

Boiling Water Reactor - BWR

Primary Pipework Inspection



PET Scanner

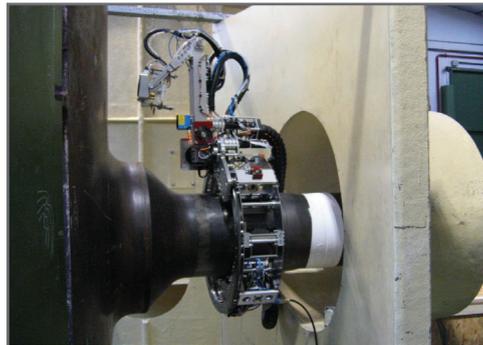


Pipe Elbow Tracker

Reactor pipework within a BWR is ferritic with a stainless steel internal cladding. The composite structure of the pipework means that the integrity of the cladding needs to be monitored. As the parent pipe is ferritic, magnetic crawlers can be used for scanning. Phoenix ISL were commissioned by BKW of Switzerland to develop a system capable of scanning pipework from 4" up to 20" diameter around the full circumference of the straight sections of the pipework and the extrados on the bends. The design maximises the scanning achievable for minimal access to the reactor containment.

Robotic Inspection

Nozzle Inspect Robot



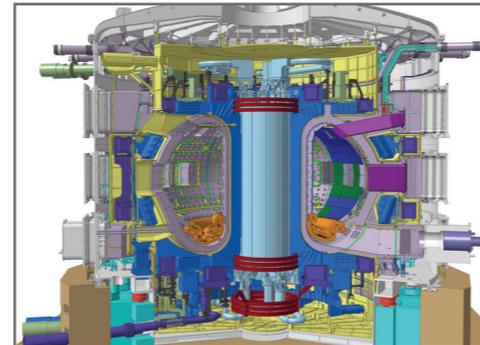
Phoenix ISL can develop new methods for the inspection of nuclear power plant and previous work has concentrated on the application of robotics to provide adaptable solutions to the inspection of nuclear components in fabrication, pre-service and in-service inspection.

Programmes include work on NozzleInspect, a €1.4 Million EU funded research project, in conjunction with companies from five other European countries and TWI in the UK. Phoenix ISL have also had an EPSRC Engineering Doctorate programme with the Research centre for Non Destructive Evaluation (RCNDE), to develop autonomous vehicles and portable robotic arms.

Phoenix ISL have supported a number of clients in the development of portable robotic inspection systems for the inspection of critical nuclear components.

ITER

ITER Reactor



Phoenix ISL were involved in the early stages of the International Thermonuclear Experimental Reactor development programme, working with Fusion for Energy (F4E), Iberdrola and AMEC. Projects for the programme have been on the development of:

- Techniques for the inspection during manufacture of the First Wall Panel, the inner wall of the pressure vessel, which uses Hot Isostatic Pressed (HIP) joining of beryllium, copper alloys and stainless steel flat and tubular interfaces.
- Inspection techniques for the pressure vessel segment welds, in particular the splice joint site welds, where scanning access is restricted, and the proposed use of austenitic stainless steel narrow gap welds makes the inspection techniques more challenging.

AGR

Mission Critical Inspections



The Advanced Gas Reactor (AGR) is a gas cooled reactor design used in the majority of the United Kingdom nuclear fleet. Phoenix have worked closely with the U.K. nuclear industry for many years producing bespoke systems for the inspection of AGR and Magnox stations.

Phoenix ISL have been called upon for mission critical inspections of the UK fleet where our experience and flexible approach, with a problem solving ethos have been recognised as vital to the success of the project.