

GENERAL DYNAMICS

Electric Boat

Dept. 448: Ship Control and Monitoring Systems

Disciplines: Electrical Engineering, Computer Engineering, Computer Science

The Ship Control System integrates fluid, mechanical, and electronic components and systems to control ship's course, depth and attitude. Ship Control engineers are combining practical experience and ingenuity with the latest research from the Software Engineering Institute (SEI) to create a cutting-edge ship control system. The new ship control station, designed by ship control engineers, combines the latest hardware and software to achieve ease-of-use not previously available on an attack submarine. In place of hundreds of hard-wired switches and gauges, the Pilot and Copilot of the NSSN will access the custom graphical user interface (GUI) via touchscreen-equipped flat panel displays and joysticks. Functions are logically grouped on the screens and the operators are able to view all the data they need with just a push of an on-screen button. Driving the ship has never been easier than with the new automatic course and depth-keeping facilities. Prefer to drive manually? Grasp the joystick and with one button-push you have complete control. Variable ballast and hovering operations can also be computer-controlled.

What does it take to create this new ship control station? Though it is a direct extension of years of R&D efforts, ship control engineers are designing the new station now. Design for the shipboard software has begun, and the physical station layout, the chairs, joysticks, and power supplies are also being finalized. Additionally, we have developed a fully working prototype station to support the Concept of Operations Exercise (COOPEX), in which the Navy officers and enlisted personnel relay to us their thoughts on the display screens.

Dept. 449: Combat Systems Engineering & Integration

Disciplines: Electrical Engineering, Computer Engineering, Computer Science

Combat Systems Engineering applies highly diversified skills to produce Non-Propulsion Electronic Systems (NPES) for US Navy nuclear submarines. Leveraging the latest in state-of-the-art technologies, NPES systems are provided for Sonar, Combat Control, Ship Control, Total Ship Monitoring, Tactical and Non-Tactical Data Processing, Exterior Communications, Navigation, ESM, Radar, Imaging, Periscope, and Weapons Shipping and Handling. Engineering opportunities range from initial system design through development, hardware/software integration, test, delivery and implementation of the systems aboard nuclear submarines. After delivery to the nuclear submarines, engineering efforts extend to the analysis and resolution of fleet identified problems, assessment of obsolescence issues, and identification of components for technical refresh. Additional challenges include the design and development of simulation/stimulation systems used during the development and test of the NPES, the development of operational and maintenance trainers used to train the crews, and system and subsystem level configuration management to ensure quality, safety, and reliability standards are met throughout the life cycle of the products. Integrated Product Teams, consisting of Electric Boat and Navy representatives, are formed to ensure systems and revisions are completely and effectively planned for current and future products. Mentors are assigned to new engineers to educate them on processes and policies and to guide career development.

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Dept. 454/737: Tactical Software Engineering

Disciplines: Electrical Engineering, Computer Engineering, Computer Science

Tactical Software Engineering is the Center of Excellence for Software Engineering at Electric Boat. Software engineers work with system and hardware engineers in other engineering departments to design, develop, and maintain a variety of tactical computer software systems and components for TRIDENT SSBN/SSGN, VIRGINIA, and SEAWOLF Class submarines and associated simulators and trainers. Tactical Software Engineering also provides technical leadership for engineering process improvement, software safety, software subcontract management, configuration management, and quality assurance activities within engineering departments. Software engineering development environments are comprised of multiple networks of UNIX, LINUX, and Windows workstations and state of the art software development tools. These environments are used for software engineering and development of embedded real-time computer systems used aboard all classes of nuclear submarines and associated shipboard and land-based trainers. Engineers in these departments participate in systems and software development on projects such as: Ship Control, Ship Control Operational Trainers, Deployable Towed Array, Diesel Generator Control Panel Operational Trainer, Weapons Launch Control, VIRGINIA Simulation/Stimulation, and Integrated Database Management System. Engineers in these departments are involved in: systems analysis, systems management, system test, open architectures, middleware, simulation-based product design and material acquisition, hull, mechanical and electrical systems, nuclear systems, Independent Research and Development, and training systems. Opportunities range from initial system design through development, hardware/software integration, test, delivery, and integration of shipboard systems. For delivered submarines, engineering efforts extend to the analysis and resolution of fleet identified problems, assessment of obsolescence issues, and implementation of modernization programs. Candidates must be able to work with Capability Maturity Model Integrated (CMMI) Level 3 processes. Skills in Ada, VHDL, C, C++, Java, CMS-2Y, FORTRAN, real-time operating systems, and relational and object-oriented databases are desirable. Skills developing graphics, simulations, safe code, and interfacing with electronics are preferred, and networking knowledge is highly desirable. Experienced candidates must have a familiarity with configuration management and quality assurance. Successful candidates for this group should possess the interpersonal skills necessary to energetically embrace the challenges of the disciplined application of engineering, with emphasis on scientific and mathematical principles, methods, and tools to the economical production of high quality safe software.

Dept. 443: Instrumentation, Monitoring and Control Systems

Disciplines: Electrical Engineering, Computer Engineering, Nuclear Engineering

The next generation Aircraft Carrier Electrical group has openings for highly motivated Engineers to work in the area of network based distributed process control, information management systems, digital controls and monitoring for the ship's steam and electric plant systems. The main duty is design/development of the monitoring and control system, and will also include: development of system diagrams, interface with fluids engineers to assure specification requirements are met, ensuring operating panel designs are compliant with the Human Factors Engineering (HFE) Guidelines, design and development of display pages used for

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control, design/development of the Information Level Network, Modeling/Simulation of electric plant operation/behavior and performing Manning Reduction Studies. The candidates should possess knowledge in the areas indicated above or have above average instrumentation and control background. Experience in Programmable Logic Controllers and network based control system design is a plus.

Dept. 670: Process Engineering:

Disciplines: Mechanical, Electrical (Power, Electronic), Civil (Structural), Ocean, Marine, Aerospace Engineering, Physics, Computer Science/Engineering, Nuclear Engineering or Naval Architecture

The Process Engineering group is engaged with all of the functional organizations of the company in identifying and acting upon opportunities for improving our business processes, improving quality, reducing cost, and improving cycle time. Green Belts, Black Belts, Master Black Belts, Process Improvement Chiefs and the Process Engineering management team work with all levels of Electric Boat management to establish measurable metrics for specific areas of the business. The Belts work with their Process Improvement teams to analyze the metrics and identify opportunities to improve business processes through implementation of the Lean Six Sigma DMAIC methodology. Tools such as Value Stream Mapping, Process Modeling, Pareto Charts, and statistical analysis are used to determine the few critical inputs to the process that most affect the process output. The Belts and the team employ tools like Design of Experiments (DOE) and Failure Modes and Effect Analysis (FMEA) to determine improvements. The Belts are expected to work in a hands-on team environment and identify and remove barriers that either slow or prevent the successful attainment of project goals. Belts will assist in the planning, organizing, and execution of processes to run the Process Engineering group. Belts will mentor and coach other Belts, employees, and management in Process Improvement methodologies. Green Belt and Black positions are internally posted. Interested applicants should have a proficiency in basic algebra and be comfortable with Microsoft Word, Excel and PowerPoint. Good interpersonal, organizational, planning, and project management skills are required. In addition, strong communication skills, written and verbal, are essential. Candidates should be self-starters with an attention to details. Positions are open to all salaried and MDA represented personnel.