INTERNATIONAL ASSOCIATION OF MARITIME UNIVERSITIES
PROCEEDINGS OF INAUGURAL GENERAL ASSEMBLY
26-29 JUNE 2000, ISTANBUL, TURKEY

STCW COMPLIANCE AND MARITIME ACADEMIES

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ABSTRACT

The six state maritime academies in the United States and the federal U.S. Merchant Marine Academy are degree granting institutions as well as training institutions for the maritime industry. As such they are under the scrutiny of various agencies that evaluate, accredit, or otherwise "audit" their work. These accreditations are very important for the recruitment of faculty and students, for the employability of graduates, and for qualifying for public and private funding.

Accordingly, the requirements of these agencies shape educational philosophy, compete for scarce institutional resources, and profoundly impact the delivery of educational services to students. The adoption of STCW95 Amendments to the International Maritime Organization (IMO) by the United States has added the United States Coast Guard (USCG) as another oversight organization. Compliance guidelines so far promulgated by the USCG and the United States Maritime Administration (MARAD) have the potential for significantly adding to the cost of training mariners in the United States and compromising education for training.

1. BACKGROUND

It is not the intent of this paper to review the STCW95 Amendments to the IMO convention. Rather, it is to trace the general evolution of STCW95 compliance efforts at US maritime academies as it relates to quality education and increased costs. Accordingly, it is assumed that the reader is somewhat familiar with the IMO Convention and the various requirements contained within the latest STCW95 amendments. The following is, however, a summary of STCW95 implementation efforts at the maritime academies relative to costs and impact on the educative mission of those maritime institutions.

General awareness of the new amendments by the state and federal maritime academies began in early November, 1995 at the annual MARAD/Maritime Academies meeting held that year at the California Maritime Academy. At that meeting Chris Young, the USCG representative to the IMO, indicated to the representatives of MARAD, the federal academy and the state academies that the IMO had made significant changes to the regulations covering the certification of watch standers. He indicated that the amendments were designed to promote international standardization in mariner training and to improve the quality of that training through a required quality systems approach to

implementation. Mr. Young also indicated that the United States Coast Guard (USCG) would be the final authority for deciding whether a program in the U.S. complied with the STCW95 amendments. However, he indicated that the USCG had not yet addressed how it would implement compliance in the U.S.

At the next annual MARAD/Academies meeting held in the fall of 1996 at the Great Lakes Maritime Academy in Michigan, there was no representative from the USCG to discuss STCW95 compliance as requested by the academies. Accordingly, To further understand the amendments, most U.S. academies agreed to send representatives to a weeklong course [1] at the World Maritime University (WMU) in Malmo, Sweden.

At that course it was apparent that institutions would be expected to adopt a Total Quality Systems (TQM) type approach to training that emphasized compliance with time regulated modeled courses with task competency "check offs." At the time TQM was under severe criticism in the U.S. as inappropriate for higher education. TQM is thought to emphasize the quantification of expected educational outcomes. However, not all such outcomes are believed to be easily measurable. For example, in many educational institutions' mission statements a student mastering "critical thinking" and developing "lifelong learning" are mentioned as desirable educational outcomes. However, they are examples of outcomes not easily measured quantifiably and therefore difficult to mold into a TQM system.

In addition, there was much reference to IMO model courses that indicated both course content and the hours required of a student to study them. The theory that quality education is measured by how long a student is required to be exposed to material (called "seat time" in U.S. education) had long been abandoned by U.S. accreditation agencies as not recognizing the differences in student abilities and instructor skills. Accordingly, required "seat time" is considered by them to be an impediment to a quality educational experience and inefficient for institutions. These were but two examples of concerns the U.S. academies had regarding how STCW95 might be implemented in the U.S.

Given that there was no USCG guidance yet given on STCW95, and given what seemed to be somewhat alarming information from the WMU course, the academies asked for a meeting with the USCG and MARAD to discuss these issues. In December of 1996 the federal Maritime Administrator, Admiral Herberger, and the USCG Chief of Marine Safety, Admiral Card, met with the representatives of the U.S. maritime academies to discuss U.S. STCW95 compliance. At that meeting, both Admiral Card and Admiral Herberger expressly indicated that no significant changes to academy maritime education would be needed to comply with the new amendments. [2] The academies were much relieved to think that they would not have to significantly modify their currently accredited programs to comply with STCW95, nor had to anticipate any additional financial burden in doing so. However, in November of 1999, the USCG publicly admitted that they "perhaps underestimated the total demands that STCW95 would place on U.S. maritime training and education institutions."[3] What caused this new assessment of the impact of STCW95 on maritime academy education?

