CHRISTOPHER J. DUBEA

Portfolio of accomplishments:

- Designed three-axis modular manipulator system for small observation class Remotely Operated Vehicles. System is designed for inexpensive manufacture and to allow maximum flexibility in assembling manipulator configurations to customer specifications.

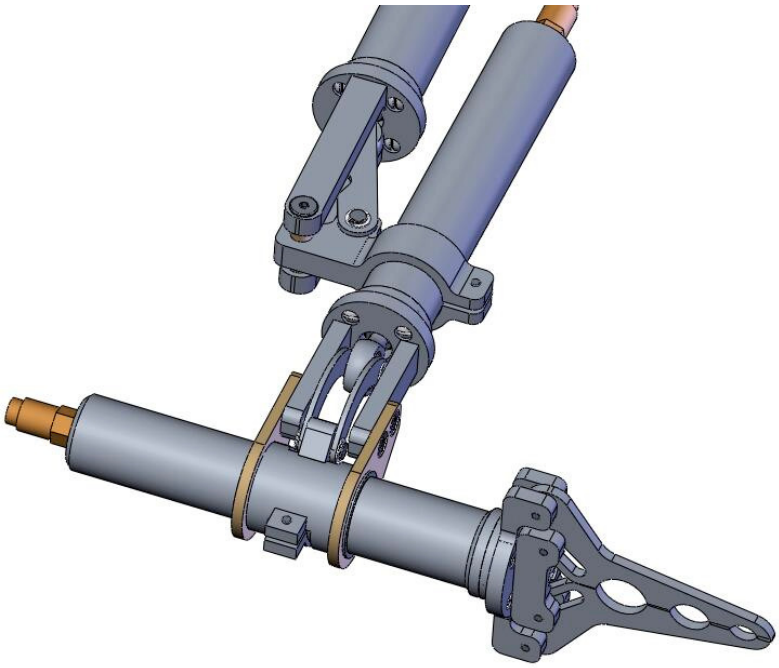

Figure 1

- Developed XML (Extensible Markup Language) based data management tool for managing file information for SolidWorks. The implementation is user configurable and provides a simple, uniform data interface. Data tool can be applied to any third party PDM (Product Data Management) or PLM (Product Lifecycle Management) applications. The application is currently in beta testing, and is scheduled for release early first quarter 2007.

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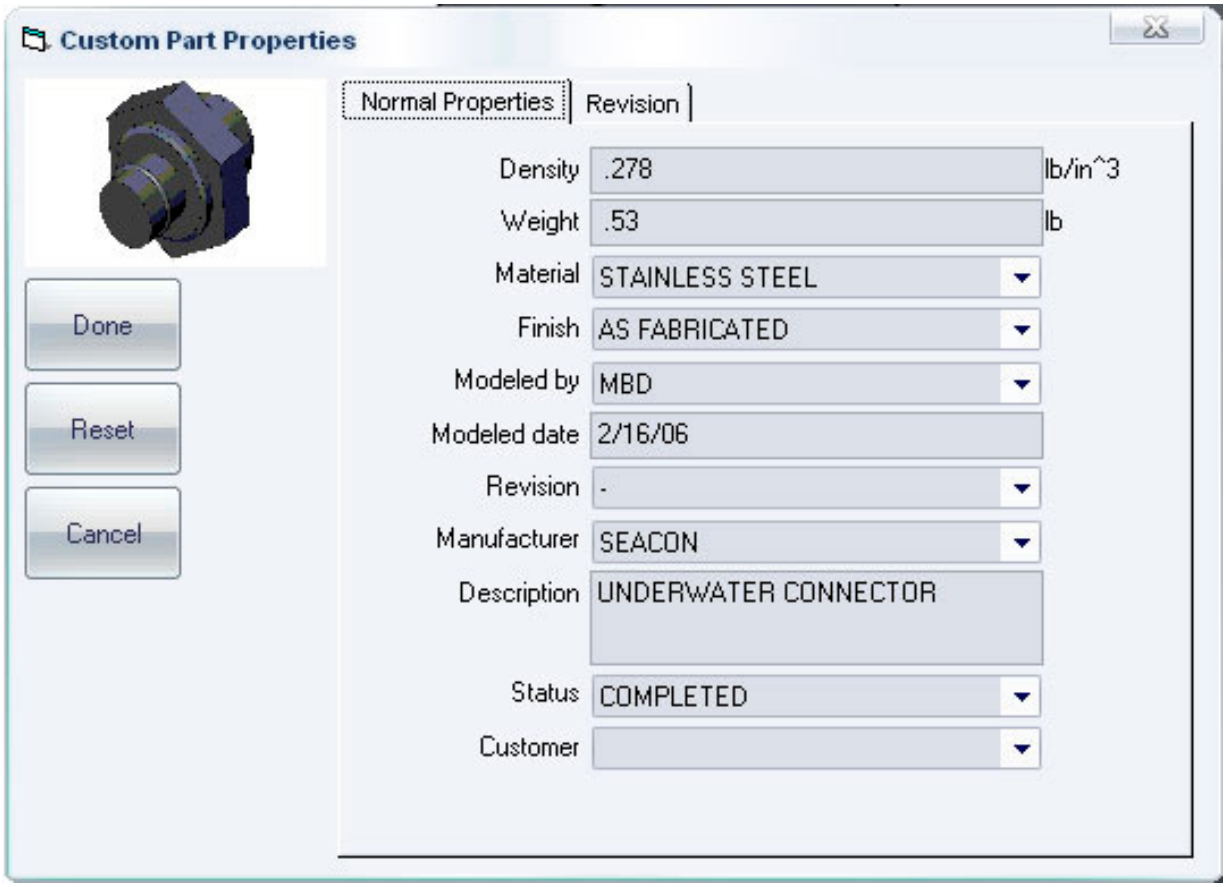

