Perform an analysis of the risk of Primary Water Stress Corrosion Cracking and optimize your Aging Management Program

The challenge
Primary water stress corrosion cracking (PWSCC) phenomena affect Alloy 600 base material as well as Alloy 182/82 welds. Depending on design, Alloy 600 zones can be found in the following areas:
• Bottom Mounted Nozzles (BMN)
• Reactor Pressure Vessel Head (RPVH) penetrations and radial guides
• Dissimilar Metal weld (DMW) on the reactor pressure vessel (RPV) pressurizer nozzles

The condition of these zones with respect to PWSCC needs to be assessed within the scope of Periodic Safety Reviews and license renewal processes for PWR plants, and adequate Aging Management Programs must be implemented.

The solution
AREVA can propose solutions for every step of the Aging Management Program, in line with the regulatory framework:
• Evaluation of risks and life prediction
• In-service inspections
• Repair, replacement or mitigation strategies

Focus on Risk Determination Studies
• Evaluation of the PWSCC sensitivity of the Alloy 600 base metal and 182 weld metal
• Evaluation of the residual stress level in the base and weld metal of the BMN using leading-edge measurement technologies and welding numerical simulation
• Assessment of the PWSCC risk, and of the time to initiation or of crack propagation
• These assessments allow a solution to be implemented in an optimized time frame, according to customer constraints

Possible Scope for Inspection
• High performance volumetric and surface inspection of RPVH penetrations, BMN base metal and of base metal/weld interface
• Advanced surface inspection of RPVH and BMN J-Welds (volumetric under development)
• Volumetric inspection of the DMW
• Volumetric inspection of radial guides welds

Focus on Component Replacement
• Reactor Pressure Vessel Closure Head (RVCH). We tailor RVCH installation services for each customer’s plant configuration. Specialized options include modifying the containment hatch and performing ingress/egress studies.
• Pressurizer replacement as well as a full range of associated services can be offered and adapted to specific requirements and depending on reactor type.
Your benefits at a glance

- Competencies to assess the condition of your RPV alloy 600 zones, predict their evolution, and propose repair solutions
- Support to help you select the optimized scenario adapted to your constraints
- Engineering, NDE mitigation, repair and replacement