

# Job Title: Vacuum Cryo-pumping Engineer IO0409

Requisition ID **6542** - Posted - (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:** 28/08/2022

**Domain:** Construction Domain

**Department:** Machine Construction Department

**Division:** Tokamak Complex Division

**Section:** Vacuum Delivery & Installation Section

**Group:** Vacuum Delivery

**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 a Vacuum Cryo-Pumping Engineer, you will be the lead engineer for the Front End Cryogenic Distribution (FECD) system which supplies cryogenics and warm helium to a large number of bespoke ITER cryo-pumps and other cryogenic clients. You will develop and maintain the interfaces between the ITER cryo pumps and their supplies, in addition to preparing for the installation, test, commissioning and operation of the FECD systems.

## **Background**

The ITER vacuum systems are of unprecedented size and complexity consisting of a large number of large volume vessel systems including the Cryostat (~ 8500 m<sup>3</sup>), the Torus (~1330 m<sup>3</sup>), the Neutral Beam injectors (~180 m<sup>3</sup> each) and a large number of lower volume systems. The vacuums of ITER are achieved and sustained with more than 400 custom and commercial pumps. The successful construction of ITER is dependent on excellent vacuum engineering. Many of the vacuum components are under construction or have been delivered and installation of the said components has commenced. This position will lead the design, procurement installation, commissioning and operation of the cryogenic distribution directly connected to the ITER cryo-pumping systems.

## Key Duties, Scope, and Level of Accountability

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- Follows the procurements of FECD which are the responsibility of the Vacuum Delivery and Installation Section through both direct contracts and In-Kind supply through a number of ITER Domestic Agencies;
- Maintains the designs and specification for the cryogenic supply through the lifecycle through to operations for 6 torus cryopumps, 2 cryostat cryopumps, 4 neutral beam cryopumps, 6 cryogenic roughing pumps including to their respective cold valve boxes (CVBs), warm regeneration system (WRB) and cryo-transfer lines;
- Develops and maintains Process and Instrumentation Diagrams (P&ID) for cryo-pumps and other clients connected to the distribution system;
- Ensures the overall system and physical integration for the FECD;
- Prepares the engineering documentation for the FECD installation and ensures specialist supervision for the installations;
- Ensures the implementation of Quality Assurance and Quality Control procedures for the FECD whole process from the supply completion, through design and up to the operation of this complex networked system;
- Maintains progress to the Project Schedule associated with the fabrication, installation, testing and commissioning of the FECD;
- 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.

Special notice: 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.

## Measure of Effectiveness

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- **Work Products:** Completes assignments as specified, on time and within budget; particular attention will be given to design progress, contract management, document preparation and project management; progress will be measured by quality and quantity of work products;
- **Team Contributions:** Provides and receives timely contributions from fellow team members, and contributes positively to an overall productive work environment;
- **Safety and Security:** Performs work, generates designs and oversees the work of others with proper attention to safety and security.
- **Interfaces successfully and communicates efficiently with other ITER Departments/Offices, Domestic Agencies, and maintains good relationships.**

## Experience & Profile

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- **Professional Experience:**
  - At least 8 years' experience in vacuum and cryogenic engineering related to a large complex plant, including custom component design and engineering.
- **Education:**
  - Master's degree or equivalent in a process or mechanical engineering field or other relevant discipline.
- **Language requirements:**
  - Fluent in English (written and spoken).
- **Technical competencies and demonstrated experience in:**
  - Specialized Domains of Expertise (Vacuum science and cryogenics); Producing designs and specifications for cryogenic distribution or cryo-pumps, including the development of P&IDs;
  - Commissioning of cryogenic system including working with helium at super critical temperatures and pressure;

- Thermal hydraulic calculations and gas dynamics;
  - Quality Control: Verifying the compliance of complex systems during supply completion, through design and up to operation;
  - Working to cryogenic/pressure/piping codes and good understanding of structural analysis;
  - Procurement and Contracts Management of manufacturing contracts for complex fabrications;
  - Experience of engineering in a high energy physics or other nuclear environment 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.
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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.