

William Edward Baxley, P.E.

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Professional Work Experience

President, Baxley Ocean Visions Inc., Hollywood, Florida

Owner of an engineering consulting and services company specializing in ocean engineering and ocean-related survey operations. Designed and built several specialized inspection-class ROV systems for use from small craft in depths to 200 meters. Developed survey procedures and equipment for fish census activities on artificial reefs in south Florida, including State-funded research with Nova Southeastern University and Broward County Department of Environmental Protection. Performed analysis of a proposed ocean energy generation system and prepared a detailed engineering report subsequently used in the design and construction of a prototype system. Performed several bottom video surveys using custom designed equipment in support of Broward County dredging and offshore mitigation studies. Built specialized diver tracking systems for use by commercial divers during seawall inspections and other position-critical operations, increasing survey accuracy and reliability. Developed software programs to integrate magnetometers, side scan sonar tow fish, DGPS units, and underwater tracking systems into graphical display programs for underwater diving search operations. Installed current meter, water level sensor, and data logging system in a central Florida spring to monitor groundwater utilization during periods of cold weather and other low flow events. Built diver propulsion vehicles and other diver equipment for use during underwater archeological projects in south Florida and the Dominican Republic.

Lead Engineer, Naval Surface Warfare Center, Carderock Division (NSWCCD), South Florida Testing Facility (SFTF), Dania, Florida

Duties included the management of all engineering projects at a US Navy research, development, test and evaluation (RDT&E) facility, ranging from concept development to at-sea installation and evaluation. Engineering support was provided as required to other Navy test sites throughout the country, including Alaska, Washington state, and California, as well as locations in the Bahamas. Responsibilities also included management of facility environmental and safety programs, and the role of Division Diving Safety Officer for all diving-related projects.

Project management involved solicitation, proposal, and execution of work for both Federal and private industry customers, from design and development to installation, testing, and evaluation at sea. Project planning involved the selection, inspection and capability determination of work vessels and associated equipment, ship scheduling, funding, mobilization/demobilization, and utilization, all under tight schedule and budgetary constraints. Duties involved the selection and coordination of work teams, specifically chosen for the task at hand. Management of various skill sets, work schedules, and tasking was required to efficiently utilize assets during operations. Required to make authoritative technical and safety decisions during at sea operations to insure the safety of personnel and success of operations during periods of adverse weather or other unplanned events. Report writing and thorough documentation was conducted both during and after operations, providing a clear, concise record of the project and detailed post-project reports. Participation in project in-briefs, out-briefs, and “wash up” meetings was frequently required, with roles ranging from participant to facilitator.

Frequent engineering duties included the layout and oversight of vessel mobilization, load and stability calculations, and evaluation of vessels and equipment for suitability in a variety of operational environments. Design of specialized equipment, such as ranging laser systems, unique load handling devices, pressure-resistant instrument housings and electronics enclosures, and task specific tool packages were also conducted. The planning and orchestration of unique, complex operations involving heavy load lifts and at sea operations was routinely accomplished. The refurbishment, purchase, and/or design of winches, powerpacks, a-frames, and other equipment for at-sea use was required, involving such topics as hydraulics, pneumatics, structures, material selection and protection, and operation/maintenance procedure development.

Specific engineering accomplishments included the refurbishment of the testing facility's underwater tracking system, recovery and replacement of electromagnetic and acoustic sensor systems, installation and recovery of practice minefields, refurbishment and installation of a deep-water (2000 meter) mooring and buoy system, and assorted bottom survey, inspection, and deployment/recovery tasks using remotely operated vehicles (ROV), divers, and submersibles. These projects were conducted in water depths from 20 m to over 1.6 km, in currents as high as 2.6 m/s, using specialized equipment and techniques. These techniques included the use of differential global positioning system (DGPS) equipment, underwater acoustic positioning systems, and integrated real-time geographical information system (GIS) tracking software for precisely performing underwater operations.

The design, construction, and utilization of a specialized heavy-lift ROV (3000m depth / 4500 kg payload) for work in high current environments was completed, and added a significant asset to both local and Navy-wide underwater intervention capabilities. Design required the use of computer-aided design (CAD), finite element analysis (FEA), and printed circuit board (PCB) software, and substantial custom software development, all performed with in-house resources. The management of machining and other fabrication operations resulted in a cost-effective, robust, and reliable underwater vehicle system. Custom software, both control and diagnostic, was written and adapted for a variety of projects. The package included integration of the ROV control program with underwater tracking, cable monitoring, and surface navigation software into a seamless virtual console, including data overlay on the ROV video channels and computer data logging capabilities.

The refurbishment of an existing ROV system, as well as the use and maintenance of other oceanographic equipment (ADCPs, XBTs, CTDs, acoustic modems and releases, meteorological buoys) was conducted based upon project requirements. Procedures such as oil-filling, potting, pressure-compensating, and other pressure-resistant strategies were employed during the construction of various ocean instruments and devices. Several remote, long-term, self-contained environmental monitoring systems were designed and installed for periods up to one year between servicing, relying on satellite communications, data-logging devices and solar powered systems for longevity and reliability.

The implementation of various work vessel types, from dynamically positioned (DP) offshore support ships to smaller, coastal workboats in four-point moors, was often accomplished. The design of the moorings, oversight during anchor plants and entering the moor, and control of vessel movements while in the moor were often performed, in a variety of water depths and environmental conditions. Extensive experience on precision DP vessel, deploying large items within one meter of planned locations in depth to 300 meters, in the high currents of the Gulf Stream, was obtained during many diverse projects.