Figure 2

- Managed team in long term project to evaluate and redesign autonomous pipeline plugging equipment for reliability and rapid configurability. This equipment utilizes radio frequency communication to control the actions of the tool in situ through the water and the pipe wall. Following a catastrophic field failure of existing equipment, TDW management engaged my services to embark on a complete review of the product line. Following the review, I made a recommendation to create modular designs for the electronic and mechanical segments of the tools in order to be prepared prior to rapid delivery service orders. The recommendations were accepted, designs were created, prototyped and tested to validate the concept.

- Designed small observation class Remotely Operated Vehicle system. This vehicle won a best of class competition by the military for observation class systems and has thusfar sold over sixty units. The unit contains complete navigation, observation and control systems as in a large multi-million dollar work class ROV, but is contained in an envelope less than $1m^3$ and weighing less than 50 pounds.

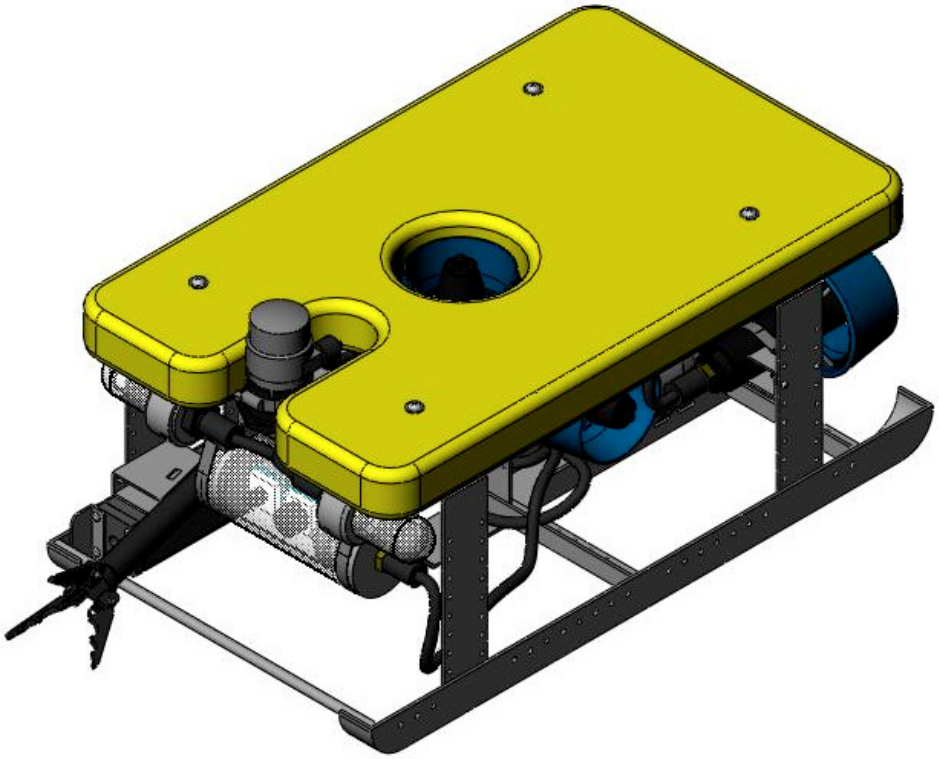

Figure 3

- Developed small reeling system for ROV umbilical handling. This module was designed in conjunction with the previous ROV system for ease of handling of the ancillary cabling needed to control the ROV. Designed to fit in a standard Pelican© type container, this reel holds up to 500 foot of the ROV umbilical and contains an integral slip ring allowing the reel to rotate continuously under operation.

