

Partners in Success

The Authentic Business Relationship Cultivated Between Barber-Nichols Inc. and Newport News Shipbuilding Pays Dividends with Lower Cost, Improved Schedule, and Superior Quality

Key Takeaways

- Be a Subject Matter Expert (SME) & Solve Your Customer's Problems
- Solutions Must Produce Results & Provide Return on Investment
- Be a Partner In Your Customer's Success
- Trust & Authentic Business Relationships Allow Difficult Conversations And Real Improvement To Take Place

In 2014 Huntington Ingalls Industries / Newport News Shipbuilding (NNS) awarded Barber-Nichols Inc. (BNI) a multi-year contract to produce MK21 Air Turbine Pump Assemblies for the U.S. Navy's Virginia-Class Submarine Program. The contract for twenty units to be delivered over a five-year period starting in 2015, was BNI's largest contract to date, and the award was based in part on the company's past performance supplying the ten-stage MK21 Air Turbine Subassembly. But this case study doesn't start with the 2014 MK21 Air Turbine Pump contract award, it starts in the 1980s with some engineers trying to figure out how to cost effectively manufacture an extremely quiet ten-stage turbine.

In 1983 design work was initiated on the Seawolf-Class Submarine Program intended to replace the U.S. Navy's aging fleet of Los Angeles-Class Submarines. The Seawolf would be larger, faster, and quieter than its Los-Angeles-Class predecessor and by 1989 engineers at Barber-Nichols and Northern Research were developing the ten-stage air turbine that would be used in the extremely quiet MK21 Torpedo Ejection System. BNI proposed a unique machining process known as Electrochemical Machining which is ideally suited for turbines resulting in superior blade quality while simultaneously lowering cost and improving schedule.

In the 1990s Barber-Nichols used this process to produce the new MK21 Air Turbines for Seawolf Submarines but the end of the Cold War and budget constraints led to the Seawolf being replaced with the Virginia-Class Submarine which is smaller, less expensive, and better optimized for post-Cold War missions. Each Seawolf Submarine cost approximately \$3 Billion to produce and the Navy wanted to produce each Virginia-Class Submarine for half that cost while maintaining quality and performance. The goal known as "2 For 4 In 12" meant that Virginia-Class Submarines would be procured two-at-a-time for a combined total cost of \$4 Billion (in FY2005 dollars) by 2012. The cost reduction efforts started showing quick results with the USS New Hampshire (SSN-778) delivered eight months ahead of schedule and \$54 Million under budget and the USS Mississippi (SSN-782) delivered a year ahead of schedule and \$60 Million under budget.

The Basis of Trust

As Barber-Nichols continued producing MK21 Air Turbines for the new Virginia-Class Submarines it also started performing maintenance services for the Naval Undersea Warfare Center (NUWC); producing additional critical components including the impeller seals, mating rings, and SUBSAFE Level 1 impeller shafts; and establishing itself as a MK21 Air Turbine Pump Subject Matter Expert (SME). To meet the Navy's cost reduction goals shipbuilder NNS needed the support of its supply chain and BNI was able to advise on technical issues and uncover opportunities to improve quality and performance while cutting costs and lead times. BNI's ability to respond quickly and cost effectively solve problems became the basis of trust.

Cultivating an Authentic Relationship

In 2013 the full-up MK21 Air Turbine Pump Assembly came up for rebid and Barber-Nichols decided to submit a proposal because the company was already producing the air turbines and several of the other major pump assembly components. NNS awarded BNI the contract for twenty units to be delivered over a five-year period starting in 2015. During the proposal process Barber-Nichols told NNS they wouldn't be afraid to ask questions, scrutinize technical data, be transparent with the findings, and initiate difficult conversations that make a real difference. Additionally, BNI started meeting with suppliers that produced the other critical components to learn about their needs and key takeaways included outstanding configuration and technical issues and payment terms that caused cash flow challenges. Upon receipt of the award Barber-Nichols immediately started updating the technical data package which resolved many issues uncovered during the supplier meetings and BNI's standard practice of paying its bills in 30 days alleviated the cash flow challenges some suppliers were experiencing. NNS took a risk with a new supplier but by the time BNI made its first shipment, it was the most compliant MK21 Air Turbine Pump Assembly produced to date.

"We appreciate the trust Newport News Shipbuilding has placed in us with this award, and we look forward to a very close relationship that will drive down cost while maintaining the excellent reliability of this mission critical equipment."

**Dan Thoren, President
Barber-Nichols Inc.**

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In September 2016 Barber-Nichols was thrilled to learn NNS was using its relationship with BNI as a model for how relationships should be developed with all their suppliers and the MK21 Air Turbine Pump Procurement Team was honored with Newport News Shipbuilding's Model of Excellence (MOE) Award. Each year NNS honors 140 employees for extraordinary contributions and commitment to leadership, operational excellence, innovative excellence, customer satisfaction, and the courage to make a difference. At Barber-Nichols we take great pride in solving our customer's problems and being a partner in our customer's success!