FIVE-YEAR PROGRAM REVIEW

Bob Perkins

Program Name: Small Vessel Fabrication and Repair

Assessment Period: 2009-2014

Program Mission Statement:

The Small Vessel Fabrication and Repair program’s mission is to serve the community as a learner centered open door program providing technical training to meet the demands of companies within the Small Vessel Fabrication and repair industry as well as the needs of the individual. An open exit option allows students to identify their career objectives and participate in program exploration.

Program Student Learning Outcomes

A graduate of the Small Vessel Fabrication and Repair program shall be able to:

• Perform tasks in accordance with American Boat and Yacht Council (ABYC) Standards and best practices

• Secure vessels, safely operate machinery and perform operations associated with dry-docking operations.

• Operate and maintain standard woodshop stationary and portable tools; sharpen, tune, and use standard woodworking hand tools; true wood stock accurately, safely, and efficiently; construct shop fixtures and jigs; and, read, interpret and create blueprints.

• Identify a variety of composite materials, formulate laminate schedules and demonstrate proficiency in laminating techniques, perform standard composite quality control tests, practice quality assurance and safety, and utilize the practical principals of composite-resin chemistry.

• Present a systematic approach to surveying damaged composite vessels and be able to execute marine-quality composite repairs.

• Perform pre-paint preparation and procedures, understand air compressor requirements, utilize common coating application systems, techniques and equipment, and understand and employ multi-component paint systems.

• Fabricate components necessary to build a boat hull from a lofting, practice principals of attaining quality molds, apply spray and manual mold release systems, and calibrate and operate a plural component “chopper gun”.

• State the basic operational principals and maintenance of common marine propulsion systems, and perform basic service and troubleshooting of marine engines.
• Perform trouble-shooting and testing of marine circuits, perform installation of electrical components commonly found on a vessel, perform marine battery service, recharging and installation, and understand and employ corrosion control systems.

• Understand State and Federal wastewater discharge regulations and perform installation and maintenance of plumbing components commonly found on a vessel.

• Survey a sailboat’s rig including running and standing rigging and perform installation and maintenance of systems commonly found on sailboats rigs.

Part I.

1. Executive Summary to Program Status
2. Response to previous program review recommendations.

Part II.

Program Description

Small Vessel Fabrication and Repair is a two-year program whose main goal is to prepare individuals for employment in the vessel repair, fabrication, service and maintenance sector of the marine industry. Students work on a variety of “real world” repair, service and construction projects. Hands-on instruction is provided in composite boat construction and repair, marine woodworking and joinery, lofting, plug and mold construction and marine spray painting systems. Boat yard operation skills are learned and practiced year round. These include marine straddle-lift operation, crane operation, forklift and hydraulic trailer operation. There are also courses that focus on the rigging, mechanical, plumbing, propulsion, and electrical systems of boats.

The faculty offers a wealth of knowledge and experience to the students. Each instructor’s craft has been developed and honed from over twenty years in the marine industry. Faculty repair and building projects and technical articles have been published in texts and national trade magazines.

The majority of instruction for the program is held at the Marine Education and Training Center (METC) located on Sand Island, Oahu. The METC is located on Keehi Lagoon and is a state-of-the-art training facility. It features four large work bays to allow work on vessels up to 45 feet, a concrete pier equipped with two cranes to allow work on vessels in the water, finger piers for removing vessels from the water employing a marine straddle-lift, as well as classroom, laboratory, and office space. The METC ranks as one of the premier training facilities in the United States.

History
The Small Vessel Fabrication and Repair program, (formerly known as Marine Maintenance and Repair) had its beginnings during the Waihee administration. The goal of the program was to establish a training center for individuals to learn how to become marine technicians. Hawaii, being an island state and having one of its major economic drivers as tourism and the associated water-based activities, the demand for competent, well trained marine technicians was and continues to be great. However, because of the economies of scale, and to make a program like this viable, the student population of the program would be more than the State could absorb into its employment ranks. For this reason, the State envisioned the program drawing students from outside Hawaii in order to fill classes. The Department of Economic Development and Tourism provided funding for the construction of the Marine Education and Training Center (METC) on Sand Island. The METC is ranked as one of the premiere marine training facilities nationally.

The program had its first graduating class in 1997. Unfortunately, the program has very rarely been to full capacity, primarily due to lack of marketing. Consideration for a varied curriculum is now being looked at in order to increase student enrollment. Funds for marketing and advertising outside the State of Hawaii to draw students to the program were never fully realized and as such, student enrollment has suffered. It has only been recently that the program has seen its maximum student size of 20 (due to safety concerns) realized. This was and is due in part by the use of endowment monies providing funding for recruitment. Also, VESL’s affiliation with the American Boat and Yacht Council (ABYC) has garnered the program National recognition through ABYC’s marketing efforts. The lack of sufficient local area jobs has and will continue to be a stumbling block for the program in seeing enrollments at the high end of capacity. It is felt however that the student and community may be better served by changing the curriculum.