The author believes that the USCG and MARAD did not: 1. Understand the mission of maritime education at the academies as stated by the United States Government which demands that mariners be *educated* as well as trained; 2. Understand the nature of higher education in the U.S. as regulated by the various accrediting agencies or; 3. Realize the impact and costs of standardizing all mariner training beyond the common competencies stated in the STCW 95 tables as desired by the USCG.

2. MARITIME EDUCATION AUTHORIZATION IN THE U.S.

In 1936 the United States Congress established Title 46 in the U.S. Code of Federal Regulations to cover merchant shipping. In that Title Congress [4] stated that the Secretary of Transportation was authorized to take the steps necessary to provide the "education and training" of citizens for the safe and efficient operation of merchant marine vessels. Subsequent amendments to the Title 46, Section 310 then delineates the authority to establish a federal maritime academy at Kings Point, New York, and state academies located in the states of California, Maine, Massachusetts, New York, Texas, and Michigan.

Organizationally, the federal academy is overseen by the United States Maritime Administration (MARAD), which itself is a part of the United States Department of Transportation (DOT) in Washington, DC. That department is managed by the Secretary of Transportation who is appointed by the President of the United States. Faculty and staff there are federal employees.

State Maritime Academies, however, are responsible to MARAD only for policy concerning the management of the "any ocean" (over 500T) deck and engineer third-officer watch stander programs. (an example is the MARAD policy that such mariner training be no less than three years in duration) The right to confer an academic degree, ownership of physical plant facilities (other than the training ship), the operating budget, other academic programs and all personnel policies, however, are managed by the state governments of the particular state where the academy may be located.

ACADEMY MISSIONS

What is very important to note in the language of Title 46 is the United States policy intent to *educate* as well as train. Accordingly each academy has developed programmatically beyond a pure training school to a degree granting institution in the higher education system of the United States. (the state academies in Maine and New York also offer advanced degrees beyond the usual bachelor are as well).

While the mission of the federal academy is contained in and controlled by federal legislation such as Title 46 mentioned above, the mission of the state academies are set by their state governments. Accordingly, state academies not only have the federal regulations regarding maritime license policies to adhere to and for mission guidance, but also that of their individual states. In these mission statements there are references to a broader scope of education than just training for shipboard competencies. For example, Massachusetts Maritime Academy[5] includes "fully rounded academic background" and "high quality education" as part of their mission. Maine Maritime Academy[6] includes terms such as "intellectual curiosity" and "public service" as part of their educational program, and California Maritime Academy[7] includes the concept of "intellectual learning" in their mission statement.

These are all statements of intended educational outcomes that go beyond pure training. They involve more than repetitive drilling of actions and rote memorization, or a simple check-off system to determine whether one is prepared to serve as a trained mariner. Accordingly, each of these institutions has an obligation to its students to provide an experience that educates as well as trains. However, Captain William Bennett, Commanding Officer of the National Maritime Center, (the USCG office assigned STCW95 compliance responsibility), has stated that STCW95 "says nothing about education". His remarks at a 1998 meeting between maritime academies and the USCG at USCG headquarters implied that as far as the USCG was concerned, education of mariners had

little to do with their ability to perform safely. As one might imagine, remarks such as that made to institutions which believe that an educated mariner is a better trained mariner, and who believe that they are charged by their government (and accrediting agencies described below) to educate as well as train, were very disturbing.

3. ACCREDITATION AGENCIES INSTITUTIONAL

To be a successful degree granting institution of Higher Education in the United States a college or university must be formally evaluated and approved ("accredited") by one of the eight regional accrediting agencies. Students normally will not attend an institution that is not accredited, nor will most faculties teach at a non-accredited institution. Accordingly, accreditation impacts both the numbers of students who want to study at an institution, and the quality of teaching. In addition, accreditation allows an institution access to a number of funding sources not usually available to non-accredited institutions.

Maine Maritime Academy and Massachusetts Maritime Academy are both in the New England Association of Schools and Colleges (NEASC) region for institutional accreditation. Accordingly, I will describe the NEASC accreditation process for illustrative purposes. Most other regional accreditation associations are very similar.

