









Case Histories: Marine

Biach engineers respond to one of a kind problems encountered by customers in many diverse industries.

Deep Submergent Vessel - Manway Cover Bolting	
<p>Customer: U.S. Navy - Annapolis</p> <p>Problem: Navy designed and built a vessel to withstand deep submergent pressures. It had a manway with so many bolts, that at assembly, the corners of the hex nuts were almost touching (only 1/32" clearance). There was no tool on the market that could tighten nuts.</p> <p>Solution: Biach designed a special tensioner with a nut socket that had six fingers which would rotate the nuts after tensioning the studs.</p>	
Assembling Propellers	
<p>Customer: Tracor Marine</p> <p>Problem: Customer had a problem tightening 16 ft. dia., 5,000 lb. propeller blades on U.S. Navy frigates and destroyers. Propellers are made of Al/Br/Ni alloy material and are variable pitch. They had previously used Allen wrenches and drives to secure Morse grip bolts. This procedure was not only time consuming, but residual loads were very uneven. Result was skin divers were often used to re-fasten bolts during the course of routine missions.</p> <p>Solution: Biach engineers developed a complete system of tooling, high pressure pumping unit, and coordinating hoses to meet the customer's requirements. A new tensioning device, the "Tension Bolt", was designed for this purpose.</p> <p>The "Tension Bolt" utilizes a hydraulic cavity built into a male puller bar which then threads into the hole of the propeller shaft housing. By applying hydraulic force against the puller bar, the propeller is pushed into place and the locking nut is seated to retain this load.</p> <p>In this case, the customer inserted the Morse grip bolts in the vacant holes and tightened them to 700 ft. lbs. The pressure was then released at the pumping unit and the "Tension Bolt" was removed and additional Morse bolts were then installed. Thus, the customer utilized the "Tension Bolt" to achieve a greater load than he previously could obtain. Using Tension Bolts at each location would have provided even greater, and more even, loading.</p>	
Slewing Ring Bearing - Heavy Equipment Portal Crane	
<p>Customer: Rotek Bearing, Inc. - Aurora. OH and ASMCLYDE engr. /Craft "Machine Works" Virginia</p> <p>Problem: Customer was assembling a large crane which demanded accurate bolt loading.</p> <p>Solution: Biach developed a special multi-stage tensioner to provide the critical load requirement and fit the tight bolt pattern.</p>	


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Case Histories: Marine, Continued

Naval Nuclear Core Loading for Class 688 (Los Angeles Class) Ships	
<p>Customer: Newport News Shipbuilding and Dry Dock.</p> <p>Problem: Customer had a difficult bolt loading project that required stringent QA specifications.</p> <p>Solution: Biach provided tensioners and pumping units for water operation and met their requirements.</p>	
Submarine Fuel Core Bolting - CDM & Tie Rod Projects	
<p>Customer: Babcox & Wilcox</p> <p>Problem: Projects indicated severe physical restrictions for shipboard applications. Additionally, two different stud sizes needed to be tightened simultaneously at different pressure levels.</p> <p>Solution: Biach designed a unique tensioning system to meet their specific dual load requirements and address the critical clearance problems. Actual operation of the tensioners was performed from above the assembly. A special air powered pumping unit using a shifting air valve provided the ability to pressurize the two studs at different levels.</p>	
Arresting Gear Damper Flow Control Valve	
<p>Customer: Naval Air Station - Lakehurst, NJ</p> <p>Problem: Application indicated a limited space envelope for tensioning equipment. Needed to improve safety in landing system.</p> <p>Solution: Biach developed a 50% system to accomplish this. We then provided ten (10) additional systems for aircraft carriers and land bases.</p>	
Piping Flanges for "Skycatch" Missile Tether	
<p>Customer: Naval Air Station - Lakehurst, NJ</p> <p>Problem: Need for close tolerance precision in this high pressure project.</p> <p>Solution: Biach successfully designed special tensioners for this application. Biach's previous success with arresting gears and inability of competitors to address stringent specs led to acceptance of Biach bid.</p>	
Diesel Main Propulsion Foundation Bolts	
<p>Customer: Avondale Shipyard</p> <p>Problem: Needed tooling for engine mounting on tanker hulls (Japanese diesel). High tensile studs with limited envelope dimensions.</p> <p>Solution: Biach designed special tensioners for metric fasteners with cylindrical nuts.</p>	

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Case Histories: Marine, Continued

Naval Nuclear Core Loading for Class 688 (Los Angeles Class) Ships	
<p>Customer: Maryland Shipbuilding & Drydock</p> <p>Problem: Customer had application with high tensile bolts and tight envelope dimensions.</p> <p>Solution: Biach designed a two piece tensioner to provide required residual load and operation in tight area.</p>	
Main Flange and Stator Caps	
<p>Customer: Westinghouse EMD - Cheswick, PA</p> <p>Problem: Customer needed to provide tooling to the Navy which required special tensioning designs for shipboard use on generator.</p> <p>Solution: Biach developed a special stainless steel two-stage unit, and provided a custom single stage tensioner, both for water operations in sets, along with high pressure pumping systems and hoses.</p>	