Figure 4

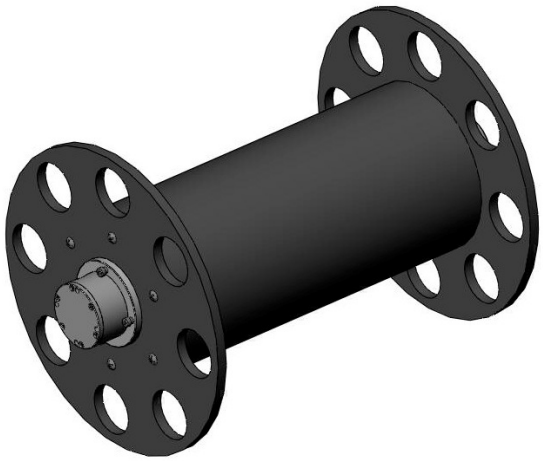

Figure 5

- Developed robotic tooling for actuation of rotary devices in water depths to 3000 meters. The tool (shown in Figure 6) allows user selection of torque ranges from 50 foot-pounds to 2,500 foot pounds in 4 discrete stages. Torque ranges and tool dimensions comply with interfaces set forth in ISO 13628-8. The variable torque ranges are effected without the usage of costly and sophisticated electronics and can be implemented on virtually any hydraulic remotely operated vehicle.

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Figure 6

- Facilitated the development of software and control systems to control operations of a 250-ton cable reel-handling cart for Ocean Dynamics, Inc. Rapid application development techniques were applied to bring the project on line alleviating scheduling issues created during construction of the system. Self-contained touch screen interfaces control all the operations including the reeling and level wind systems, cart movement and system configuration. The cart is shown in Figure 7 and the user interface in Figure 8. The control was written in National Instruments LabVIEW which communicates with a number of discrete Fieldpoint I/O modules. Additional functionality includes a remote control unit that communicates via radio frequencies to allow the operator to control the cart from safe working distances.

