



U.S. House of Representatives
Committee on Transportation and Infrastructure

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SUMMARY OF SUBJECT MATTER

TO: Members of the Committee on Transportation and Infrastructure
FROM: Subcommittee on Coast Guard and Maritime Transportation
SUBJECT: Hearing on Mariner Education and Workforce

PURPOSE OF HEARING

The Subcommittee on Coast Guard and Maritime Transportation will meet on Wednesday, October 17, at 10:00 a.m., to receive testimony on trends and innovations in mariner education and to assess how growing workforce shortages will affect the maritime industry as trade continues to increase. Specifically, the hearing will consider the possible impact of various factors on workforce shortage, including wage levels; lifestyle challenges associated with employment in the maritime industry; and training requirements imposed by the Standards of Training, Certification, and Watchkeeping ("STCW") Convention.

BACKGROUND

The U.S. maritime transportation industry serves the needs of both domestic and foreign commerce. It is comprised of companies that carry passengers or freight on the inland waterways or open seas and operate canals, terminals, charter vessels, and towing services.

According to the U.S. Department of Commerce, the movement of goods in the U.S. maritime sector accounts for some \$750 billion of the U.S. Gross Domestic Product – in large part because our ports are the gateways through which 80 percent of our nation's foreign trade by volume enters the country.

U.S. waterborne trade, which grew by 8.5 percent between 2001 and 2005, totaled 2.3 billion metric tons in 2005. Foreign commerce totaled more than 1.3 billion metric tons, accounting for 59 percent of the total amount of waterborne commerce in the United States.

Among all foreign commerce entering the U.S., the trade in containers has experienced a staggering 52 percent increase over the past five years. However, growth in the container trade has been tightly concentrated, with the top ten U.S. ports accounting for more than 90 percent of the total U.S. international container trade in 2006.¹

On average, the total value of goods (both imports and exports) passing through U.S. ports on a daily basis totals \$1.3 billion – and each of the 50 States relies on commerce flowing through 13 to 15 ports. It is estimated that by 2020, the nation's cargo volumes will double and passenger counts on cruise ships are also expected to double.

Unfortunately, while waterborne commerce in the United States continues to expand, the U.S. faces a growing labor shortage in the maritime industry, which threatens to leave the U.S. without the labor we need to meet the demands that continued growth in the maritime industry is expected to create.

There are currently estimated to be more than 160,000 water transportation and port service workers in the U.S. Since 2001, approximately 15,500 jobs have been added to these industries.

At the end of 2006, 40,000 vessels privately owned by U.S. entities – but not necessarily registered in the U.S. – were in operation. The vast majority of these vessels (approximately 38,800) were vessels intended for use on inland U.S. waterways and along the U.S. coasts; 680 of the vessels were ocean-going (tankers, dry bulk, container ships etc.), while 629 vessels were offshore supply vessels that brought goods to offshore oil exploration platforms. The number of offshore supply vessels grew over 35 percent, from 465 in 2001 to 629 in 2006. Double hull tankers increased 54 percent from 131 in 2001 to 202 in 2006 and double hull tank barges increased 25 percent, from 2,717 in 2001 to 3,403 in 2006.

One area of significant growth in the maritime industry involves the transportation of liquefied natural gas (“LNG”). Over the last five years, the number of LNG carriers calling on U.S. ports has increased by 115 percent. Based on current estimates of the number of new LNG tankers being built, the incremental crewing needs for these vessels has been estimated to require the entry of 9,000 mariners into this field.

Significantly, the Coast Guard and Maritime Transportation Act of 2006 amended the Deepwater Port Act to promote the use of U.S. personnel and U.S.-flagged vessels in the LNG industry. The Act gives priority status to the processing of license applications for offshore LNG terminals if the proposed facilities will be supplied with LNG carried by U.S.-flag vessels. In response to the incentives provided by the Act, several companies have made commitments that at least 25 percent of the crews on the foreign-flag LNG vessels serving their offshore terminals will be comprised of U.S. mariners (generally officers) by 2012. Recently, Woodside Petroleum, an Australian firm, has even agreed to flag the two LNG re-gasification vessels it plans to use to serve the proposed Ocean Way off-shore LNG project with the U.S. flag and to crew the vessels with U.S. crews.