NEASC [8] publishes a set of eleven Standards, each of which has sub-sections. The eleven Standards are 1. Institutional Mission and Purposes, 2. Planning and Evaluation activities, 3. Institutional Organization and Governance, 4. Academic Programs and Instruction, 5. Faculty, 6. Student Services, 7. Library and Information Services, 8. Physical Plant Resources, 9. Financial Resources, 10. Public Disclosure (accurate advertising of programs), and 11. Institutional Integrity (ethics). As the list indicates, the evaluation includes most all areas of an academy and sub-sections of the standards include substance and quality measures as well as process measures. As part of any accreditation the academies are required to prepare a comprehensive institutional self-study that addresses the eleven standards. Such a self-study usually takes one to two full years to complete and is then sent to the accrediting agency for their review.

After evaluating the self-study the agency will send a visitation team of eight to ten persons who visits the academy for three or four days to explore the eleven Standards in fuller detail. After the visitation team studies the academy a report is sent to the academy detailing findings of institutional strengths and/or concerns. The academy is given some time in which to respond to any errors in the report or correct weaknesses identified by the team. After that time NEASC will meet and determine whether accreditation is to be offered, delayed until certain corrections are made, or not awarded. As mentioned above, the consequences of not receiving accreditation are very significant and may even result in persons losing their positions or even cause the closing of an institution. Regional accreditation visits are normally scheduled every five or ten years. The institutional cost of an accreditation is usually in excess of $45,000USD.

ACCREDITATION IN DISCIPLINES

In addition to regional *institutional* accreditation, a number of specific disciplines or majors have accrediting associations. At the maritime academies, marine engineering and international business/intermodal transportation majors have associations that can accredit those specific programs.

ENGINEERING. For engineers, the Accreditation Board for Engineering and Technology (ABET) evaluates programs in

marine engineering at two levels. The Engineering Accreditation Commission (EAC of ABET) evaluates engineering programs in which design and mathematical analysis (at least calculus based) and upper levels of engineering science are involved. The Technology Accreditation Commission (TAC of ABET) evaluates marine engineering programs that uses calculus for analysis, but have limited design components in the curriculum and do not require upper level engineering science courses.

These two branches of ABET make a strong distinction between engineering and engineering technology, and within the United States, claim that only graduates of EAC of ABET programs can formally call themselves "engineers". Graduates of TAC of ABET accredited programs may only call themselves "technicians". Most shore-side companies and governmental agencies require engineering persons to have a degree from an ABET accredited program. In addition, many businesses and governmental agencies also closely adhere to the ABET definitions of "engineer" or "technician". Accordingly, in most places, only EAC of ABET accredited program graduates are allowed to be formally hired as "engineers" when employed ashore. Others can only be "technicians" thus earning lower salaries. Accordingly, such accreditation can be translated to increased earning power of graduates who wish to work in the maritime industry ashore.

More importantly, ABET accreditation is viewed as an indication of quality. Such a reputation is due to the rigorous program standards or criteria, and the demanding scrutiny of fellow engineers when they come to evaluate the program. Both EAC and TAC of ABET require that an engineering program self-study (similar to that of the regional institutional accrediting agencies) be done at the institution. Such a study must addresses all the published ABET program criteria [9, 10]. Such criteria cover areas from the required credentials of the faculty, the demonstrated existence of specific student analysis and/or design skills, student communication skills, ethical training, program lab equipment, the professional development activity of faculty, the appropriateness of faculty salary levels, clerical support for the program, the employment history of graduates, satisfaction surveys from employers of graduates to name just a few. After reading the self-study a three or four person team of engineers assigned by ABET from other institutions will visit the academies and explore areas they perceive were weak in the self-study. The visit usually lasts about three days.

If weaknesses or concerns were discovered the institution must correct them within a certain time or risk losing accreditation. Accreditation visits are scheduled every three to six years for ABET programs. The usual cost of an ABET accreditation is around $10,000USD per program with an annual membership fee of $1,200USD per program.

BUSINESS OR MANAGEMENT. The best programs in business and management in the United States are accredited by AACSB, The International Association for Management Education. Similar to NEASC and ABET, this organization establishes a set of quality criteria that must be met by member institutions. AACSB criteria [11] covers most areas of a program including the credentials of faculty, areas of study required for a degree, resources available for faculty development, resources available for the acquisition and maintenance of facilities, and entry standards for students. Those criteria also prescribe areas of study required beyond the specific business topics. For example, "ethical and global issues", "demographic diversity", and the "influence" of social, political, and environmental differences in people are required parts of an AACSB program.

This accreditation process includes a five-year candidacy term before accreditation would be considered. There is an annual fee

of $1300USD during candidacy that does not include travel costs for faculty and AACSB officials to attend a number of pre-accreditation meetings and visitations. Total costs for initial accreditation usually exceeds $20,000USD. Subsequent accreditation costs are in the range of $11,000USD, and reaccredidation visits usually occur every five years.

