# Job Title: CODAC Applications Engineer IO0984

Req ID **1724** - Posted **07/05/2020** - (France, 13067 St Paul Lez Durance Cedex) - **Control and Data Acquisition** - **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:** 18/06/2020
**Domain:** Science & Operation
**Department:** Science,Controls & Operation
**Division:** Controls
**Section**: Data, Connectivity & Software
**Job Family:** Project Engineering
**Job Role:** Engineer - 2
**Job Grade:** P3
**Language requirements:** Fluent in English (written & spoken)
**Contract duration:** Up to 5 years

## Purpose

As a CODAC Applications Engineer, you will be responsible for completing the final design of the ITER Control, Data Access and Communication (CODAC) operational applications, which include the Plasma Control System (PCS), central supervision and automation/scheduling system.
You will implement control algorithms in the PCS for integrated commissioning and physics experiments.
You will also be involved in the preparation of the commissioning plan of the associated Operation Application System.

Background information:
The ITER Control, Data Access and Communication (CODAC) system interfaces to the ~170 Plant Systems that compose the ITER machine. CODAC provides the necessary applications and services to support commissioning activities and eventually conduct the integrated operation of the ITER machine with a high level of availability. The Plant Systems are delivered with their Instrumentation and Control (I&C) system by the ITER members. Integration started in 2018 and will continue up to first plasma in 2025 and beyond. CODAC Operational Applications consist of middle-layer software components which adapt the technical domain of the various Plant Systems to the Machine Operation domain, i.e. provide information gathering and synthesis, translate physics goals to machine parameters and control actions, etc.; and central Scheduling, Supervision and Automation, and Plasma Control systems to prepare and execute planned ahead commissioning and scientific operation campaigns.

## Major Duties/Responsibilities

- Completes the final design of the Control, Data Access and Communication (CODAC) Operational Applications, software frameworks and components in the areas of Real-time Framework (RTF) and PCS;

- Implements PCS to run on a real-time framework, from the architectural design to commissioning for plasma operation;
- Plans and executes the validation process of the CODAC Operational Application System from component level to integrated functions;
- Maintains and improves the CODAC Operational Applications software frameworks and components;
- Contributes to preparing the documentation related to the contracts to perform the aforementioned tasks;
- Provides expertise to the design and implementation of Supervision & Automation System (SUP) and Pulse Scheduling System;
- Contributes to the final design of PCS architecture and controllers which are the inputs for CODAC PCS final design;
- Prepares CODAC Operational Applications design reviews, as either a member of the design team or peer review team;
- Contributes to the preparation of the commissioning plan; validates and verifies the achievements of functionalities of the associated Operation Application System;
- Participates in Plant Acceptance Tests which have interfaces with Operation Applications, i.e. PCS;
- Participates in the plant system commissioning, integrated commissioning and operations;
- Gathers, analyses and documents stakeholder requirement specifications;
- Provides technical follow-up of software development projects contracted to external suppliers and assesses their compliance to requirement & quality standards;
- Resolves software issues with already-deployed operational software;
- Maintains and enhances functional, integration, system, stress, performance and regression test suites;
- Mentors and supports other members of the CODAC Operational Applications team in key areas of expertise;
- 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

- Delivers planned releases of CODAC Operational Application software components and quality audits as per requirements and on time;
- Provides robust procedures, standards, solutions and guidance during integration, commissioning, operation and maintenance activities in a timely manner and in line with quality standards;
- Ensures that operational software is available as much as possible;
- Keeps documentation up-to-date, which relates to software components.

## Qualifications and Experience

- *Professional Experience:*
  - At least 8 years' experience in an engineering role of designing, developing, testing and maintaining software components, ideally involved in a large scientific research facility.
- *Education:*
  - Master degree or equivalent in computer science, electronics, 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:*
  - Dealing with multiple control system stakeholders (physicists, technical domain experts, etc.);
  - Working with software-intensive distributed real-time data processing and control systems;
  - Working in a Linux environment and with real-time operating systems;
  - Working with:
    - version control tools (e.g., Subversion, Git);
    - unit testing frameworks (e.g. gtest, …);

        - debuggers and profilers (e.g., gdb, valgrind, …);
    - Advanced knowledge of C++, python;
    - Principles of writing clean, maintainable easily adaptable software to changing requirements;
    - Continuous integration tools (e.g., Jenkins, …) would be an advantage;
    - Quality standards for high integrity software (e.g. MISRA, HIC++, …) would be an advantage;
    - Static analysis tools (e.g., lint, SonarQube or commercial tools) would be an advantage.
- *Behavioral Competencies:*
    - Collaborate: Ability to 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 with high level of reliability and autonomy;
    - Manage Complexity: Ability to gather multiple and diverse sources of information to define problems accurately will the ability to set priorities and meet deadlines 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 lline management and that may jeopardize the achievement of the Project's objectives.