Program goals/Occupations for which the program prepares students

The program strives to prepare its students for successful placement within the small vessel fabrication and repair industry. Small vessel repair and fabrication is one of very few vocations where a variety of skill sets are required. The marine technician is expected to know composites, marine electrical, plumbing systems, yacht joinery, rigging and propulsion, to name some the major sets. Any one of these skill sets can lead the technician into a specialized area of expertise. Part of the program’s job is to introduce and give hands-on training to the student in these and other specific areas to prepare he/she to build a successful career within that area, if desired.

Because of the training received, some graduates have gone on to pursue jobs in cabinet making, production tooling, and land-based electrical. Some have gone on to begin their own businesses within the small vessel market.

Program Student Learning Outcomes

\textit{A graduate of the Small Vessel Fabrication and Repair program shall be able to:}
• Perform tasks in accordance with American Boat and Yacht Council (ABYC) Standards and best practices

• Secure vessels, safely operate machinery and perform operations associated with dry-docking operations.

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• Understand State and Federal wastewater discharge regulations and perform installation and maintenance of plumbing components commonly found on a vessel.

• Survey a sailboat’s rig including running and standing rigging and perform installation and maintenance of systems commonly found on sailboats rigs.

Admission Requirements

Applications from any U.S. high school graduate, GED (General Education Development) recipient or persons 18 years of age or over who can benefit from the instruction offered are welcomed. Students under the age of 18 may be considered for Early Admission or the Running Start program. Additionally:

For enrollment in the program, students must be able to climb a twelve-foot ladder onto a vessel’s deck, get on the deck, walk around the cabin and descend to the ground in a time period of not more than twice the time it takes the instructor to perform these tasks. The students must be able to jump onto the deck of a boat that is 18 inches below pier level, work in a crouching or standing position for hours at a time, lift 40 pounds from the floor onto a 34 inch high table top, and be physically fit to wear an organic respirator. Each student will be required to obtain a note from a physician stating that the student is capable of wearing an
organic respirator. There are many physical demands and hazards in the boat maintenance and repair industry and the program. These include, but are not limited to, occasional heavy lifting, bending, crouching, and working in a cramped position. There will be exposure to woodworking saw blades and cutters, rapidly moving parts, and live electrical circuits. There will also be exposure to resins, solvents, fuel, paints, exhaust fumes, and dust. Students may get cuts, abrasions, burns, aches, and pains.

Credentials, licensures offered

In addition to an Associate in Applied Science degree the following credentials/certificates are offered:

**Certified Composites Technician** through the *American Composite Manufacturer’s Association*

**Marine Electrician Certificate** through the American Boat and Yacht Council

**Marine Systems Certificate** through the American Boat and Yacht Council

**Forklift Training Certificate**

Faculty and Staff

Robert Perkins-Instructor/Director
Mark Keala Kimura-APT
Rich McCreedy-Lecturer
Clay Ghylin-Lecturer

Resources

The Small Vessel Fabrication and Repair program has two major resources; its facility and its personnel.

The facility, The Marine Education and Training center (METC), located at Sand Island, Oahu, on the shore of Keehi Lagoon, is a state-of-art training facility for marine technicians. It features four large work bays to allow work on vessels up to 45 feet, a concrete pier equipped with two cranes to allow work on vessels in the water, finger piers for removing vessels from the water employing a marine straddle-lift, as well as classroom, library, and office space. The METC ranks as one of the premier training facilities in the United States. The facility also has all tools found within the marine environment including a variety of power hand tools, and all types of floor tools from table saws to 3-axis router tables and vacuum systems, allowing the latest in fabrication and repair techniques to be taught.

Additionally the caliber of its teaching staff is second to none. With a combined experience of well over one-hundred years, the staff brings to the class and labs, experiences and training.
that can only be learned by being “on-the-job” in real world situations. This type of experiential teaching gives the students a taste of the actual job venues.

Articulation Agreements

The program’s inclusion within the American Boat and Yacht Council’s, Marine League of Schools has afforded us the opportunity to be one of a very few Nationally recognized schools having this most prestigious title. Through this agreement, students who pass ABYC’s certificated courses of study are placed on an National data base which can be used by potential employers to validate the educational records of the student.

Community connections, advisory committees, Internships, Coops, DOE connections

VESL’s advisory committee is comprised of many of the marine industry business owners and leaders. Because of the insulator arena the State of Hawaii is, being an island state, the industry tends to be close knit. This allows for a much closer interaction between the program and its advisory committee. Generally, interaction is had with all members at least once a quarter with several being monthly. A more dynamic, less formal exchange of ideas is possible because of this. And this equates to a much better response time to new and innovative technologies.