OVERALL ACCREDITATION COSTS

Accreditation costs include annual fees to the organization, costs of providing all transportation, housing, food, and administrative support for visiting teams, and institutional costs of faculty and staff who must dedicate time to preparing reports, etc. for accreditation. Annualizing costs for these three accreditations results in an annual cost of institutional accreditation of approximately $18,000USD.

However, these calculations do not take into consideration the funds needed to maintain the standards required of the various organizations. Depending on the association, these costs can be considerable and range as high as $150,000USD per year. These represent costs that the institution would not normally incur except to maintain a specific accreditation. That is to say, a degree and license program could still be offered, but at a lower degree of quality and at the cost of loss of prestige, funding, quality faculty and quality students. Accordingly, these costs are usually inevitable for maintaining a quality program that can compete as a higher level maritime academy in the United States.

4. USCG MINIMUM ASSESSMENT CRITERIA

Between the initial notification of STCW 95 compliance by the USCG at the 1996 meeting in California and their 1999 significant impact statement, many meetings between the USCG and the maritime academies occurred. One of the most significant occurred at MARAD in Washington, DC in April of 1998. At this meeting the USCG reaffirmed that it was their intent to require the standardization of minimum assessment criteria for meeting STCW95 competencies that every academy would have to adopt. That is to say that the USCG would determine exactly what was needed to successfully accomplish each competency and each academy had to accept that as a national minimum standard. In effect, individual instructors and examiners would be required to construct curricula that included these specific criteria levels or better before any U.S. training program would be approved as meeting STCW 95 standards.

For example, to find a position using heavenly bodies the USCG would detail methods to be used, minimal accuracy accepted, what steps had to be recorded as observed, and under what conditions done. An individual competent instructor or examiner would have little leeway for professional judgement.

As another example, initial trials of minimum assessment criteria developed by a research firm hired by the USCG (Battelle Center) for the "preparation of main machinery for operation" included 28 recorded observations [12]. Carrying out this level of detail for the entire competency of starting the main engine would result in enormous paperwork and a prohibitive per student assessment time.

Developing national standards for such a wide range of training included in STCW 95 is a large and politically complex task. For example, in another initial standardization attempt the USCG proposed the adoption of a set of minimum standards for basic safety training [13] that was developed for them by a union maritime training center. The water survival standards were tailored to be used in the centers' small swimming pool and low

diving platform so that the center could continue to train mariners. Accordingly, the standard for jumping from a height was set by the USCG as "not to exceed one meter". The net result was to render unacceptable all the academy safety programs that more realistically simulated a real vessel height, as they all were more than one meter high.

As the effort to create minimal national standards progressed it became obvious that the task was more difficult than anticipated. Although professional mariners from throughout the nation have met and developed sets of minimum assessment criteria for the USCG, as of this writing the USCG has yet to publish any official version. As the academy students who graduate in 2002 must meet STCW 95 standards and as most academy programs are four years in length, this means that hundreds of academy students have started their training without knowing what the USCG minimal training standards may be. It would be very difficult and expensive to have to go back and apply new criteria to years of past training.

The effort to establish national minimal assessment standards of this detail and in this manner have also threatened to take away from each academy a fundamental right of American higher education. That is the instructor's right to establish a training program that meets STCW95 criteria according to his or her professional judgement as a teacher and mariner. This right is demanded by the criteria [14] of our accrediting agencies as integral to the quality of an institution and is evaluated by each visiting team. Accordingly, the establishment of rigid national performance and assessment criteria could threaten the ability of an academy to be accredited.

Finally, when queried by MARAD [15], the federal and state academies have indicated that compliance with STCW95 has already cost them an average of $90,000USD per year in addition to their previous cost of operation

SUMMARY

In conclusion, past maritime academy STCW95 compliance efforts by the USCG has ignored the need for academies to educate as well as train from both a regulatory and accreditation perspective. In addition, it has more than doubled the cost of complying with outside regulatory agencies.

The failure to attempt to reconcile education with training, however, is the greatest problem. The USCG view that STCW95 compliance is a pure training issue which has little to do with being an educated person can result in a failure to accomplish the missions of the academies and threatens them with a loss of critical accreditation. Loss of accreditation threatens the quality of education of students and their ability to find competitive employment. More importantly, failing to educate in the manner proscribed by the U.S. Congress or in accordance with accepted degree accreditation standards means that new mariners may not have all the intellectual, ethical, and social skills of judgement needed to provide as safe and responsible ship operation as should be desirable in our world.

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