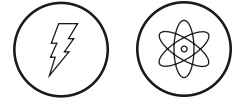




SNC • LAVALIN



Electrical, Control, Instrumentation and Computer (ECIC) Capabilities

SNC-Lavalin Brings Proven and Reliable Global Experience

SNC-Lavalin's nuclear experts offer comprehensive electrical, control, instrumentation, and computer (ECIC) engineering support during all phases of plant life-cycle from scope definition to decommissioning.

Our technical expertise includes electrical, conventional and safety critical control, nuclear instrumentation, human factors, real time computer systems hardware and software engineering in support of nuclear plant design and design changes.

Control and Instrumentation System Design

- > Plant modeling, control system static and dynamic analysis, troubleshooting and improvements
- > Design, specification and procurement of systems, components and field instruments
- > Programmable logic controllers, standalone controller, analytical instruments, alarm units, field instruments, panel mounted instruments, etc.
- > Instrument cabinets, control room panels, alarm annunciators, computerized safety parameter display system and visual display units (VDUs)
- > Environmental and seismic qualification of electrical and process control equipment
- > Nucleonic instrumentation
- > Equipment control and process monitoring, including vibration, pressure and temperature





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



Product lines include:

- > ACCIS display systems
- > PROTROL control services
- > CAMLS active annunciation system
- > NILTA and ATLIN digital system test environments

Human Factors Engineering (HFE) Services

- > NUREG-0711, NUREG-0700 and MIL-STD-1472(G)
- > Integrated safety reviews of existing plants against current standards
- > Operating experience reviews and licensing support
- > Functional requirements analysis and function allocation
- > Design verification and validations
- > Preparation of human factors engineering program plan and design guides
- > Human reliability analysis

Electrical Power Analysis

- > Develop electrical models to perform electrical power system analysis using ETAP software
- > Load flow, short circuit studies
- > Arc-flash studies
- > Harmonic analysis
- > Perform protective coordination study and relay settings

Electrical Engineering Services

- > Detailed electrical systems design, modification, procurement and power analysis
- > Independent third party design review for electrical systems
- > Plant life management (PLiM) for electrical systems and components
- > Design of power distribution systems for grid connected system
- > Class 1E systems design
- > Software categorization of UPS, VFD and verification of vendor software QA programs
- > Environmental and seismic qualification of electrical equipment
- > Switchgear, MCC, transformers, diesel generators, UPS, batteries, cables, containment penetrations for cables
- > Design of automatic start of emergency power generators (EPG) and sequencing of loads
- > Detailed wiring and cabling routing design using IntEC database or client databases such as on-line-wiring

Computer Systems, Hardware and Software Services

- > Full-scope design, procurement, testing, and technical support for computerized control systems, display systems and safety systems
- > Obsolescence management and equivalent replacements for legacy equipment
- > Verification and validation of programmable electronic systems
- > Mission critical safety system software and safety-related software
- > IEC 61513 Class 1 systems computerized safety systems
- > IEC 61513 Class 2, 3 systems (safety-related) plant control and display systems
- > Full-scope plant control distributed computer systems
- > Control system digitization upgrades
- > Safety assessment and categorization in accordance with IEC 61513, IEC 62138 and IEC 61226
- > Cybersecurity plans and assessments applying NIST SP800-53 and RG5.71



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

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www.snclavalin.com/nuclear