¹ Maritime Administration, U.S. Water Transportation Statistical Snapshot

STANDARDS OF TRAINING, CERTIFICATION AND WATCHKEEPING FOR SEAFARERS (STCW)

The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers sets qualification standards for masters, officers and watch personnel on seagoing merchant ships. The STCW Convention was adopted at the International Maritime Organization in 1978; it entered into force in 1984. The Convention represented the first effort to prescribe certain minimum professional standards for seafarers that would be applicable throughout the maritime industry. Prior to the adoption of the STCW Convention, individual governments established their own standards of training, certification and watchkeeping for officers and ratings – usually without reference to practices in other countries, which resulted in wide variations in standards and procedures. By December 2000, the STCW Convention had 135 parties, representing more than 97.5 percent of world shipping tonnage.

From 1984 until 1995, the STCW Convention's requirements were generally concomitant with the mariner documentation and licensing requirements in force in the U.S. In 1995, however, following several major maritime accidents, including the grounding of the M/V AEGEAN SEA in December 1992 on rocks outside the Spanish port of La Coruna and the grounding of the M/V BRAER in the Shetland Islands two months later, the Convention was significantly amended.

Delegations working on amending the STCW Convention agreed to concentrate their amendments on areas relating to ship personnel training standards and operational practices instead of issues dealing with improving ship construction and equipment standards. Specifically, the goal of the STCW Convention revisions was to establish the highest practicable standards of competence to reduce the prevalence of human error as the major cause of maritime casualties.

The 1995 Amendments, which imposed significant new training and education requirements on mariners around the world, including in the United States, entered into force on February 1, 1997. Originally, all mariners had to be in compliance with the Amendments by February 1, 2002, but a one-year extension was later issued giving mariners until February 1, 2003, to comply. Mariners who held licenses on February 1, 1997, had the option of renewing their licenses in accordance with the old rules of the 1978 Convention until February 1, 2003. New mariners entering training programs after August 1, 1998, were required to meet the competency standards of the new 1995 Amendments.

In the U.S., mariners are subject to the amended STCW Convention requirements if they sail beyond the U.S. boundary line on commercial vessels (the boundary line separates the bays, harbors and other inland waters from the ocean) even if the vessel is not on a voyage to a foreign country. If mariners sail on vessels less than 200 gross tons on domestic voyages that begin and end in a U.S. port, they are exempt from the standards of the STCW Convention.

Human element issues addressed by the 1995 Amendments

A fundamental objective of the STCW Convention is to establish standards of competence for the performance of tasks associated with a mariner's work on a vessel and to allow assessment to be made of whether an individual meets specific competence requirements. The 1995 Amendments also establish minimum rest periods for watchkeeping personnel and requires that all mariners receive basic safety training and achieve a minimum level of familiarity with vessel operations.

A principle of the amended Convention is that proper training, combined with the use of proper procedures and the effective application of quality management principles, will promote safe shipboard practices and in turn prevent human error or allow the detection of errors at a point when adverse consequences can be avoided. This focus is intended to significantly reduce the number of instances in which human error leads to a pollution incident or maritime casualty.

The 1995 Amendments also sought to strengthen the port state control provisions of the Convention by expanding the reasons for which a foreign ship may be detained (e.g., prohibited from departing from a port until problems/deficiencies are corrected). It also allows port state control officers to conduct direct assessments of the competence of merchant mariners. This provision allows the U.S. Government to assess the competence of mariners on foreign-flag vessels that enter U.S. ports.

The Amendments also addressed the problem of crew fatigue by requiring each person assigned duty as an officer in charge of a watch or as a rating forming part of a watch to have 10 hours of rest in any 24-hour period. As long as one rest period is at least six hours long, the 10 hours of rest may be divided into two parts, with strictly limited exceptions.

The Amendments require that seafarers be provided with safety and familiarization training to ensure that they are aware of the hazards of working on a vessel and can respond appropriately in an emergency. The training must cover personal safety and social responsibility, basic fire fighting, elementary first aid, and personal survival techniques. Automatic Radar Plotting Aids and Global Maritime Distress Safety System are required training for deck officers serving on vessels equipped with those systems. If a vessel is not fitted with those systems, the license and STCW Convention endorsement would state the limitation.

The Amendments further require that the master and deck officers on a vessel have comprehensive knowledge of bridge teamwork procedures. In the U.S., this requirement is interpreted as meaning that personnel must have the ability to apply principles of bridge resource management.

The technical regulations of the STCW Convention were revised to specify minimum standards of competence for the range of certificates to be issued under the Convention. The standards are set forth in tables with four columns that record for each certificate holder: a) the "competence" or ability to be established; b) the area of "knowledge, understanding and proficiency" within each competence; c) the "methods of demonstrating competence", and d) the "criteria for evaluating competence". The Amendments recognize the use of simulators as an acceptable method for demonstrating competence.

