Job Title: Scientist, Plasma Control IO1100

Requisition ID **6000** - Posted - (France, 13067 St Paul Lez Durance Cedex) - **Science and Technology Expertise** - **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: 08/05/2022
Domain: Science & Operation
Department: Science,Controls & Operation
Division: Science
Section: Experiments and Plasma Operation
Job Family: Scientific Coordination
Job Role: Scientist – 2
Job Grade: P3
Language requirements: Fluent in English (written & spoken)
Contract duration: Up to 5 years

Purpose

As a scientist in the plasma control area, you will work primarily on activities related to the design of the ITER Plasma Control System (PCS) and partially to support the deployment of the PCS during system commissioning, ITER integrated commissioning and plasma operation. A key component of your activities will be to coordinate and participate in the design of control functions for device protection. This will require coordination of the interfaces between the PCS and the ITER Central Interlock System (CIS) and Advanced Protection System (APS), which are responsible for machine protection. You will also be required to contribute to the development of the PCS exception handling function, the implementation of model-based control and other methods to avoid PCS approaching protection limits.

Background

The PCS is the primary tool for the control of the plasma generated in the ITER device. It is the first line-of-defence for investment protection and aims to avoid CIS action when protection limits are approached. Complex (advanced) protection functions are implemented in the APS, being a sub-system of the CIS. The PCS controls almost all necessary plant systems during a pulse, and especially those related to the plasma - from the plasma shape to the electron density and thermal stored energy. The quality of the control is one of the key elements for the success of the ITER mission.

Key Duties, Scope, and Level of Accountability

- Advances the technical interface between the PCS, APS/CIS and the implementation of protection functions, including those of an intermediate system in between the PCS and APS/CIS;
- Coordinates the design of advanced protection functions, especially for the first Pre-Fusion Power Operation Phase (PFPO-1);
- Develops protection functions which support the overall device protection, especially for PFPO-1, such as the triggering of the Disruption Mitigation System and First Wall Heat Load control;
- Contributes to the development of model-based control schemes and exception handling to optimize ITER investment protection, specifically for PFPO-1;
- Designs support functions in the Matlab/Simulink Plasma Control System Simulation Platform (PCSSP) environment;
- Carries out maintenance of the PCSSP and PCS infrastructure during ITER operation;
- Interfaces with other plant systems to ensure correct PCS or APS performance is obtained and correct system models are used to design these systems;
- Provides support for verification and validation tests from PCSSP to the implemented system;
- Contributes to the commissioning of the PCS prior to the start of ITER operation;
- Collaborates across IO and with external stakeholders and networks to exchange and/or confirm relevant information;
- 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 outside ITER Organization reference working hours, including nights, week-ends and public holidays.

Measure of Effectiveness

- Establishes high quality maintenance schemas, manuals and associated documentation for the PCS and APS;
- Provides competent evaluation of PCS components and appropriate quality on the delivered components;
- Proficiently utilizes relevant software to ensure a coherent and comprehensive control system design simulation;
- Ensures efficient coordination of activities between the design team and the ITER Controls Division, to ensure that objectives are achieved in line with cost and schedule;
- Communicates well and maintains high professional standards when interfacing with staff in the area of Plasma Control from the ITER Organization and ITER Members' R&D institutions and Domestic Agencies.

Experience & Profile

- ***Professional Experience:***
  - Minimum 6 years' experience in managing the design and implementation of control systems, in particular for plasma control in magnetic confinement devices within complex international environments or projects.
- ***Education:***
  - PhD Degree or equivalent in Electrical Engineering, Control Engineering, 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).
- ***Technical Competencies and demonstrated experience in:***
  - Design: Creating technical designs of control systems;
  - Using Matlab/Simulink, including competencies in other programming languages (C++ an advantage);
  - Using real-time applications and experience in plasma control considered advantageous;

- Interface Management: Identifying, resolving and maintaining technical and functional interfaces;
- Quality Control: Verifying the compliance of control systems with all applicable requirements;
- Systems engineering: Design planning, change control, requirements management and validation;
- Conducting acceptance and commissioning tests of control systems also an advantage.

- ***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;
  - Instil trust: ability to apply high standards of team mindset, trust, excellence, loyalty and integrity.

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.