



# Analysing the Welding Process and Post Weld Heat Treatment

## Case study

The main coolant pump (MCP) provide a reactor coolant flow rate that is sufficient to remove heat from the reactor core and limit the temperature of the fuel, thereby maintaining the integrity of the fuel cladding. It also provides a sufficient flow to ensure the pressuriser (PZR) normal spray operation.

During plant start-up, the MCP are used to enable the Reactor Coolant System (RCP [RCS]) temperature increase. Additionally the MCP seal system acts as a barrier to the release of radioactive material.

The supplier for the HPC EPR MCPs is AREVA NP (Jeumont, France), also the supplier for the previous EPR project (Flamanville 3 (FA3) and Olkiluoto 3 (OL3)), and has already manufactured MCPs similar in design to that proposed for the HPC EPR reactor.

**The MCPs are Nuclear Pressure Equipment (NPE) and are subject to the associated requirements and High Integrity Components (HICs)**

## Our Approach

Our principal engineer Mike Nielsen, was involved in carrying out the lead review of stress reports for the first hydro-test in 25 years of the UK nuclear primary circuit equipment. The analysis was performed by Framatome (FRA) and reviewed by EDF NNB as an intelligent customer. The aim is to produce a detail technical report substantiated in past experience in order to achieve certification from a 3<sup>rd</sup> party insurer to enable commissioning.

As Lead Reviewer, Mike challenged this based on experience of assessment of existing UK plants to ensure that the report contents and structure considered the need for though-life integrity assessments.

He was also significantly involved in assessing parts of the design making major comments on the omission of relevant failure modes.

## The results

Working collaboratively, but also knowing how to be humble (which is one of HPC's project values) we achieved our common objective and deliver on NNB needs as a customer, but what's more important through very detailed technical discussions, we learned valuable lessons and transferable knowledge from working with the FRA team who have a lot of experience of producing these technical