The Amendments require all training and assessment activities to be continuously monitored through a quality standards system to ensure achievement of defined objectives. Standards were also promulgated concerning the qualifications and experience of instructors and assessors. Specifically, the Amendments require those responsible for providing instruction to seafarers and assessing their competence be qualified for the same type and level of training or assessment they are providing.

Finally, the Amendments include new regulations on the training and qualification of masters, officers, ratings and other personnel on roll-on/roll-off ("RO-RO") passenger vessels,

which include ferries and cruise ferries. In 1997, a subsequent set of STCW Convention amendments ("V/3") added similar regulations to cover personnel serving on passenger ships other than RO-RO passenger ships. Regulations are now being developed to incorporate the STCW V/3 regulation into the U.S. licensing system to meet the requirements of the 1997 Amendments. Importantly, the proposed rule would only apply to U.S. passenger ships on international voyages to which International Convention for the Safety of Life at Sea certificates are issued.

U.S. MARITIME ACADEMY

There are many educational facilities dedicated to the training of licensed mariners in the U.S. (mariners who possess licenses are considered to be officers), including a federal maritime academy and six state academies. The academies are a guaranteed source of merchant marine officers who can help meet domestic and international crewing needs, including the crewing needs of the U.S. reserve fleets, such as the Maritime Sealift Command and the U.S. Ready Reserve fleets.

Federal Maritime Academy

The U.S. Merchant Marine Academy ("USMMA") is located in King's Point, New York. In the past four years, King's Point has produced more than 800 Coast Guard-licensed officers.

The Federal Government pays for each midshipman's education, room and board, uniforms, and books. The midshipmen are responsible for the payment of fees for mandatory educational supplies not provided by the Government. For the 2006 graduating class, the four-year cost per student was \$185,400.

Students who wish to attend the USMMA must be nominated to the Academy by a U.S. Representative or Senator. Once enrolled, a student must complete the course of instruction at the Academy and then pass the Coast Guard examination for a license as an officer in the U.S. Merchant Marine. Graduates of the USMMA must maintain their Coast Guard license for at least six years from the date of graduation.

Upon graduation, students at the USMMA must apply for and accept, if offered, an appointment as a commissioned officer in an armed force reserve component. If appointed, students must serve in that reserve component for at least eight years from the date of their graduation.

Graduates of the USMMA are also required to serve in foreign and domestic commerce or in the national defense of the U.S. for at least five years from the date of graduation. To fulfill this requirement, students may work as merchant marine officers serving on vessels documented under the laws of the U.S. or on vessels owned and operated by the U.S. or by any state or territory of the U.S. Students may also fulfill their service requirement by serving as commissioned officers on active duty in an armed force of the U.S. or in the National Oceanic and Atmospheric Administration. Students may also work in a U.S. maritime-related industry, profession, or marine science as approved by the Secretary of Transportation if the Secretary determines that service as a merchant marine officer on a vessel under the laws of the U.S. or vessel owed by the U.S. is not available to the individual.

State Maritime Academies

The state maritime academies are the largest source of newly licensed officer for the U.S, providing 70 percent of new officers in 2006. In the past four years, the state maritime academies have produced more than 1,580 Coast Guard licensed officers. The academies are located in Massachusetts, New York, Great Lakes (Michigan), Maine, California and Texas.

Pursuant to the Maritime Education and Training Act of 1980, the United States Maritime Administration ("MARAD") provides financial assistance to all state maritime academies to support the training of merchant marine officers.

Cadets who participate in the Student Incentive Payment ("SIP") Program receive a maximum of \$4,000 annually to offset school costs. SIP participants are required to complete the academy's course of instruction and pass the Coast Guard examination for a license as an officer in the U.S. Merchant Marine. SIP participants are then required to maintain their Coast Guard license for at least six years from the date of graduation.

Upon graduation, SIP participants must apply for and accept, if offered, an appointment as a commissioned officer in an armed force reserve component and serve for at least six years from the date of graduation. They must also maintain employment in the maritime industry for at least three years from the date of graduation.

TRAINING FOR UNLICENSED CREW MEMBERS

Entry Level

Unlicensed mariners can enter the field through apprenticeship programs and on-the-job training provided by individual companies. The towing, fishing, and marina industries and Northrop Grumman offer these types of programs.

