Opportunities and Challenges to Increasing the Number of United States Coast Guard Credentialed Mariners

Report to Congress

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Maritime Administration

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Abbreviations

CIVMAR	Civilian mariner employed directly by the Military Sealift Command as a Federal employee
CONMAR	Private sector U.S. citizen mariner working onboard an RRF or MSC ship under contract through a commercial ship operating company
DoD	United States Department of Defense
DOT	United States Department of Transportation
FOS	Full Operating Status (pertains to RRF and other U.S. Government surge sealift vessels)
GAO	Government Accountability Office
MARAD	Maritime Administration
MMLD	Merchant Mariner Licensing and Documentation System
MOS	Mariner Outreach System
MSC	Military Sealift Command
MWWG	Maritime Workforce Working Group
NSMV	National Security Multi-Mission Vessel
ROS	Reduced Operating Status (pertains to RRF and other U.S. Government surge sealift vessels)
RRF	Ready Reserve Force
SIP	Student Incentive Payment
SMA	State Maritime Academy
SSOP	United States Navy Strategic Sealift Officer Program (also referred to as the SSO Program)
STCW	International Convention on the Standards of Training, Certification and Watchkeeping for Seafarers
TWIC	Transportation Worker Identification Credential
USCG	United States Coast Guard
USMMA	United States Merchant Marine Academy
USTRANSCOM	United States Transportation Command

EXECUTIVE SUMMARY

This Report to Congress is submitted pursuant to the House of Representatives Committee on Appropriations Report 114-606, that accompanied the Departments of Transportation and Housing and Urban Development, and Related Agencies Appropriations Bill, 2017 (H.R. 5394). House Report 114-606 called on the Maritime Administration (MARAD), which is an agency of the U.S. Department of Transportation (DOT), to report on opportunities and challenges to increasing the number of U.S. Coast Guard (USCG) credentialed officers. House Report 114-606 further encouraged MARAD to consider the costs and benefits associated with increasing the number of State maritime schools, and to identify coastal States and localities that could support new schools.

Please note that none of the potential actions discussed in this report should be construed as recommendations or as establishing either policy or commitments on behalf of the United States Department of Transportation or the Administration.

House Report 114-606 cites the importance to maritime security of "U.S. mariners available for contingency operations." MARAD notes that the Nation needs highly-skilled U.S. mariners of all types, officers and non-officers, particularly those who 1) hold USCG Merchant Mariner Credentials with endorsements to operate vessels without limits on vessel size, horsepower, or geographic location (referred to as credentials with "unlimited oceans" endorsements); and 2) who meet other qualifications, including (but not limited to) possession of current medical certificates and Transportation Worker Identification Credentials, and current requirements of the International Convention on the Standards of Training, Certification and Watchkeeping for Seafarers (STCW). The Maritime Workforce Working Group (MWWG), established pursuant to Section 3517 of the National Defense Authorization Act of 2017, concluded that these qualifications are most likely to be met by mariners with recent sea service.[1] These mariners, many of whom are actively employed on the existing U.S.-flag fleet of large, self-propelled, oceangoing merchant-type ships, have the full set of qualifications required to crew U.S. sealift assets during times of national emergency. Accordingly, they are referred to in this report as "sealift-qualified" mariners and include both officers (referred to as "licensed" mariners) and non-officer mariners (referred to as "unlicensed" mariners or "ratings").

The availability of sealift-qualified mariners is difficult to quantify with current data collection methods, particularly at the required level of specific credentials, certifications, and recent sea service. Until the additional research recommended by the MWWG is completed, and until the Government can reliably identify the number of qualified mariners that will report for a sealift mission during a national

[1] Section 3517 of the National Defense Authorization Act of 2017, which directed the establishment of the Maritime Workforce Working Group (MWWG) to assess mariner availability (see footnote 4), specified that having sailed within the prior 18 months constituted recent sea service for a mariner, but other thresholds for recency (e.g., sailing within the prior 24 months) have been used in the past. Members of the MWWG concurred that mariners sailing within the last 18 months are more likely to be actively sailing with up-to-date endorsements and training (see pp. 3 and 23 of the Maritime Workforce Working Group Report (MWWG Report, January 23, 2018). If needed during a sealift contingency, DOD could accept mariners who are otherwise qualified but had not sailed on large vessels within an 18-month window. However, from the standpoint of having a well-prepared mariner labor force that can be activated for sealift on very short notice, the pool of active or recently active mariners measured in the MWWG Report presents the estimate of U.S. mariner readiness using the MWWG selected methodology until better estimation methods can be implemented.

emergency (participation is voluntary for the majority of mariners), there will be uncertainty regarding whether there is a sufficient number of sealift-qualified merchant mariners to fully meet concurrent deployment of all DoD sealift ships and all U.S. commercial ships during a national emergency.

To ensure sufficient availability of sealift-qualified mariners to meet DoD's sealift needs, the U.S. Government needs to better identify and retain sealift-qualified mariners that will participate in sealift services during times of national emergency. The following actions to support these objectives were identified by the MWWG or by other industry stakeholders and may be considered as possible means to accomplish these objectives. However, these potential actions need to be analyzed further to determine their potential efficacy:

- Support a healthy commercial U.S. Merchant Marine. Ultimately, the success of mariner recruitment and retention programs depends on a healthy, competitive commercial U.S. Merchant Marine industry operating modern vessels and serving international and domestic maritime markets. MARAD and other agencies should efficiently administer U.S. Government programs that further develop global market demand for U.S.-flag shipping and facilitate competition that will support growing demand and sustainable jobs for U.S. mariners.

