

# Job Title: Power Conversion Engineer IO1084

Requisition ID **5981** - 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:** 08/05/2022

**Domain:** Construction

**Department:** Plant Construction

**Division:** Electrical Implementation

**Section:** Coil Power Supply

**Job Family:** Construction

**Job Role:** Coordinating Engineer

**Job Grade:** P4

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

**Contract duration:** Up to 5 years

## **Purpose**

As a Power Conversion Engineer, you will supervise the activities related to the engineering design, integration, interfaces, procurement, installation and commissioning of the Power Converters for the ITER stage 2 Main Coil Power Supplies.

You will ensure the integration of the engineering design of the power converters for this stage with ITER's plant-level Instrumentation and Control (I&C) systems, in addition to ensuring the overall schedule for relevant activities

## **Background**

The stage 2 main Coil Power Supplies consists of 10 AC power feeding circuits, 12 AC/DC power converter units and 12 pairs of DC interconnection busbars with their I&C and other auxiliaries. These 12 new power supplies are upstream connected to 66 kV distribution busbars and are downstream connected with the DC interconnection busbars of stage 1 Main Coil Power supplies, to enhance the terminal voltages of main superconducting coils and to obtain more powerful capacity in plasma control. Three, 90 Mvar, 66 kV reactive power compensators and harmonic filters, based on STATCOM technology, are also planned to be procured, installed and commissioned.

This stage is rated up to continuous  $\pm 55$  kA at rated on-load voltage  $\pm 1050$  A. There are four unit to be procured at  $\pm 22.5$  kA, six at  $\pm 45$  kA, and two at  $\pm 55$  kA. The technology for these converters is likely to be

thyristor-based. These main coil power supplies will be designed, fabricated, and finally integrated physically and functionally with existing coil power supply and distribution system.

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

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- Manages and is accountable for the procurement, installation, testing and commissioning of the power converters, reactive power compensator and harmonic filters and associated auxiliary systems, to ensure that all components belonging to these systems will be designed, fabricated, tested and installed in accordance with the Project requirements, including specific safety requirements and interfaces with other ITER systems and the Project schedule;
- Develops the technical specifications for the detailed engineering and procurement of the components and follows up the work performed by the selected Contractors, ensuring the on schedule delivery and cost control;
- Performs the system integration of the components, including the layout and function integration;
- Develops the conceptual design of the components, the R&D plan and produce the technical specifications for procurement;
- Manages the interfaces and integration of the components with other systems, services and buildings;
- Supervises and performs the transient and steady state analysis of the electrical circuits of the system to verify the design solutions and the performances;
- Performs value engineering tasks to optimize cost and performances;
- Maintains the configuration and the engineering documentation for the super-conducting magnet power converters, including the simulation models, 2D drawings and 3D CAD models;
- Manages and ensures the compliance with Quality Assurance (QA) & Quality Control (QC) requirements and standards for components and systems, in close relation with the quality engineers;
- 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, weekends and public holidays.

### **Measure of Effectiveness**

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- Effectively manages and performs the design, procurement, construction and commissioning activities of the components for the defined scope;
- Provides the design solutions and solves issues for the design of the components through the engineering and R&D program;
- Maintains effective communication with the interfacing teams within ITER and with the external contractors
- Manage and performs engineering analysis as required to verify the performances of the components to a high standard and within the defined schedule;
- Effectively manages and follows up the installation and commissioning activities of the components;
- Effectively manages the activities related to resolution of interfaces and integration issues related to the components with other systems, services and buildings.

### **Experience & Profile**

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- **Professional Experience:**
  - Minimum 10 years' experience in supervising or managing the design, integration, interfaces, procurement, installation and commissioning of complex electrical power conversion and reactive power compensation systems within complex international environments or nuclear projects.
- **Education:**
  - Masters' degree or equivalent in electrical engineering field or other relevant discipline (power conversion is preferable);

- 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 and technical expertise: Power supplies and high power line commutated and voltage source power converters (managing design, construction, installation and testing of switching power supply and thyristor based power conversion systems);
  - Construction, project and contract management: large power supplies procurement and contracts for their entire lifecycle (e.g. preparation of technical specifications, managing gates completion and associated payments, mitigating risks, closing contract, etc.);
  - Quality Control: Verifying the compliance of the procedures for the installation of high power components and associated auxiliary systems with all applicable requirements;
  - Interface Management (identifying, resolving and maintaining technical and functional interfaces);
  - Good knowledge of International Electro-technical Commission standards for switching power conversion system and thyristor based power conversion system;
  - Analysis: Knowledge of steady-state and transient electrical analysis of line commuted and voltage source power converters;
  - Reviewing 3D modelling and 2D schematics would be advantageous.
- **Behavioral Competencies:**
  - Collaborate: Ability to conduct 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 gather and analyze multiple and diverse sources of information to define problems accurately before moving to proposals/solutions;
  - 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.