Figure 7

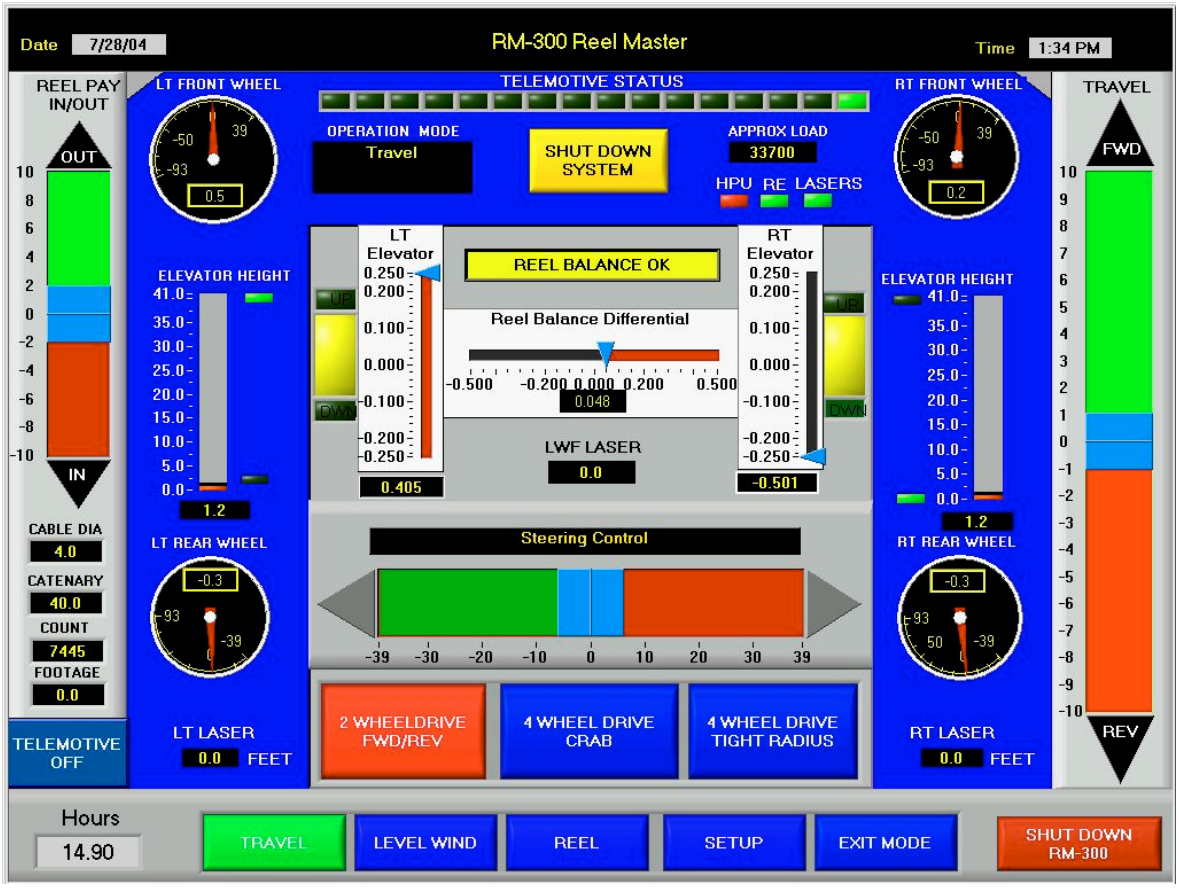

Figure 8

- Created calibration tool as shown in Figure 9 for documenting the torque-input requirements on industry standard under water rotation fixtures. This tool allows a full documentation package to be created for the exact performance characteristics of the rotary interfaces installed on subsea structures. The tool, combined with sophisticated PC based control software written in LabVIEW, operates the rotary fixture throughout the full range of operation while precisely measuring and logging torque values. At culmination of test, an HTML report is created and can be made available for certification purposes.

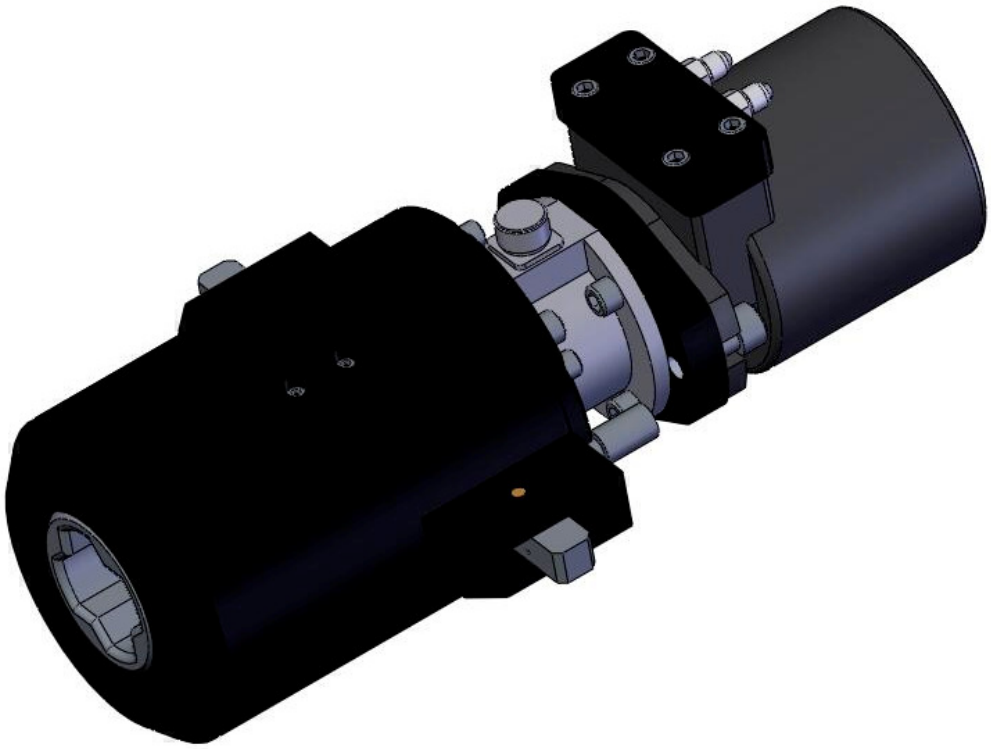

Figure 9

- Developed patented pipeline mensuration device allowing customers to effectively utilize pipeline materiel. The device schedules pipeline segments and orients ends to maximize welding process efficiency and minimize scrap. The tool was designed in a modular fashion allowing commonality between the 5 different tool sizes for different pipe sizes. The arrangement for the 10" measurement tool is shown in Figure 10. In addition, I developed all the electronics for control of the data collection and the control software for a Symbol Palm device. The design and development of this tool led to the award of two patents.

