

Job Title: Magnet Analyst IO1098

Requisition ID **5820** - 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: 17/04/2022

Domain: Construction

Department: Machine Construction

Division: Ex-Vessel Delivery & Assembly

Section: Magnet

Job Family: Engineering

Job Role: Engineer – 2

Job Grade: P2

Language requirements: Fluent in English (written & spoken)

Contract duration: Up to 5 years

Purpose

As a Magnet Analyst, you will carry out thermal and thermo-hydraulic analysis for the ITER magnets and their supporting systems, maintaining and updating the ITER superconducting codes and models, and providing results interpretation to support model verification through qualification tests. You will update performance assessment and the development of magnet commissioning and operations plans accordingly. You will provide expertise for the thermal hydraulic interpretation of the site acceptance tests and qualification tests of the superconducting magnets which are currently under assembly phase in ITER. In addition, you will complement thermal hydraulics analyses with safety analyses requested by the French Safety Regulator before the operation phase.

Background

The performance of the superconducting magnets have to be assessed in terms of thermal hydraulic analyses, under nominal operating plasma scenarios and cooling down and warm up phase. Thermal hydraulic and Process modelling shall be addressed to prepare for the magnet integrated commissioning operations. The models developed for design have to be updated with the as built data and the new inputs scenarios in terms of heat loads (AC losses, nuclear heating, conduction and radiation loads).

This position is assigned to the In-Vessel Coils & Performance Group.

Key Duties, Scope, and Level of Accountability

- Provides thermal and thermal-hydraulic engineering expertise to the magnet division;
- Identifies thermal and thermal-hydraulic interfaces and related interactions between systems, so as to propose a strategic plan to ensure the appropriate preparation for magnet commissioning and operations;
- Monitors and contains the main cryogenic heat loads on the magnets, their causes and methods;
- Updates the version of the thermal hydraulic codes and maintains up to date the existing cooling loop representation of the ITER magnet models;
- Drafts the strategy to operate the magnet system in compliance with the cryogenic plant requirements;
- Contributes to the operational performance predictions for the magnet component, in particular in the areas of quench protection and detection;
- Verifies the instrumentation used for both magnet and cryogenic systems using thermal analyses and proposes corrective actions as necessary to solve issues;
- 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.

Measures of Effectiveness

- Ensures the existing cooling loops of the ITER magnet are kept up to date.
- Defines an appropriate and feasible strategy to safely operate the magnet system in accordance with the cryogenic plant requirements.
- Contributes effectively to baseline documentation, design, installation, commissioning, operation, control and maintenance of all functions required for the correct and safe operation of the ITER magnet system.
- Contributes effectively to magnet / component tests and ensures that they are performed as per safety requirements.
- Verifies the proper instrumentation on both magnet and cryogenic systems and control it with relevant and accurate thermal analyses.

Experience & Profile

- **Professional Experience:**
 - Minimum 5 years' experience as engineer or analyst to develop and use thermal hydraulic and multi-physics system codes for dynamic simulation, in respect with safety requirements for cryogenic systems, within complex international environments or projects.
- **Education:**
 - Master degree in Thermal-hydraulic, Fluid process, Cryogenics, Nuclear Science or 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 Expertise (Thermal Hydraulic Analysis): Development and use of thermal hydraulic and multi-physics system codes for dynamic simulations. Strong experience in analysis of thermal hydraulic problems, including assessing performance against design & safety requirements;
 - Interface Management: identifying, resolving and maintaining technical and functional interfaces;

- Writing documentation related to presentation of technical analysis and tests results;
- Quality Control: preparing the compliance of the procedures for the commissioning and operation of magnet systems with all applicable requirements;
- CAD/CATIA/ENOVIA and/or engineering/manufacturing drawing production and review would be advantageous;
- Production and/or assembly of electro magnets would be an advantage;
- Performing structural, thermal and/or electromagnetic analysis of large welded or bolted components would be advantageous;
- Plasma molecular dynamic simulation in large tokamak devices and demonstrated experience in programming (FORTRAN, Python, etc.) and/or testing and controls would be 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;
 - Instill 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.