# Job Title: Instrumentation & Control Engineer IO0578 & IO1020

Requisition ID **3420** - Posted **08/01/2021** - (France, 13067 St Paul Lez Durance Cedex) - **Construction and Installation** - **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:** 21/02/2021
**Domain:** Construction
**Department:** Plant Construction
**Division:** Electrical Implementation
**Section**: Coil Power Supply or I&C Infrastructure Section
**Job Family:** Project Engineering
**Job Role:** Engineer - 1
**Job Grade:** P2
**Language requirements:** Fluent in English (written & spoken)
**Contract duration:** Up to 5 years

## Purpose

***Two Openings***: – Please note that your application will be considered for both positions.

**One Engineer job** will focus on the Implementation of the Control (I&C) system infrastructure with the I&C of different ITER Plant Systems, within the I&C Infrastructure Section.
**The second Engineer job** will focus on the integration of the Coil Power Supply (CPS) I&C, within the CPS Section.

**For both positions**, you will ensure that the I&C infrastructures are properly sized and implemented. You will integrate the engineering design of the relevant I&C and follow up the detailed design, procurement, manufacturing, factory testing, installation and on-site testing of the I&C systems.

## Background

The ITER facility is the first nuclear fusion plant, where most of the systems and associated control systems are under development. The facility is expected to have ~ 100.000 signals for the operation of the machine (like diagnostics of the plasma, superconducting magnets, cryogenics systems, etc) and ~20.000 signals for the nuclear safety of the plant (like isolation valves or radiological monitoring).

The I&C of ITER Coil Power Supply System (CPSS) is composed of three independent sub-systems respectively dedicated to 1) the Coil Power Converters, 2) the Reactive Power Compensator and 3) the Protective Switches and Main Busbar. In total there are more than 450 local control cubicles, which are to be interconnected and integrated.
Each CPSS I&C sub-system contains local, master and plant controllers to perform operation and protective functions. The investment protection and occupational safety functions are designed to protect the Tokamak superconductive magnets, as well as the personnel.

## Major Duties/Roles & Responsibilities

- Assesses the overall integration of I&C functions related to the ITER cabling and maintains interfaces as required;
- Validates the proper propagation of I&C functional requirements throughout the design (mainly the Electrical Cabling Diagrams);
- Verifies in the design stage that safety I&C functions' implementation strictly follows safety standards, especially on the instrumentation side;
- Integrates information related to the implementation of single I&C functions, including support functions identification and issues related to I&C loop diagrams;
- Ensures consistency between databases describing the I&C functions, such as power distribution data, cables lists, signal lists, cable termination data, equipment locations and classification;
- Monitors and follows up the engineering activities of the relevant Procurement Arrangements (PAs), to ensure that components and subsystems will be designed, fabricated, shipped, installed, tested and integrated on schedule consistent with the requirements;
- Develops the procedures for the on-site acceptance tests and integrated commissioning related to the I&C, in addition to testing/verifying deliverables from suppliers;
- Performs the integrated functional testing of the I&C systems, in addition to field surveillance of their installation, including trouble shooting as and when necessary;
- Implements and documents the programming or codes related to the Programmable Logic Control (PLC), Human Machine Interface (HMI), embedded system and Data Acquisition (DAQ) system as per I&C needs;
- Follows-up the design and production of Electrical Diagrams, Process Flow Diagrams (PFD), Cabling Diagrams, Wiring Diagrams, Control Loop Diagrams and as built I&C system description documents;
- May be requested to be part of any of the project/construction teams and to perform other duties in support of the project;
- May be required to work shifts outside normal working hours, including nights, weekends and public holidays.

## Measure of Effectiveness

- Ensures the proper implementation of safety and functional requirements by anticipating, and/or altering and fixing technical issues efficiently;
- Performs the design, construction, commissioning, operation and maintenance activities effectively and within the defined quality, cost and schedule;
- Anticipates or resolves interface issues between electrical components, plant systems and CODAC promptly to minimize disruption to the schedule;
- Performs efficient analysis and solves non-conformances, proposes effective mitigations respecting quality, costs and schedule;
- Maintains effective communication and excellent relations with interfacing teams within ITER and with external contractors.

## Experience & Profile

- ***Professional Experience:***

- At least 5 years' experience in the design, construction and/or operation of I&C systems for large electrical components and systems within an international environment.

- ***Education:***
  - Master or equivalent in I&C systems, Electrical engineering 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:***
  - Instrumentation & Control Systems & Engineering (Specialised domain of work):
    - I&C Engineering related to functional safety and nuclear safety;
    - Testing, commissioning and/or operation of I&C systems for large electrical systems;
    - Experience in developing embedded board cards and associated Application Programming Interfaces would be an advantage;
    - Experience in using Linux, virtualization environment and real-time operating systems would be an advantage;
    - Use and application of Distributed Control System (DCS) involving the design and implementation of hardware, software, data transmission networks and processes;
    - Use and application of hardware and codes of National Instruments (NI) DAQ systems;
    - Use and application of EPICS and/or industrial SCADA systems would be advantageous.
  - Design (Creating technical designs based on project requirements) :
    - Designing instrumentation loops diagrams and Single Line Diagrams;
    - Knowledge of IEC 61513 & 61226 would be advantageous, or other international codes and standards for I&C;
    - Familiarity with cable routing related deliverables.
  - Interface Management (Identifying, resolving and maintaining technical and function interfaces):
    - Resolving technical issues and proposing appropriate solutions.
- ***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 of 1) Nuclear Safety, environment, **r**adioprotection 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 lline management and that may jeopardize the achievement of the Project’s objectives.