Launch and Recovery

Leaders in a Growing Field

Conducting safe and efficient Launch and Recovery (L/R) operations are critical to the success of many ship missions. The need to conduct L/R operations during the day and at night, in high sea states, and with reduced manpower requires a deep understanding of mission requirement and design factors. Innovative analytical approaches and advanced engineering tools coupled with experienced subject matter expertise are critical to L/R success. Demanding operational requirements, novel hull forms, diverse manned and unmanned vehicle systems, and emerging L/R concepts necessitate new thinking. BMT engineers provide that new thinking and are experienced in the design and integration of L/R systems.

Air - Surface - Sub-Surface

BMT works with a diverse range of clients on the integration of manned and unmanned air, surface, and sub-surface vehicles. Our experience and access to leading research in launch and recovery, both in the United States and abroad, enables us to provide a full spectrum of engineering solutions for the challenges encountered in integrating these vehicles into the fleet. Some of the services we provide include:

Technical Feasibility Evaluation - BMT provides engineering assessments for a planned installation. We assess arrangement of existing consoles; operation of command and control; integration of vehicle with other systems and flight deck design; integration and compatibility of communication equipment with aviation facilities; and understand and address requirements necessary for collision avoidance.

Engineering Support - BMT provides engineering services at each stage of the design process by performing early concept studies and preparing detailed technical data packages ready to support production activities. Our intelligent systems enable the solutions we generate for our clients to work in harmony with other mission critical systems and equipment. For example:

- Stern Launch - The integration of stern ramp launch and recovery systems are challenging as components associated with steering gear, ship structure, ramps and closures, mooring, towing, astern refuelling, water management systems, boat capturing, traversing systems and other mission systems compete for the same design space. BMT engineers have contributed to the development of these challenging, dynamic systems on recent Coast Guard vessels.
• Side Davit - BMT engineers are experienced with the characteristics and limitations of various single point and dual point davit systems that are used to launch and recover boats from the ships side. BMT recently developed a virtual reality, man-in-the-loop simulation which allowed an entire four man deck team to simulate the launch and recovery of a 7m mission boat. The quantitative data collected allowed our client to not only determine the feasibility of the installation but develop design modifications to improve the safety and effectiveness of the L/R system.

• Modular Systems – In support of the Architectures, Interfaces and Modular Systems Program, BMT worked with the U.S. Navy to develop the “Guide for the Design of Modular Zones on U.S. Surface Combatants”. As part of this effort, engineers investigated the establishment of a modular architecture to accommodate systems supporting L/R operations to enable change out of L/R mission packages and back-fit of new capabilities.

**Maintenance and Reliability** - Our engineers and maintenance analysts are experts in the development, validation, training, and troubleshooting of davits and L/R equipment. Our work in this area includes: safety assessments, business case analysis, controls design and evaluation, and development of RCM products needed to ensure trouble free operation of L/R systems.

**Physics Based Man-in-the-Loop Simulation** - The BMT Modeling and Simulation Laboratory supports U.S. Navy and Coast Guard projects in evaluating L/R systems under various sea conditions. After a system has been selected for production, our physics based, man-in-the-loop simulation tools provide an effective pre-deployment training aid for the ship’s crew.

**Training** - As the complexity of L/R systems increase and the battle force becomes more dependent on the operation of ship deployed unmanned systems, sailors require specific course material, training aids, and training to effectively operate and maintain these systems. BMT has the capability to provide operator training in the virtual environment and maintenance training on client systems and equipment.

**Human Factors Engineering** - A key aspect of successful L/R system design is the integration of human performance and safety considerations associated with operations and maintenance on the design of the human-machine interface. Identifying and mitigating human error, ergonomic, and injury risks significantly improves operational effectiveness, suitability, and safety. Our human factors engineers are experts at performing human performance analyses of L/R operations and systems to identify design, manpower, personnel, training, and safety issues as well as develop enhancement solutions.

**BMT Designers & Planners** - Successful execution of L/R operations has become a pivotal issue for both military and commercial organizations working in the marine environment. BMT has the expertise and experience to optimize the performance of your L/R system, improving availability, operability, and safety. We have developed mock-ups and worked with the United States Navy Combatant Craft Division on the evaluation of special mission boats. Please contact BMT for more information on how we can assist your organization with air, surface, or subsurface L/R systems.

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