VESL’s largest community connection is with the Polynesian Voyaging Society (PVS). This non-profit, traditional wayfinding and voyaging society has its home within the Marine Education and Training Center (METC) facility. The voyaging canoes Hokule’a and Hikianalia are berthed at METC’s dock, when they are not voyaging. Literally thousands of individuals frequent the METC to either volunteer with canoe upkeep and maintenance for PVS, or attend non-credit classes in voyaging subjects such as non-instrument navigation, seamanship, and cultural protocol to name a few. PVS’s presence on-sight has also contributed to VESL’s intake of new students many of which are of Hawaiian ancestry.

Distance Delivered/off campus programs, if applicable

No off-campus or distance delivered programs exist.
Part III. Quantitative Indicators for Program Review
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Part IV Analysis of Program

The demand Indicators have gone from unhealthy in the 12-13 report to healthy in the 2014 report. We believe this is do in part to a better economic environment, as was stated in last years report. Also, having intake every two years may prove to be beneficial in providing a higher fill rate. Our efficiency indicators remain cautionary. Fill rate was down however the number of low-enrolled classes went from 11 to 8, a step in the right direction. Under effectiveness Indicators, our successful completion was up 12 percentage points to 100%, and our withdrawls were down. However, our persistence in Fall to Spring and Fall to Fall dropped significantly. Our awarded degrees were up greatly (from 1 to 5). We will begin offering certificate(s) of achievement as soon as the program gets approval. We will be offering external exams in the areas of Composites and marine electrical, which we have done in the past. We also offer forklift training certificates to all students who successfully complete the exam and the practicum.

As stated earlier, discussions have started in order to flesh out whether changing or altering the curriculum would help in serving the student and community, as well as the quantitative indicators. It is also envisioned that Certificate(s) of achievement be established as many students don’t care to receive a AAS degree along with the additional classes and costs associated.
Analysis of Perkins Core Indicators

1P1-Technical Skills Attainment-Though this indicator was not met, it was due to students dropping out without withdrawing. Better than 4 of 5 students reached the technical skills.

2P1-Completion Data Source-As stated earlier, many of VESL’s students are not interested in pursuing their AAS degree. Once the core classes are completed, students pursue job placement rather than take the additional classes needed to fulfill degree requirements.

3P1-Student Retention or Transfer-The retention rate is down from prior years. This is due in large part to students taking the particular classes of interest, then dropping out to pursue employment.

4P1-Student Placement Data-As a good number of students begin self-employment endeavors, and earning cash rather than a paycheck, they are not counted within the Unemployment Insurance statistics.

5P1-Nontraditional Participation-This standard is met.

5P2-Nontraditional Completion-Many students do not care to receive their degree and instead join the workforce. Because of this, this indicator is quite skewed.

Program Student Learning Outcomes

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• Fabricate components necessary to build a boat hull from a lofting, practice principals of attaining quality molds, apply spray and manual mold release systems, and calibrate and operate a plural component “chopper gun”.

Page 11
• State the basic operational principals and maintenance of common marine propulsion systems, and perform basic service and troubleshooting of marine engines.
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• Understand State and Federal wastewater discharge regulations and perform installation and maintenance of plumbing components commonly found on a vessel.
• Survey a sailboat’s rig including running and standing rigging and perform installation and maintenance of systems commonly found on sailboats rigs.

All program SLO’s are assessed each year during the course(s) that the SLO was observed, or the curriculum taught. A major change that will take place is the removal of calibrating and operating a “chopper gun”. Our advisory committee advised us that the operation of this type of equipment is losing favor within the industry due to environment concerns, as well as product quality. In the future, lecture will cover the aspects of the chopper gun, but the hands-on portion will be phased out.

Part V. Curriculum Revision and Review

The following courses were reviewed:

MARR 120
MARR 122
MARR 124
MARR 129
MARR 130
MARR 133
MARR 242
MARR 252
MARR 253
MARR 254

All of the listed courses have been reviewed and it is felt the courses convey the course SLO’s well. Discussions will take place in the next few months as to whether major curriculum changes within the program are necessary in order to better student enrollment and convey a
broader theme for the program. This will include looking at some of the non-credit courses being offered in Polynesian Voyaging and Navigation and seeing if it makes sense to turn them into for credit courses. It is also thought that courses centering on Seamanship and Maritime Leadership be developed to aid in CTE centered courses and curriculum. Our Advisory Committee feels there is a major void within the educational community for this type of training, given the large number of US Coast Guard licensed individuals needed within the maritime tourist industry.

**Part VI. Survey Results**

Student Satisfaction-Most all students leave the program with a feeling of accomplishment and knowledge that what they have learned and the skill sets mastered will go far to land them good paying jobs. The students comments received bear this out.

