



## Design for Affordability

**Booz Allen Hamilton delivers a ground-breaking approach for building submarines in the Navy's Virginia class (SSN-774) program, a new class of nuclear-powered attack submarines designed for the Navy's evolving post-Cold War requirements.**

### A New Class of Submarine

The first Virginia-class submarine launched in 2004 and cost more than \$3.2 billion—a price-tag that exceeded estimates given to Navy officials for the planned SSN-774 class of 30-plus boats. The Chief of Naval Operations (CNO), subsequently set a target cost of \$2 billion (2005 dollars) per submarine as a condition for meeting its goal of increasing production from one to two boats per year starting in 2012.

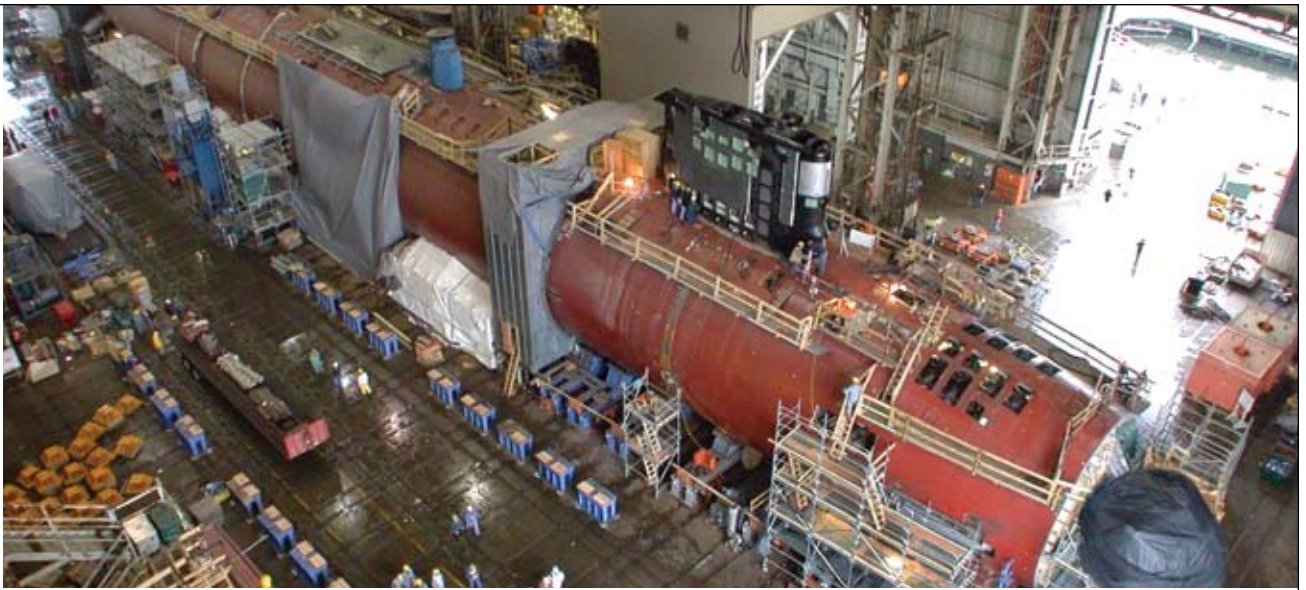
Complicating the cost-reduction mandate was the new, joint production arrangement for building the Virginia class submarines. The nuclear-powered submarines are built jointly by General Dynamics' Electric Boat Division and Northrop Grumman Newport News Shipbuilding under an arrangement in which each shipyard builds portions of each boat, and then the yards take turns assembling the final boat. Because it represented a departure from traditional Navy submarine construction, the joint production method would require fresh perspectives and innovative approaches to achieve the aggressive cost-reduction goals.

### A Ground-breaking Approach

Electric Boat, the prime contractor, brought on the strategy and technology consultants at Booz Allen Hamilton to develop a comprehensive, long-term strategy for permanently reducing costs to \$2 billion per boat.

Working closely with program executives from PEO-SUB and Electric Boat, Booz Allen developed a proprietary approach to Design for Affordability (DFA)—called ISSR (Inherent, Structural, Systemic, Realized). This organic, rigorous approach leveraged Booz Allen's experience across numerous industries to attack inherent program costs in all major areas, including design, schedule, acquisition and sourcing, organizational structure, and labor efficiency. Navy officials approved the plan and Electric Boat selected Booz Allen to lead the effort executing the plan.

Booz Allen assembled a broad-based team of consultants with deep Navy mission and operational understanding as well as technical expertise in Lean Six Sigma, design, innovation, scheduling, acquisition and sourcing, organizational structure, and labor efficiency. Booz Allen's consultants worked collaboratively with more than 200 people on a joint team from the Navy, Electric Boat, and Newport News Shipbuilding to implement the ISSR approach. Together, the team created more than 40 broad initiatives, including more than 250 pragmatic ideas for improving design, scheduling, and other targeted areas, to drive out unnecessary costs in the



*The Virginia class of nuclear-powered attack submarines is designed for the Navy's evolving post-Cold War requirements, and performs a variety of missions aimed at countering both conventional and irregular warfare threats.*

submarine program.

Another vital aspect of reducing and managing costs was helping Electric Boat create a stronger supplier model built on joint cooperation with valued suppliers rather than on continuous rebidding based solely on price.

These comprehensive improvements in management, production, and technical processes have enabled PEO-SUB to reduce costs by \$1.2 billion per submarine and, equally important, double the construction rate to two boats per year by 2012, if not sooner—a significant savings to U.S. taxpayers and a needed boost to our national security.

### Helping Navy Submariners be Ready for What's Next

Within three months, Booz Allen experts, working side-by-side with senior leaders from the Navy, Electric Boat, and Newport News Shipbuilding, charted a course that fundamentally transformed the entire submarine acquisition process, from design to sea trials. Not only were costs reduced by nearly 40 percent per boat in the Virginia-class submarine program, but the processes and initiatives that were implemented are now being used in other shipbuilding and weapons systems programs to help meet cost targets. Booz Allen's unique ISSR approach to achieving program

efficiencies in the submarine program—resulting in a 5 to 1 return on investment for the Navy—will spur similar savings in other major Department of Defense acquisition programs for years to come.

### Ready to Help You

Our work on the Virginia Class submarines is just one example of how Booz Allen's strategy and technology consultants can help military leaders achieve their goals. Our consultants draw from the firm's wide range of capabilities—from engineering and information technology to complex program management—to assemble a tailored team of experts. They bring both battlefield and boardroom experience to every engagement, and their independent perspective and collaborative approach enables them to deliver customized solutions that address each customer's unique challenges.

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