Environmental and safety management duties included the oversight of all environmental, safety, and health (ESH) programs at the facility, and review of all operations to insure regulatory compliance and safety. As a qualified US Navy diving officer, duties also included the role of division-wide Diving Safety officer. These responsibilities involved the review and approval of all diving-related activities that occur nation-wide throughout the division.

Environmental/Safety Manager, NSWCCD-SFTF, Dania, Florida.

Duties included the management of the environmental and safety programs at a US Navy RDT&E facility in an environmentally sensitive marine area. Issues regarding facility activities, including on-range projects as well as regular base operations were managed to insure regulatory compliance. Frequently required to serve as liaison between the environmental/safety regulatory agencies and the test engineering community, drawing on engineering experiences to provide assistance in meeting both regulatory and project objectives. Management responsibilities also included environmental/safety programs at several other Navy detachments located throughout the country, including Alaska, California, Washington state, and Florida. The development of environmental/safety management plans and annual plan review/revision tasks were performed as required. Compliance documentation and discussion with regulatory agencies was often conducted in support of unique and diverse range operations at each facility, encompassing a wide range of regulations (NEPA, NHPA, RCRA, MMPA, ESA, OSHA). Budgetary functions included annual funding requirement determinations, contract initiation and management, and supply procurement in support of environmental/safety programs.

Routine participation in NAVSEA level Environmental Compliance Evaluations (ECEs) included program reviews and inspections, workplace environmental and work practice reviews, and detailed inspection of process management and procedures. Participated both as team member and as team leader during program-specific inspection activities. Conducted in-briefs and out-briefs at various levels of management, from base commanders to worksite supervisors. Developed inspection reports describing deficiencies discovered, as well as descriptions of successful program areas found during the evaluation. Also conducted workplace safety inspections at a variety of Naval installations, from machine and welding shops, dockside and shipboard cranes, to at-sea operations. Compliance with both Federal (OSHA) and Navy safety regulations were emphasized, and follow-up inspections were often made to verify compliance and deficiency corrections.

Inner-agency coordination duties included the negotiation and subsequent management of site closure activities located within culturally and environmentally sensitive areas, and collaboration with wildlife management organizations in order to gain approval for a variety of acoustic testing operations. Participation in a variety of environmental review boards led to the successful resolution of concerns regarding Native American issues, and potential marine mammal impacts from Navy acoustic testing programs. All of these issues were resolved thru discussion and mutual concurrence, and both the environmental and technical requirements of the projects were satisfied. Environmental Assessments (EA) were developed for these projects as public records of the evaluation and assessment efforts.

Additional Experience

Mentor/Instructor, South Broward High School, Hollywood, Florida

Provided mentoring and after-school instruction to high school students on the design and construction of remotely operated vehicles (ROV) and other ocean-related subjects. Oversaw design, construction, and operation of a student ROV during the 2002 MATE/MTS ROV Competition for High School and College Students at the Kennedy Space Center Visitors Center. Provided mentoring and design review during the 2004 ROV competition at the Johnson Space Center. Assisted with new vehicle designs during the 2005 and 2006 MATE competitions, with the additional objective of a vehicle for use during shark research in south Florida and South Africa. Developed high school and middle school level mathematics presentations used for introducing students from grade 8 thru 12 on the fundamentals of ocean sciences and engineering, specifically in the subjects of underwater robotics and engineering.

Arranged for donations from a variety of vendors in support of student projects. Conducted seminars on ocean engineering and ROV fundamentals to high school and undergraduate students in support of the University of Miami's South Florida Student Shark Program (SFSSP) during the 2005-2006 school year.

Education

B.S. Ocean Engineering, 1991, Florida Institute of Technology, Melbourne, Florida

M.S. Coastal Zone Management, capstone defense scheduled December 2010, Nova Southeastern University, Dania, Florida

Certifications

Florida Professional Engineer (PE), Mechanical Engineering

USN Basic Diving Officer, Class 01-20-BDO, Class Honorman, October, 2001

Publications / Papers

Development of a Portable, Low-Cost ROV System for Shallow Water Surveying, Underwater Intervention 1991

BM-6 Dynamic Deployment Simulation Using Seadyn, presented at MTS Underwater Cable and Connector Workshop, 1997

Environmental Assessment for Santa Cruz Acoustic Range Facility White Site Demobilization on Santa Cruz Island, California, June, 1998

Environmental Assessment for Underwater Active Acoustic Propagation Experiments at the South Florida Testing Facility, Dania, Florida, August, 1999

Environmental Assessment for Relocation of the USNS Hayes to the South Florida Testing Facility, Dania, Florida, August, 2000

Underwater Electric Kite (UEK) Drag Force Calculations and Project Review, with Follow-On Report, prepared for Abacus Controls, Inc., January, 2002

TONGS-An Evolution of a Heavy-Lift Search and Recovery Remotely Operated Vehicle, Underwater Intervention 2004, also published in Underwater Magazine, July/August 2004, Volume 16, Issue Number 4

Applicability of Aerial Photogrammetry Techniques in the Documentation of Submerged Cultural Resources : Digital Photomosaic Development of the S.S. Copenhagen Underwater Archaeological Preserve, Florida and the Musket Ball Wreck, Dominican Republic, Draft M.S. Capstone Paper, Nova Southeastern University, Dania, Florida, 2007