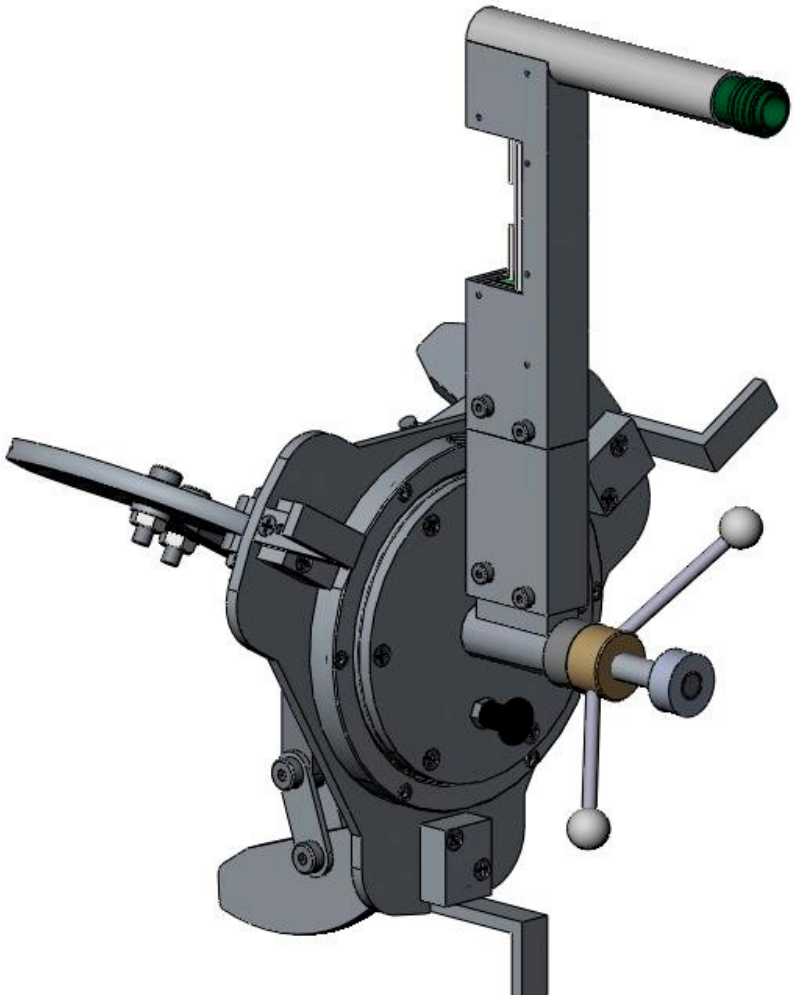

Figure 10

- Secured project and led team in the design and manufacture of automation equipment for a manufacturer of hydrographic sensing equipment. All software was developed in LabVIEW allowing for system-wide control of the machines from a central supervisory location. The equipment comprised the following:

  1) Pin Setter. This device arranged extremely small pins in a fashion suitable for pick and place operations. The pins were inserted into holes drilled in the bodies of the hydrophone coil forms and then the coil form was stacked to restrain the pins. A visual inspection of the completed assembly was performed for QA purposes.

  2) Link Setter. This device arranged a grouping of steel wire D-Rings for attachment to electrical hydrophone cable. The Cable was streamed through a wire measurement and cutting machine with the D-rings installed per user setup.

- Developed wireless control package for operation of an ocean going dredge hopper barge. System was FCC licensable and remotely actuated hydraulic control for safely dumping barge contents. The package was developed for a generic panel PC utilizing National Instruments LookOut SCADA development software. The control console is shown in Figure 11.

Figure 11

- Conceived and developed system to control distribution of all lubrication and auxiliary fluids sold by the Retif Oil and Lubrication Company. The completely automated delivery system was proposed to eliminate nearly $200K per year in lost revenues due to insufficient record keeping practices. A touch screen interface controls all fluid transportation activities and a host computer logs actions to an SQL database for end of month billing. System uses physical interface sensing to prohibit incorrect connection of the delivery hoses and pumps, eliminating contamination of hoses, pumps and tanks.

