakeholders;
  - Software development for I&C systems using cRIO, FPGA and Siemens PLC or equivalent;
  - Quality Management: knowledge of I&C product and/or management requirements for international quality standards, methods, and practices;
  - Software contract, and procurement, management and execution: define needs and requirements, perform sourcing activities, and manage delivery including managing external parties to ensure implementation according to contractual agreements;
  - Interface management: identify, maintain, and / or resolve technical and functional interfaces to reach Project goals;
  - Writing and presentation: write and review contractual and technical documents in the domain of expertise, document and transmit knowledge with data, clarity, and precision;
  - Knowledge of / or experience in quench detection and protection in superconducting magnets systems is considered advantageous;
  - Knowledge of / or experience in cryogenic and vacuum processes is considered 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 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 (Knowledge of these competencies may be acquired through on-board training at basic understanding level for all ITER staff members) :
  - 1) Nuclear Safety, Environment, Radioprotection and Pressured Equipment
  - 2) Occupational Health, Safety & Security
  - 3) Quality Assurance Processes
- 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.
- For staff expected to perform on-call, shift hours, or other work outside ITER Organization reference working hours, including nights, weekends, and public holidays, the possession of a driving license valid in France is required. No commuting vehicle will be provided by the ITER Organization.