

MODELING REFORMS IN MARITIME EDUCATION AT  
THE OPERATIONAL LEVEL – THE COMPLETE  
REVISION OF THE DECK TRAINING PROGRAM FOR  
SUMMER CRUISE AT THE CALIFORNIA MARITIME  
ACADEMY

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**Abstract** Practical training for deck cadets in the merchant marine is an essential segment of the complete training regimen. The skills and knowledge-based competencies learned and demonstrated during this training are equally as important as the academic foundations ascribed to the accomplishment of procuring a license upon matriculation from a maritime academy. In the Fall of 2001, the Department of Marine Transportation came to the consensus that the at-sea Deck Training Program for the seniors and sophomores needed a complete revision. A strategic plan was developed and members of the Marine Transportation Department, Maritime Operations, and the Student Health Center formulated a new practical training regimen. This program encompasses fully one-third of the cadets' cruise experience. The program revision required new curriculum development and current curriculum

review, program resource origination, and the creation of assessment and measurement attributes.

**Keywords** curriculum development; program design; assessment; leadership training; resource origination

## 0 Introduction

Since 1931, the California Maritime Academy (CMA) has been actively training young men and women to become officers in the United States merchant fleet and leaders in the maritime community ashore. CMA joined the California State University system in 1995 and is nationally unique as the only maritime academy on the West Coast of the United States. The University currently educates over six hundred and fifty cadets in six undergraduate majors.

Cadets desiring the U.S. Third Mate's license pursue a degree in Marine Transportation. The Department of Marine Transportation (MT department) retains a licensed faculty component of about ten tenure-track professors with several lecturers, as needed. The Department of Maritime Operations (MO department) maintains the U.S. Training Ship Golden Bear (TSGB) and teaches many courses also required in the deck curriculum. Graduation occurs through the successful completion of both the U.S. Coast Guard administered Third Mates license exam, the STCW Officer-in-Charge-of-a-Navigational-Watch, and academic completion of the Marine Transportation degree requirements.

Two critical components of the licensing program are the senior level summer training cruise, CRU 300, and the sophomore level cruise, CRU 100. These two training periods represent sixteen of the one hundred and fifty-nine academic units required for graduation in this discipline. Cadets complete an additional eight unit, junior level cruise aboard U.S. commercial, public, or military vessels.

## 1 Background

In Fall 2001, the Marine Transportation department came to the consensus that the at-sea Deck Training Program, scheduled for the summer semester, for seniors and sophomores needed a complete revision. This training comprises fully one third of all deck cadets' cruise experience, aside from their mid-program commercial ship internship. The IMO's STCW 1995 convention had previously mandated changes to administrative record-keeping of individually demonstrated cadet competencies in license training (an assessor has to evaluate the cadet's performance on a one-on-one basis as competent/incompetent); in response, the summer deck training had been modified from 1998 to 2000 to meet those changes. The consequence of this modification was that a great deal of the practical, hands-on training aspects of cruise were reduced in order to accommodate the time needed for the assessments as mandated by the STCW convention.

The MT department, supported by frequent discussions with the TSGB captains and MO department faculty, reviewed the then existing program. Two Conclusion were unanimously reached by the reviewing panel: 1) the STCW competencies could best be assessed in existing Fall and Spring courses ashore, specifically, components of the Navigational Watch competency could

better be assessed in the Full Mission Bridge Simulator assuring consistency and repeatability. These components were removed from the cruise curriculum. 2) the deck training portion of cruise should be revised as the existing program did not meet the MT department objectives for practical training. This revision should also include a significant component of leadership development.

Several STCW assessments remain as part of the cruise curriculum, specifically, celestial navigation, elements of practical navigation, third class helmsman, fast rescue boat, and aspects of GMDSS. With the exception of fast rescue boat, these components are integral to the watchstanding portion of cruise and required very little modification with the restructuring of the deck training program.

## 2 Strategic development

The MT department formed a subcommittee (Committee) to develop a strategic plan focusing the summer cruise deck training on practical merchant marine exercises. These exercises were centered specifically on the practical skill sets expected of junior deck officers. The Committee determined that half-day modular training best suited the program's design: the 5-day watch/work/training rotations of the summer cruise. Additionally, modular training has a great degree of scheduling flexibility that allowed the coordinators to work around conflicting necessary ship operations, unexpected schedule-changing events, and inclement weather conditions.

A detailed review of the cruise calendars revealed that between twelve and fourteen training days were available for each of the three deck divisions. It should be noted that the only time not associated with training days on cruise are in-port days (watch and work remain in effect). By dividing the available days in half, a total of approximately twenty-four modules were available for training purposes-keeping the training equal for all divisions. (Please see the attached list of topics and the number of modules assigned to each.)

Additionally, the Committee recognized that senior and sophomore training had to be conducted primarily as separate entities; sophomore training to focus on basic skills and senior training to focus on advanced skills, leadership, and the re-enforcement of basic skills. Two personnel, Deck Training Officers (DTOs), would conduct the training, one for each 1/C and 3/C group (group sizes average 15 students). An added advantage of modular training was the flexibility for the integration of first-class and third-class cadets for certain training segments.

The Committee requested training topic input from all deck faculty, the TSGB captains, and students. Again, the topic focus was centered on the practical deck skills deemed essential for junior officers. Additional input from industry was derived from Commercial Cruise evaluations and comments. As a result, the topics represented the aggregated efforts of most of the personnel directly involved with and affected by the training; thus, the broadest and most collaborative efforts were expended by all parties involved.

## 3 Curriculum development

The Committee solicited members of the MT department, MO department, and the Student Health Center as experts in topic fields in formulating and developing the new practical training

curriculum. Additionally, by working closely on cruise with the faculty, ship's department heads, and ship staff, many of these courses were taught by the experts themselves.

