



**JOC-VN-172**

**Position Title: Plasma Operations and Control Expert**

**Background**

The Plasma Operations Group (POG) is responsible for plasma operational scenarios and the JET plasma control systems. The group includes

- Session Leaders with expert knowledge of tokamak operations and plasma scenario development who play a strong role in the JET experimental programme.
- Plasma Control Experts who develop the hardware and software for real time plasma boundary reconstruction from magnetic measurements, control of plasma current and shape, Vertical Stabilisation and ITER-like Wall real-time protection and provide expert control room manning for these systems for challenging experiments.

We are seeking a person to be seconded to POG, as part of to the JET Operating Contract Team, to play a key role in Session Leading, in the operation of the shape control, vertical stabilisation and ILW protection systems, and in the development of these in view of JET operation towards increasing input power and plasma performance. We aim to recruit a balance of skills including plasma physics, plasma control, control hardware and software. We seek somebody with a strong base in one of these four areas with some experience or knowledge in several of them, but with a keen motivation to develop in all of them.

**Main Responsibilities: will include some or all of the following:**

1. Act as Session Leader for Plasma Commissioning and S/T Plasma Operations.
2. Provide Plasma Operations expertise to the EFDA-JET Task Forces, including the development of new plasma scenarios and advice on the effective use of the real-time plasma control systems.
3. Take advantage of the experience as Session Leader in order to play an active role in the scientific exploitation of the JET Tokamak and the dissemination of JET results via scientific publications.
4. Commission and operate the existing plasma control equipment and fulfil the role of expert for preparation and execution of advanced plasma operation.
5. Participate in the development and improvement of the POG Real-Time Control products.
6. Support and promote the use of plasma design tools by Session Leaders, generate scenarios where the capabilities of the Extreme shape Controller can be fully exploited for improved plasma operation.
7. Improve the accessibility to the knowledge basis for all systems including documentation and publication of methods and results.

## **Requirements**

The applicant should have deep knowledge of at least one of the areas listed below with some working experience of one other and preferably some knowledge of the remaining.

### **Plasma Physics**

- BSc in physics (PhD preferred) with strong knowledge of electromagnetism and plasmas.
- At least 3 years post graduate experience at the research level.
- Recent attendance to JET Session leader Training course or JET Session Leader Licence (at any level).
- Experience of scientific or data analysis using IDL, python and/or Matlab or similar.
- Experience of constructing measurement and control systems an advantage.
- Experience of operation of a fusion device or of complex hardware (e.g. plasma diagnostics) on such a device an advantage.

### **Control Engineering**

- BSc (or higher preferred) in Electrical, Control or Software Engineering.
- Post graduate experience preferably in an R&D or research environment.
- Strong training or deep experience in control preferably including analysis design and simulation possibly using Matlab/Simulink or equivalent.
- Good understanding of electromagnetism and electric circuits.
- Experience on a magnetic fusion device a strong advantage.

### **Control hardware and software**

- BSc in any relevant discipline
- Several years experience in an R&D or research environment utilising the technology relevant for this post. Experience in the following areas would be particularly valuable:
  - Real time system design and build preferably VME and/or ATCA based modules, embedded processors and real time communications e.g. Ethernet, ATM.
  - Real time operating systems and application frameworks.
  - Design, implementation and verification of complex software applications preferably with C++.
  - Configuration management verification and validation.
  - Experience of Matlab/Simulink
- Basic understanding of electronics and electric circuits required. Some knowledge of electromagnetism is an advantage.

## **Aptitudes and Experience**

- A positive attitude towards new and challenging technical problems, initiative and an ability to critically review and evaluate a wide range of solutions.
- Ability to work in a team. Proficiency in English in a technical environment.

## **Special Features**

Although the primary role may be linked to specific Real-Time system, POG functions as a team and the secondee may be asked to assist with operation and/or maintenance of other systems for which the group is responsible.

JET experiments run from 06:30 until 22:00, and some control-room shift working will therefore be required to support operations.

**Notes**

1. Participation in the scientific programme is encouraged, through the sending Association.
2. Publications are encouraged.
3. There will be no direct staff or financial responsibility.
4. Work on hardware systems must comply with the CCFE safety systems and procedures.

**Contact(s):**

**General Contact:** Klaus-Dieter Zastrow ([Klaus-Dieter.Zastrow@ccfe.ac.uk](mailto:Klaus-Dieter.Zastrow@ccfe.ac.uk)), JET Diagnostics Unit Head

**Technical contact:** Peter Lomas ([Peter.Lomas@ccfe.ac.uk](mailto:Peter.Lomas@ccfe.ac.uk)), Plasma Operations Group Leader.

Applications through the Head of Association to the JOC Senior Manager, Tim Jones, by 19<sup>th</sup> November 2012. Later applications will be considered if the post remains unfilled.

**Note that candidates who are not EU nationals will need to obtain a visa to work in the UK. The JET Operator can provide advice on the issues involved and candidates are recommended to investigate before interview.**