- Directed team in the creation of SCADA based modular large flow hydraulic manifold for use on a work class remotely operated vehicle (ROV) for Canyon Offshore. This system is used to install suction piles for the foundations of offshore structures. The system modulates hydraulic flow from 0 to 15 gallons per minute using discreet I/O devices communicating with a laptop computer over an RS-232 interface. Data from ambient pressure, water flow rates and height off the sea floor is acquired and logged with the pump output data for report generation. The system was design to operate in water depths to 3000 meters and the interface control was written in LabVIEW.

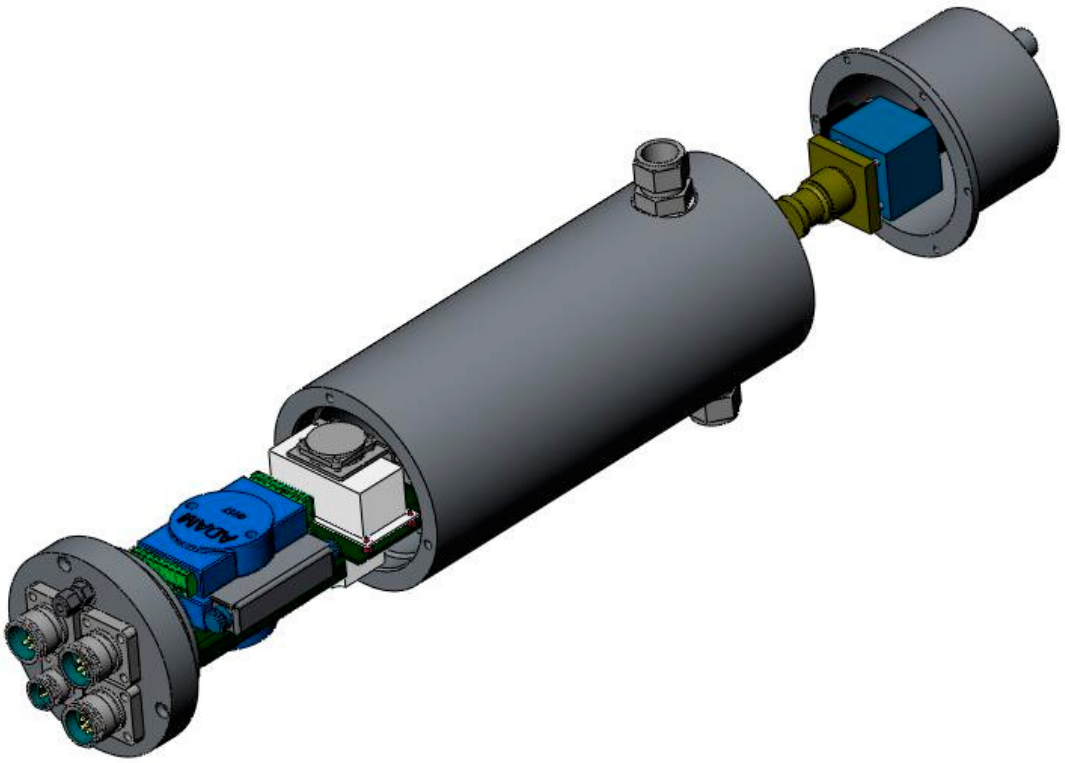

Figure 12

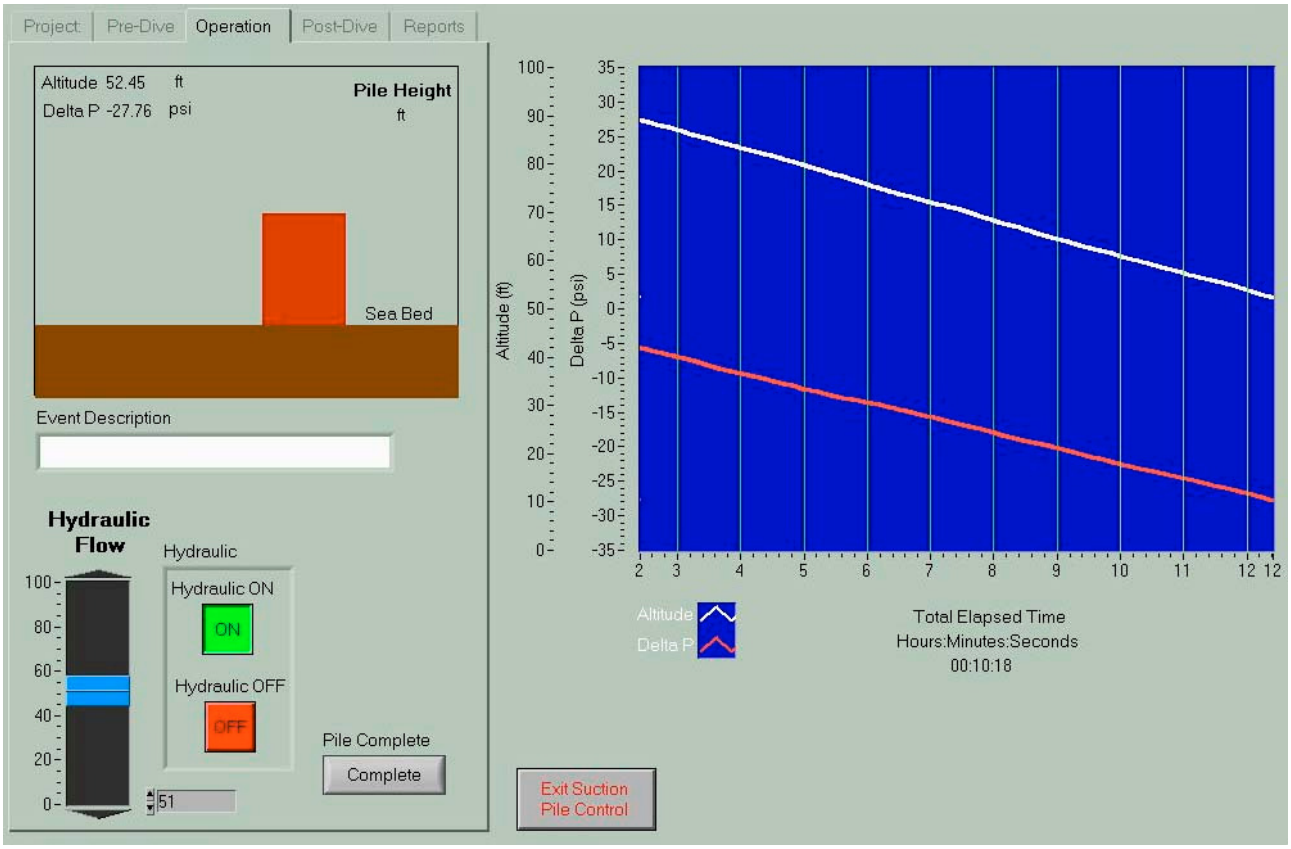

Figure 13

- Managed multi-year, multi-million dollar contract for the development of sophisticated battery charging and testing techniques. The project team included a hostile third party sub-contractor whose involvement was contractually mandatory. Reconciliation efforts were successful allowing the teams to overcome the obstacles and complete the contract. The project and Neptune Sciences later received a technical achievement award for the development efforts on this contract.

- Won contract and supervised design of large-scale shipboard equipment for Navy transportation vessels. The engineering development combined the usage of solid modeling techniques and advanced stress analysis software to produce a design that was light, strong and exceeded the Navy's requirements for shock, vibration and radar cross sectional requirements. Equipment included stern gate assembly (Figure 14) and inboard sideport doors (Figure 15) for the LPD-17 vessels.