The Seafarer's International Union ("SIU") also offers entry level, apprenticeship training for unlicensed personnel at its training center in Maryland, which is the largest apprenticeship program of its kind. The program is nine months in duration and provides employment opportunities for approximately 600 unlicensed apprentice mariners per year. Since inception in 1967, the school has trained more than 22,000 graduates.

Marine and Maritime Themed Schools

Currently, there are 16 marine and maritime-themed elementary, middle, and high schools in the U.S. The average size of a school is approximately 350 students. These schools typically expand the focus of regular school curriculums by including various types of maritime and/or marine training. Marine schools offer programs that integrate biology, oceanography, and marine sciences. Maritime schools provide students with the knowledge of the maritime industry and its careers. Depending on the school, graduates of maritime-themed high schools typically receive their high school diploma and may also leave the school with certifications and most of the sea service required for the position of Able Seaman or Qualified Member of the Engine Department.

Upgrade Training

In the U.S., there are 250 training providers available for licensed and unlicensed personnel and those seeking to upgrade their documents. A large number of the training providers are commercial and non-profit training facilities. State academies and maritime unions also operate training facilities that provide continuing education and upgrading courses.

MARINER STATISTICS

According to the U.S. Coast Guard, there are more than 130,000 unlicensed mariners with Merchant Mariner Documents and more than 212,500 licensed mariners. There are over 670 mariners with Certificates of Registry, which includes medical personnel, doctors, radio operators, etc. Of the more than 343,000 licensed and unlicensed mariners, over 76,700 have STCW Convention Endorsements.

The average age of a merchant mariner with a Master's license is 51, while the average age of a Chief Mate is 46. The average age of a Chief Engineer is 50, while the average age for a First Assistant Engineer is 46. The average age of an inland captain and pilot is 49. More than 28 percent of inland pilots and captains are over 55 and will be eligible to retire in the next seven years.

POSSIBLE REASONS FOR MARINER SHORTAGES

Training

The 1995 Amendments greatly affected mariners, including U.S. mariners, by creating unfunded training and certification mandates for unlicensed mariners who traditionally progressed to licensed officer positions through on-the-job training at minimal cost. Specifically, the 1995 Amendments made it very expensive for unlicensed mariners to advance up the career ladder – commonly called “climbing the hawsepole” – by requiring mariners to pass a new and complicated set of exams to earn or renew licenses. These new standards have raised the bar for new workers seeking to advance in a maritime career and have even pushed some older workers into early retirement.

Lower level mariners have traditionally been responsible for financing their own professional training. The cost of obtaining a Master's or Mate's license to operate vessels rarely exceeded \$1,000 at a private or vocational school. With the increased training requirements, however, specialized training and certifications can now cost up to \$26,000 and employers have traditionally provided little or no funding to cover the costs of such training. For smaller vessels, STCW Convention training can cost \$650 for a deckhand and between \$2,000 to \$10,000 for a captain. There is now growing concern in industry that the cost and complexity of meeting STCW Convention requirements for license renewals and/or upgrades is reducing the pool of potential seafarers.

When the 1995 Amendments went into effect, the U.S. Department of Labor provided the Gulf Coast Mariners Association with a one-time \$4 million grant to help pay for increased training. Since the 1995 Amendments, there has not been a single, effective, coordinated program established to provide a trained pool of lower-level mariners to operate towboats, tugboats, charter fishing vessels, offshore supply vessels, ferries, and other small passenger vessels.

There is also a lack of information available to potential mariners to help them understand either how to enter the industry or to progress along a career path. The lack of recruiting and entry information coupled with the lack of information on, and even opportunities for, upward mobility may deter new recruits from entering the maritime field and may shorten careers for existing mariners.

Criminal Liability

Mariners feel that criminal liability for pollution incidents has also become an important barrier to recruitment and retention in the maritime field. Under the Oil Pollution Act of 1990 ("OPA '90") (33 U.S.C. 2701), the Refuse Act (33 U.S.C. 407), and the Migratory Bird Treaty Act (16 U.S.C. 703), mariners are exposed to criminal prosecution for a variety of legal violations. The Refuse Act and Migratory Bird Act, for example, are "strict liability" statutes that allow prosecution and conviction even when negligence or intent on the part of the individuals involved is not proven. OPA '90 has a slightly higher threshold of "simple negligence" (the failure to exercise ordinary care; to be distinguished from gross negligence) that allows mariners to be prosecuted and convicted for what some mariners feel are honest mistakes. State legislation can also make mariners liable for multiple lawsuits and can even expose them to additional prosecution for an accident also prosecuted at the federal level.

