Summary: Development of a Water Flow Restrictor for ITER

1 Introduction

ITER will be the largest and most complex vacuum system yet to be built. Situated in Southern France, adjacent to the French CEA Cadarache site, the ITER facility covers approximately 190 hectares and is designed to study the fusion reaction between the hydrogen isotopes tritium and deuterium.

It is expected that water leaks from the Tokamak Cooling Water System (TCWS) Primary Heat Transfer Systems (PHTS) into the main vacuum vessel will result in a reduction of the availability of the ITER machine. Method(s) of leak localisation and repair must be developed to minimise machine down time caused by leaks.

Due to the complexity of the machine, and the progression to an active environment, traditional methods of leak localisation may not be applicable to ITER. Personnel access to facilitate in-situ leak testing will be at best limited and during the active phase of the project severely restricted. Hence a challenge for ITER is to develop methods of leak localisation capable of operation in the ITER environment, with a minimum of human intervention and loss of machine availability, capable of sub-centimeter spatial resolution.

2 Scope

Under the scope of the contract the Contractor shall design, manufacture and test an in-line flow restriction for use in the blanket PHTS.

2.1 Planned Approach

The following describes how the work envisaged in executing the project will be performed

2.1.1 Design

The Contractor shall perform the design of a water flow restriction for use in the ITER PHTS. The restriction shall satisfy the requirements for the ITER project in terms of:

- Operational parameters
- Operating conditions (radiation environment etc)
- Materials of construction
- ASME B31.1

2.1.2 Prototype Manufacture

The Contractor shall manufacture a prototype flow restrictor to the design developed as part of this contract. The purpose of the prototype is to demonstrate the valve performance meets the specified requirements.

3 Schedule

Action	Tentative date(s)
Call for Pre-qualification	12 July 2010
Call for tender	16 August 2010
Tender submission	04 October 2010

Contract Award	End October 2010
Start of contract	November 2010
End of contract	May 2011

4 Experience

The potential tenderers should have proven experience in the following areas:

1) The Contractor and its personnel shall have adequate experience in the design and manufacture of water control devices for use in a nuclear environment.