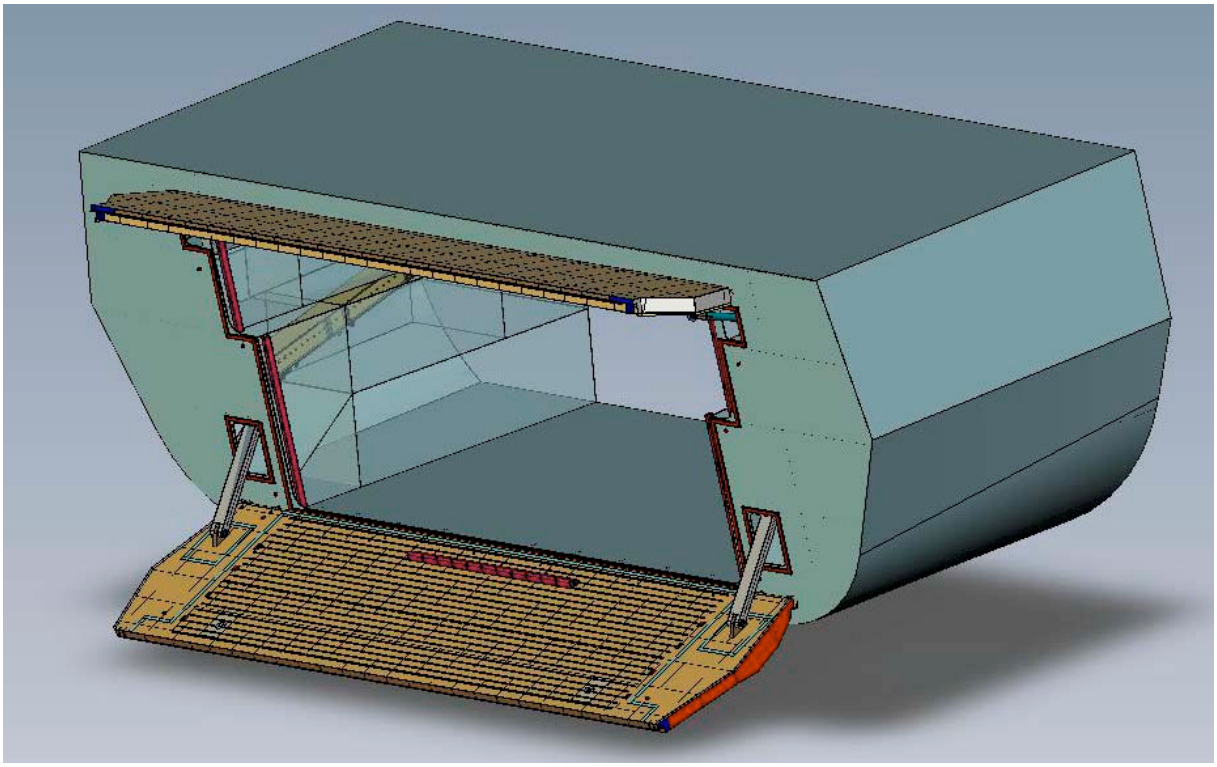

Figure 14

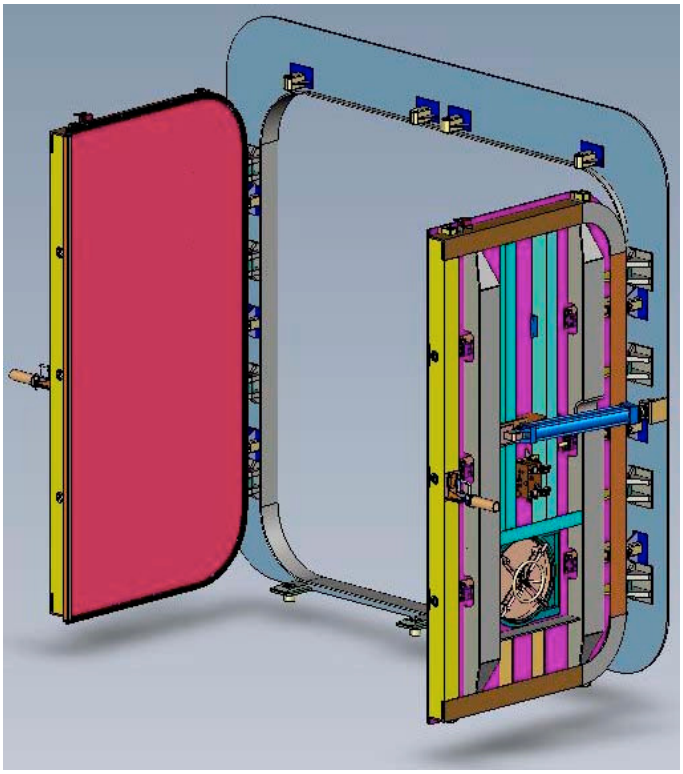

Figure 15

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- Researched, identified, proposed and negotiated a contract for development of large scale underwater robotics systems valued at over $12M. This contract applied technologies developed for the oil and gas industry to non-energy related industries.

- Headed project team in the development and manufacture of undersea robotic equipment for usage in water depths to 5000 meters (17,400 feet). Project was completed on time (accommodating significant scope increase) and under budget. The equipment utilized innovative technology in the development of inertial navigation systems, redundant hydraulic power systems, high voltage electric power systems, fiber optic control and telemetry systems and sophisticated equipment deployment systems with state of the art feed forward control systems. The system, which was designed over 10 years ago, is still in use, and the design won the Parametric Technology Corporation design award for Industrial Equipment in 1999. The system is shown in Figure 16.

Figure 16

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