Further, under the Seaman's Manslaughter Statute (18 U.S.C. 1115), a mariner can be charged with felony manslaughter if the prosecution proves only simple negligence and the maximum punishment for offenses can be as high as 10 years in prison. Over the past several years, the statute has been used to convict crewmembers of vessels and shoreside personnel involved with vessel operations. Generally, in other industries, gross negligence must be proven in cases of alleged manslaughter.

Wages

Mariners feel their wages have not kept pace with opportunities ashore, which has also had an impact on recruiting and retention. Some maritime positions earn less today than they did 20 years ago.

The average starting salary for a 2006 graduate of State University of New York Maritime Academy was more than \$57,000. The salary range for an Able Seaman with Military Sealift Command ("MSC") is \$39,274 plus overtime. A Deck Engineer with MSC makes \$32,562 to \$37,620 plus overtime.² With a commercial company, a Third Mate's salary starts at \$66,000.³ Captains of large container ships, passenger ships, or oil tankers can earn more than \$100,000 per year.

Entry-level Ship and Boat Captains earn \$36,920 (\$17.75 hourly), while experienced Ship Boat Captains earn \$64,860 (\$31.18 hourly). With a high school diploma, entry-level Ordinary Seaman earn \$21,780 (\$10.47 hourly), while experienced seaman earn \$37,660 (\$18.11 hourly). Entry-level Mates on ships, boats, and barges earn \$36,920 (\$17.75 hourly) while experienced mates

² Website: <http://www.msc.navy.mil/apmc/opening.asp>

³ Website: <http://www.kirbycorpjobs.com/en/cms/?24>

earn \$64,860 (\$31.18 hourly). Entry-level Ship Engineers earn \$41,200 (\$19.81 hourly) while experience engineers earn \$71,600 (\$34.42 hourly).⁴

U.S.-flag commercial vessels in U.S. foreign trade and their U.S. citizen merchant mariners have competitive pressures from foreign-flag vessels and foreign crews that pay little or no taxes to their respective governments.

Many foreign nations exempt their mariners from income tax. An income tax exemption is not available to American merchant mariners, which makes it more expensive for U.S.-flag vessel operators, and harder for American mariners to get employment on U.S.-owned U.S.-flag and foreign-flag commercial vessels.

Manning

Over the years, technology has advanced, replacing seafarers and reducing manning levels. With reduced manning levels, the workload of ship's officers, including senior officers, has increased. Mariners typically have limited opportunities or conditions conducive to study aboard a vessel. Some lower level mariners feel that the pressure to reduce crew sizes has led to work hour abuses.

Lifestyle

A mariner's lifestyle is characterized by significant time away from his or her home and family. Living onboard a vessel involves close accommodations, reduced socialization, and little opportunity for shore leave. The three main psychological problems among seafarers have been identified as loneliness, homesickness, and burn out. They are caused by long periods away from home, the reduced number of seafarers per ship, and increased automation.

Factors that affect shipboard life are the adequacy of shore-side support, mental and emotional stress, and delays in the marine licensing and documentation system. Other factors include health-related physical factors (noise, light, safety, vibration, habitability); work factors (physically and mentally demanding, scheduling, fitness for duty, increased workload); mental/emotional factors (stress, image); customer/regulatory inspection factors (unreasonable requests, lack of respect for the mariner, scheduling, sleep/rest cycles while in port); health factors; entertainment factors; communication factors (telephone, e-mail access to families and social network); social factors (small crew size, camaraderie, language); and vessel support factors (maintenance, technical support, fleet age, updates).

⁴ Website: <http://www.oceancareers.com>

WITNESSES

Panel I

Rear Admiral Joel Whitehead
U.S. Coast Guard

Mr. Sean Connaughton
Administrator
MARAD

Panel II

Mr. Michael Rodriguez
Executive Assistant to the President
Master's Mates and Pilots

Mr. Carl Annessa
COO/Vice President for Operations
Hornbeck Offshore Services
For
Offshore Marine Service Association

Ms. Cathy Hammond
CEO, Inland Marine Service
for
American Waterway Operators

Admiral John Craine, Jr. USN (Ret)
President
S.U.N.Y. Maritime College

Captain William Beacom
Navigation Consultant, Professional Mariner

Mr. Augustin Tellez
Executive Vice President
Seafarers International Union

Panel III

Captain Arthur H. Sulzer, USN (Ret)
Board Member
Maritime Academy Charter High School

Captain Jeff Slesinger
Director-Safety & Training
Western Towboat Company

Ms. Berit Ericksson
Former Executive Director
Pacific Coast Maritime Consortium