SNC·LAVALIN

Nuclear Reactor Components and Mechanical Engineering

SNC-Lavalin Brings Proven and Reliable Global Experience

Owners rely on SNC-Lavalin's expertise and experience in nuclear reactor component design and mechanical engineering. Our experts provide piping and supports design and analysis, fitness-for-service support and analysis, three-dimensional piping layout and drafting, mechanical, materials, welding, and chemistry engineering.

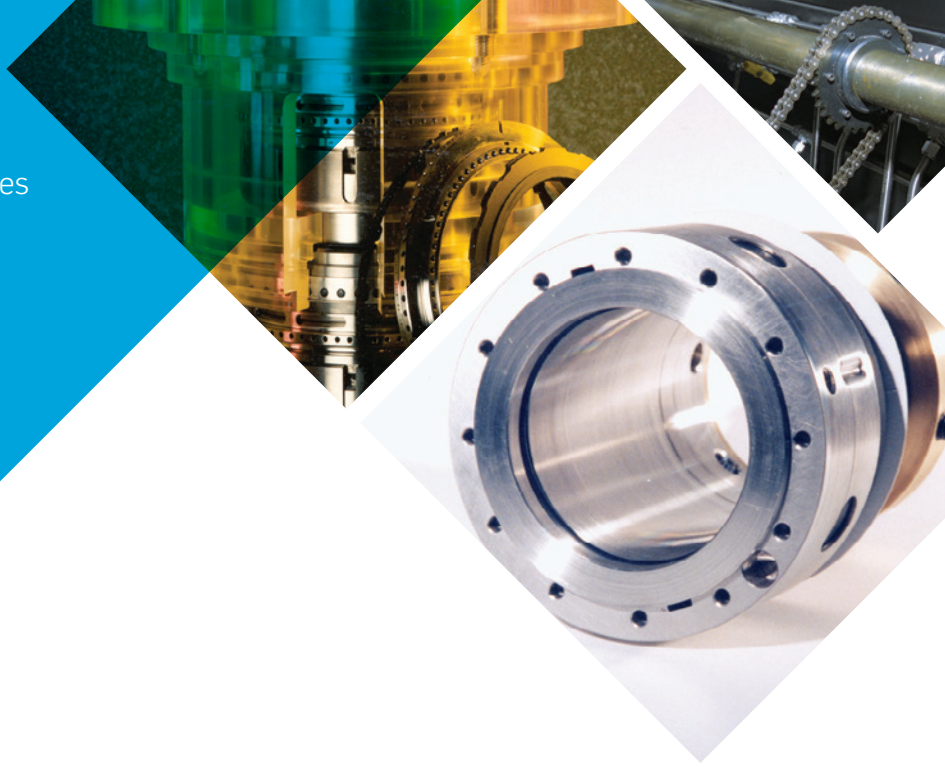
Our design and qualification activities are in compliance with ASME Section III for pressure-boundary and the international standard ISO 9001. We provide technical, support and management lead functions to existing BWR, PWR and PHWR reactors, including operation and outage management, uprates and new build projects.

Material welding and chemistry engineering

- Selection of metallic materials and resolution of welding issues in design, procurement, manufacturing, installation and operation of components
- Analysis of degradation mechanisms and corrosion prevention
- Non-metallic materials analysis, including plastics, elastomers, lubricants, and paints
- Qualification of welding processes
- Manufacturing process support including coating, heat treating, cleaning, forging and pilgering
- Investigation of failed metallic components and piping
- Wear and corrosion-resistant coatings and plating
- Tensile, hardness and fatigue testing

Our full service multi-disciplinary BWR and PWR engineering services team includes experts in:

- PRA
- Reactor Physics and Safety Analysis
- Seismic
- Civil
- Mechanical, including Process Systems and Chemistry
- Electrical, Control & Instrumentation



Piping analysis and mechanical engineering

- Stress and thermal analysis for system piping and supports in compliance with ASME Section III Division 1 and B31.1
- Certification of stress analysis reports for various piping classifications (i.e., ASME Section III, class 1, class 2 & class 3, and ASME 31.1)
- Analysis of pipe supports to ASME NF requirements
- Confinement and containment seal plates to ASME NF and NE
- Seismic qualification analysis (using response spectrum technique and time history technique) and margin assessment based on the EPRI methodology
- Fitness for service assessment of piping systems, components, and equipment
- Drop (impact) analysis for containers and flasks
- Large deformation, non-linear analysis such as pipe whip
- Expertise in piping and structural stress analysis tools such as ANSYS, LS-DYNA, PIPESTRES, ADLPIPE, STARDYNE, STAAD, etc.
- SolidEdge modeling and design drafting
- Nonlinear stress analysis (geometry, contact, material non linearity); buckling analysis; thermal analysis including transients
- Structural analysis major equipment and safety products

Piping layout and design

- 3D CADDS layout for piping/equipment and 2D field construction drafting design
- Multi-disciplinary module design
- Pipe spool and pipe block design
- Module transportation and installation requirements
- Equipment removal and laydown requirements
- Technical specifications of nuclear and non-nuclear pipe & fittings and permanent & removable insulation
- SmartPlant Enterprise (P&ID, 3D, Foundation & Review), SolidEdge, SolidWorks, Microstation, and AutoCAD

Component integrity

- Lifecycle management plans for outage planning and continued maintenance
- High energy piping lines rupture analysis and assessment
- Probabilistic equipment assessment
- Assessments to disposition piping flaws, including leak before break analysis
- Structural integrity analysis of components
- Non-linear finite element analysis, vibration simulations, impact simulations, linear and non-linear flow induced vibrations and structural mechanics

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Please contact us to discuss how our expertise can support your current or upcoming needs.

nuclear@snclavalin.com

www.snclavalin.com/nuclear