Lockheed Martin is the world’s leader in providing safety-critical nuclear instrumentation and control (I&C) systems for naval submarines, aircraft carriers and surface warships for over 50 years. For the past 30 years, Lockheed Martin has incorporated digital technology making I&C systems much more reliable, with finer controls, increased efficiency and longevity. Our systems are currently operating aboard all U.S. Navy nuclear submarines and aircraft carriers deployed worldwide.

**Nuclear Instrumentation Systems**

Systems that provide operator information and safety systems input relative to the neutron population within the reactor are identified as Nuclear Instrumentation Systems. Both in-core and ex-core monitoring equipment are included in this category. Lockheed Martin provides custom Nuclear Instrumentation Systems fit for purpose.

**Safety System Hardware & Logic Design**

- Providing systems that protect the environment, personnel, community and investment
- Over 50 years maintaining an excellent safety record

**Primary Instrumentation & Control Systems**

- Monitors and controls plant parameters such as water temperature, flow rates, water levels and plant pressures
- Performs autonomous analysis to alert operators
- Provides inputs to protective systems in off-normal conditions

**Total Plant Control Solutions (ISM-X™)**

- New generation of control and automation with innovative Intelligent System Manager
- Provides a fully integrated total plant control solution
- Employs open software architecture and distributed processing to reduce the labor and material costs of implementation while improving overall system performance
- Provides a variety of decision support applications for operators such as damage control automation and data trending and analysis
Secondary/Steam Generator Control Systems

- Monitors and controls the water level in the PWR steam generator within optimal range
- Protects both the main turbine and steam generation systems from damage or malfunctions that may occur at water level extremes

Highly Integrated Operator Control Rooms

- Integrates operator control rooms with modern protective, control and monitoring information to maintain safe, reliable plant operations under all conditions
- Uses state-of-the-art human factors and human performance engineering to effectively address human resource needs
- Delivers the entire solution including engineering, manufacturing, installation and support
- True turn-key operation

Specialized Valve & Motor Control/Control Rod Drive Electronics

- Custom systems designed to interface the control systems to plant components that require highly specialized and accurate control signals
- Provides command and control to move control rods in and out of the reactor core
- Valve and motor controllers are integral to the efficient and safe performance of the power plant
- Driven by primary I&C systems, these specialized systems provide valuable information to assist in performance enhancement and preventive maintenance strategies
- Provides solutions to unique and difficult problems encountered in both new plant construction and technology insertion retrofit activities

Specialized Integrated Sensors

- Employed in modern facilities to sense parameters as water temperatures and pressures, neutron population in the core, control rod position and containment integrity
- Specialized sensors that can be used in various systems allowing state-of-the-art answers to specific needs
- Uses devices such as high fidelity, ultrasonic, measuring systems allowing precision control
- Allows data fusion by information gathered from these innovative sensors and allows superior trending and proactive, predictive maintenance strategies

Independent Verification & Validation (IV&V)

- Comprehensive IV&V services
- Verification and validation of mission critical systems
- Planning and execution at all life-cycle design phases
- Activities are performed by an independent authority

Simulation & Training Services

- Immersive, collaborative and distributed simulation training experience
- Extends existing control room simulators to include the entire facility
- Interactive and realistic scenarios
- Visualization and planning for operations, construction and retrofits
- Engages single or multiple students in real-time activities
- Flexible for ease of updating and maintenance
- Runs on commercial off-the-shelf hardware and software

Cyber Security

- Security design, architecture and engineering
- Security risk assessments
- Red teaming and penetration testing
- Manage Security Operations Centers
- Security awareness and education
- Secure Code reviews
- Disaster recovery services

Training & Logistics

- Critical training and logistics operations performed to ensure safety and affordability
- Simulation-assisted engineering capabilities used to test manufacturing, production and workflow configurations
- Professionals prepared to make critical decisions and take the right actions to minimize risk

Intelligent Microgrid Solutions

- Efficient, reliable and secure energy system that integrates existing power generation assets with new or existing renewable power sources and manages energy demands
- Plug-n-play integration of wide variety of sources and loads
- Multi-mode options allow reconfiguration as assets or missions change
- Seamless fault coordination and recovery
- Automated centralized and distributed control