Course syllabi and curriculum binders were developed to ensure consistency between cruises and personnel. The purpose was not to stifle academic freedom of the faculty but, rather, to ensure preset objectives were achieved. Indeed, the result was the ability of the DTOs to teach those modules with which they had the most experience and to expose the students to a broad range of industry operational experiences.

During development, certain course curriculum required multiple modules to encompass the material and training. Specific personnel, primarily ship staff (the Bosun to teach "Splicing" and "Knot Tying", the ship's medical staff to assist in "First Aid"), are needed to teach particular topics. Combined with the desire to integrate the first-class and third-class cadets for leadership and teamwork training, the DTOs had to carefully schedule the training before cruise began, keep all personnel involved aware of the schedule, and follow-up throughout the cruise to keep the schedule on track. Leadership training was a particular concern as first-class cadets are assessed on their ability to properly manage peers and subordinates throughout their final matriculation period.

#### 4 Resource origination and allocation

CMA's Academic Administration financially supported the revision efforts. The Committee developed funding needs and a preliminary budget for the first training cycle. Training equipment storage and office space needs were discussed and the TSGB captains allocated a large storage space for the Deck Training Gear aboard the ship as well as secure office for the curriculum texts and high-dollar, fragile equipment.

Under the California Lottery statutes, portions of the lottery monies are allocated to public education. Some of this money, around \$10,000, funded initial equipment needs above then existing equipment aboard the TSGB. Funding beyond first year needs was categorized as newly capitalized gear and sustainable (consumable) equipment. As lottery monies could only be utilized for newly capitalized items, the academic budget was earmarked for annual consumables.

After the first year, it became clear that training equipment utilized in this program must be separate from the operational equipment of the vessel even if this meant duplication. The areas most effected were fire fighting equipment (including SCBA's, turn out gear, cylinder refilling compressors, hoses, nozzles, and foam), and mooring equipment (including mooring hawsers, heaving lines, and stoppers).

This past year, with budget shortages threatening all, a second MT department sub-committee created a cruise fee proposal (later approved) to replace the academic budgetary support and as well as funding for needed repairs for other deck training (i.e. the 60 sextants used by the students each summer). The financial future of the program is thus ensured regardless of University budgetary fluxes.

Early in the resource origination process, the Committee recognized that industry support would be needed to fund some high-dollar capital and consumable equipment. Donations have been

solicited every year. To date: Vallejo Air discounted an air compressor to support the SCBA training; the TSGB Engineering department donated a \$1,000 transformer, built a mount and installed the compressor; the Oakland Fire Department has donated dozens of SCBA bottles and packs with masks on two separate occasions; MMC has discounted meters used in the Atmospheric Testing/Enclosed Space Entry training; the U.S. Maritime Administration donated, and continues to donate, many consumables including firefighting turn-out gear.

## 5 Evaluations

Student Assessments have been a constant source of discussion and argument among the cruise faculty. All recognize the need for formative and summative measures; few can agree on the overall purposes of the evaluations and the form of the instrument. Initially, the DTOs utilized a broad, interpretive and largely comment-type format to be used formatively in improving the program. The main problems were the difference in interpretation among the students untrained in evaluation and the difficulty in statistical analysis of comments rather than a graduated, quantitative scale. While the comments were overwhelmingly positive towards the program, no statistical analysis could be performed due to the open-ended comment nature of the forms.

In the summer 2005 training sequence, a newer instrument was selected that focused on student outcomes using a graduated scale. The student outcomes-based format coincided with the overall strategic focus of the program revision. Additionally, this survey encompasses the entire summer at-sea training regimen: Watchstanding, Daywork, and Deck Training. In future years, the MT department plans to formalize the evaluations and analysis to support the program's budgetary increases as well as assess the strengths and weaknesses of the program. Additionally, ship staff and other involved personnel will be encouraged to assess pertinent portions of the program.

## 6 Conclusion

### 6.1 What the future holds in store

A key strength of this program is its flexibility. As enrollment has increased, the program has been adapted to encompass numbers beyond its original design. Current solutions include increasing the number of faculty, proportionate to the increases in students and subsequent teaching of multiple sections of the training program.

In the near future, the MT department plans to expand the focus of the training program to include a new "training bridge" to be built aft of the current operational Bridge aboard the TSGB. This training bridge will allow remedial training as well as additional exposure for all deck students in piloting, radar, ARPA, celestial navigation, and watchstanding in a real "at sea" environment. This addition would allow the creation of a new Navigation Training Program to handle increased numbers of cadets.

The MT Department considers the Deck Training Program to be a work-in-process responsive to changes in industry and education and exploiting the expertise available at CMA. Additionally, the annual student program evaluations ensure the students have a solid voice in determining the quality and applicability of the program. This evaluation process has already lead to several

modifications to individual module content and to module sequencing.

Whatever changes or adaptations these programs endure, the Marine Transportation Department of the California Maritime Academy maintains a commitment to practical deck training ensuring competent, confident graduates capable of assuming appropriate responsibilities upon joining their first vessel.

## **6.2 First Class Training Modules**

Deck Training Modules	Number of Modules
Safety Inspection	2
Mooring	4
Firefighting	6
Atmospheric Testing	1
Fast Rescue Boat	1
Survival Craft	4
General Seamanship Exam	1
Emergency Equipment	2
SCBA	1
Block and Tackle	2

## **6.3 Third Class Training Modules**

Deck Training Modules	Number of Modules
Trick Wheel (After Steering)	1
Splicing	3
Medical (First Aid)	3
Mooring	4
Knots	1
Ground Tackle	1
Canvas (Constructing a Sea Bag)	1
Firefighting	6
Blocks & Tackle	2
Emergency Equipment	1
SCBA	1