

Requirements Document:

Project Title: Western Flyer ROV LARS Upgrade for Tiburon II

Project # 900729

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1. Scope of Project

The weight of the new ROV, with a safety factor added for SS5, exceeds the capacity of the existing Effer crane; therefore, a replacement crane is required.

2. Requirements

2.1 User/High Level Requirements

1. The new crane shall be capable of safely lifting the new ROV with a tool-sled in the same weather conditions as the existing system operates in.
2. The new crane shall mount to the existing foundation built into the deck of the Western Flyer
3. The new crane shall not exert forces on the foundation that exceed its load rating
4. The weight of the new crane shall be minimized
5. The new crane shall operate with the existing hydraulic power unit
6. The new crane shall have a pivoting, sit-down operators console on the right side of the crane
7. The new crane shall fit through the hole in the top of the moon pool (could be partially disassembled)
8. The new crane shall not impede foot traffic around moon pool (clearance under stowed boom)
9. The new crane shall be capable of servicing spare tool sleds in their existing location on the deck
10. The new crane shall have a Constant Tension (CT), two speed winch capable of quickly removing slack from the lift line, and then slowly lift the ROV, tool-sled, and entrained water, with an appropriate Dynamic Load Factor applied.

2.2 Design Derived Requirements

1. The bolt pattern of base of the new crane, or base adaptor, shall match the existing bolt pattern: 8x 1.5" on a 1066mm diameter bolt circle.
2. The maximum moment applied to the foundation by the loaded crane shall not exceed 62 MT axially and a moment of 62 m-MT.
3. The crane shall be capable of lifting 10,790 kg at a radius of 4.87m from the base (ROV + toolsled + docking head + winch * 1.52 Dynamic Load Factor (DLF))
4. The crane slew shall not back-drive at ship pitch angles of less than 15 degrees (with full load plus 1.52 DLF)
5. The crane shall be capable of positioning the ROV, 3.3 m from the base, 90 degrees from ROV lift point (change tool sled)
6. The crane shall be capable of positioning the ROV at the water's surface, 12 feet below the storage position on the moon-pool doors.
7. In the stowed position, there should be 2.1m of clearance between the deck and the bottom of the boom at a radius of 1.3m to allow people to walk under the boom

2.3 Environmental Requirements

1. Launch and recover the ROV in Sea State 5 (requires a DLF of 1.52).
2. The crane shall be resistant to saltwater spray

2.4 Operational/ Maintenance Requirements

1. The crane shall use stainless steel hoses, fittings and hardware for low maintenance

2. The crane shall be painted with a low-maintenance paint system
3. All bearings and bushings on the crane shall be easily lubricated

2.5 Design Constraints

1. The crane shall fit through a hatch that measures 2.6m x 3.5m (crane could be partially disassembled)
2. The crane shall weigh less than 7000 kg

2.6 Other Constraints

1. The crane shall be delivered to MBARI by June 2008.

3. Interfaces

1. The crane shall be operable with a hydraulic power pack capable of supplying pressure, flow rate and power of less than 350 bar, 127 l/min and 50 hp respectively
2. The crane shall connect to the existing Dynacon ROV Docking Head