Occupational Placement-Of the students surveyed after joining the ranks of the employed the majority state that they are in the position they have due to their training received through the VESL program. Those students who do not find employment directly within the marine industry none the less feel their employment is a result of what was learned through the program.

Employer satisfaction-Of the employers contacted, all were satisfied with the training received by new employees coming from the VESL program.

**Part VII. Analysis of Program**

Alignment with Mission-
The program is very much aligned with our Mission Statement. We strive to give the best technical training for Small Vessel Fabrication students. Both our classroom and hands-on curriculum look at the student as an individual wanting to become proficient at the skills put forth in order to secure gainful employment. At the same time, our course of studies are reviewed by marine industry leaders to make sure it is current and up to date in technology and product use.

Strengths and Weaknesses Based on Analysis of Data-
The program’s weaknesses are low enrollment and graduation rate. Its strengths are quality of curriculum and facility. The facility, The Marine Education and Training Center (METC), has been recognized as one of the most modern and complete marine training centers in the country. The METC, its equipment, tools and even its layout provide a very dynamic, well thought out venue for future marine technicians to learn their trade. Add to the facility a curriculum modeled after the foremost Standards within the industry (American Boat and Yacht Council), and this combination puts the VESL program as second to none in these areas. Unfortunately, the data shows low enrollment and a less than impressive graduation rate. Again, graduation rates for VESL does not adequately demonstrate VESL’s student completion rate. This is because many students choose to only take the courses related to the VESL curriculum. Interest in securing a AAS degree is not foremost in many of our students eyes. Getting through the VESL courses and only those courses, then securing employment is what is important. And because of this the program’s completion rate suffers. The largest
negative is the enrollment. Having low enrollment is looked upon often times as the program’s lack of sufficient interest within the community to fill classes. In VESL’s case it is lack of knowing the program is even in existence and lack of adequate marketing.

Evidence of Quality, Evidence of Student Learning-
Both evidence of quality and evidence of student learning can be substantiated by the reviews and comments from the marine industry. Marine Industry leaders have voiced their overall satisfaction with our technicians once they enter the employment arena, in both their hands-on skill sets and overall industry knowledge, which is a direct result of quality practices and learning during the school experience.

Resource Sufficiency-
With budgets decreasing annually, it is becoming more and more difficult to sustain the quality standards necessary to put out top notch technicians. We have had to learn to live with less while at the same time keeping the level of curriculum as high as possible. We are blessed with an endowment fund that allows us to sustain a high quality of education.

Recommendations for improving outcomes-
The VESL program will start offering Certificate of Achievement diplomas to our students once a specified quantity of credits within the curriculum have been completed. This action will allow our completion rate to increase providing a more realistic record of our student’s accomplishments.
We are wanting to increase marketing efforts to increase community knowledge about the program. Also, would like to market out-of-State in order to attract non-resident students to the program. These actions in an effort to increase enrollment.
Take the non-credit courses offered and make them for credit courses to assist with the overall student population of METC.
Increase courses to include culturally significant areas in order to attract a larger student pool.

Though the marine industry feels the caliber of education available at VESL is of the highest possible, a major problem persists, enrollment. The facility was designed and built for a class size of 20, which equates to a yearly completion of 20. There are not enough jobs within the State of Hawaii to employ 20 new marine technicians each year. Economies of scale dictated that the facility be at least as large as it is. To offset the lack of in-state job opportunities, the Administration decided it would market outside the State to bring additional individuals in. Once their education was completed, they would return home to employment opportunities. The marketing was to consist mostly of print ads throughout the United States and Canada in order to recruit individuals interested in a career in the marine field. The marketing never came to fruition. As a result, enrollment has never been what it was envisioned to be. In order to remedy the problem, the program has had stop outs every other year in order to decrease the amount of “empty seats”. Though these stop outs help, it is only a stop-gap answer.
Part VIII. Action Plan

Review existing VESL courses to explore the possibility of dropping some in exchange for new courses with a larger interest base.
Research Vessel Seamanship program, allowing students to receive their US Coast Guard papers for manning vessels within the tourism and commercial marine industries.
Establish Certificate of Achievement to increase completion rates.
Change non-credit courses to credit courses to better represent the learning community within the METC.
Fund advertising and marketing outside the State to attract students.
Partner with the Polynesian Voyaging Society (PVS) to develop traditional voyaging courses to fulfill the community’s interest in voyaging and to develop (perhaps) a program utilizing VESL courses as well as new voyaging courses, which could include traditional navigation/wayfinding as well as voyaging topics.

Part IX. Resource and Budget Implications

It is envisioned that resources and increased budgets will be minimal at this time. There may be some curriculum writing personnel costs outside the existing budget. Most additional monies will be covered by VESL’s Loui endowment through the University of Hawaii Foundation.