- Fully crew the U.S. Government surge sealift fleet on a permanent basis. To reduce costs but maintain readiness, the surge sealift fleet is maintained in a Reduced Operating Status (ROS) with a small compliment of private-sector mariners (provided under a contract through a commercial ship operating company), known collectively as contract mariners (CONMARs). CONMARS are drawn from the same pool of mariners that work on commercial oceangoing ships. As a vessel is being activated, additional private sector mariners are brought on board so that the vessel is fully crewed. At significant additional expense, the vessels could be kept fully crewed on a permanent basis even when inactive. In this fully-crewed scenario, consideration could also be given to the use of civil service mariners (Federal employees referred to as CIVMARs) in place of CONMARs, in which the CIVMARs would be rotated periodically to U.S. Government vessels that are actively sailing to maintain proficiency. There are various practical problems, in addition to cost, with a fully-crewed scenario, however, and support for a healthy commercial merchant fleet would remain essential.

- Repair or replace the United States Coast Guard's Merchant Mariner Licensing and Documentation System (MMLD). The MMLD was not designed to support the Nation's need for information on the numbers and availability of sealift-qualified mariners. Rather, it was designed to issue and record various types of maritime credentials and endorsements earned by individual mariners who have completed necessary requirements. The MMLD is not easily searchable for total numbers of mariners with specific types of endorsements and has limited information on recency or type of sea service for many mariners. USCG and MARAD recognize that a redesigned database could greatly enhance the value of USCG data for documenting the size and qualifications of the Nation's mariner base. Near-term, pending potential development of a redesigned database, DOT/MARAD and USCG are continuing to pursue reasonable actions to improve the utility of the MMLD and its interface to the MARAD's Mariner Outreach System (MOS) to identify sealift-qualified mariners.

- Conduct a biennial Mariner Survey. In the near term, MARAD is well underway with an effort to re-establish and improve a biennial survey of mariners to capture information on mariners' availability and willingness to respond in sealift activation; employment patterns; progress in meeting certification standards; and other factors relevant to current mariner qualifications that would greatly improve the utility of the Nation's mariner data. MARAD is currently seeking OMB approval to initiate the survey and have results in 2021.

- Expand the reserve Strategic Sealift Officer Program (SSOP). The Navy's Reserve SSOP consists of qualified, licensed mariners who could be activated if sufficient mariners did not volunteer. The program, which currently maintains approximately 2,000 licensed officers (many among whom are already included in the subset of actively sailing sealift qualified mariners) in various communities of Navy Reserve billets, could be expanded by increasing the number of sealift-qualified officers. The U.S. Government could consider establishing an SSOP-like program for unlicensed mariners.

- Establish a purely civilian mariner reserve program. MARAD could continue to explore the development of a civilian mariner reserve program to ensure that there are enough sealift-qualified mariners with experience in all key categories (e.g., engineering officers with steam engine endorsements) to sail when a national emergency arises. The program could assist in arranging specialized training, credential renewal, and sea time opportunities. As part of this effort, MARAD could consider the efficacy of providing limited financial assistance to mariners participating in the reserve program. This assistance could pay for training and maintaining credentials, and in return for receiving it, mariners would accept the binding obligation to sail in the event of a contingency. Such an option needs to be further developed to determine potential implementation issues. Unlike the SSO program, officers who are not part of the Navy Reserve, and all unlicensed mariners, would be eligible to participate in this program.

- Publicize clear and unambiguous guarantees of reemployment rights for mariners who volunteer to sail during surge sealift conditions. MARAD recently posted enhanced guidance on reemployment rights under current law.[2] MARAD could also explore, in conjunction with congressional stakeholders, possible legislative changes that would expand such rights to apply to all U.S. mariner service during a national emergency if such service is specifically for or requested by the U.S. Government, even on vessels that are not owned, requisitioned, chartered, or controlled by the U.S. Government.

- Expand Student Incentive Payment (SIP) Program. MARAD could explore an increase in SIP funding to State Maritime Academies' (SMA) students and advertise the program more widely to increase

[2] Link to the Maritime Administration's Re-Employment Program webpage https://www.maritime.dot.gov/outreach/re-employment-rights

the number of mariners graduating with a service obligation. MARAD notes that this expansion of SIP would require further engagement with key stakeholders as well as new legislative authorities.

- Expand the Obligations for Recipients of the SIP Program and USMMA Students. All graduates of the USMMA and those graduates of the SMAs who receive SIP also incur obligations to work in the maritime industry, maintain their credentials for six years, and be active in a U.S. Armed Forces reserve unit (if accepted into one), or enter active duty military service. Expanding the lengths of these requirements for new graduates could expand the pool of available mariners in future years, but would require statutory changes (current requirements reflect the maximum allowed by statute). Extension of requirements, particularly for SMA students, could discourage participation in the SIP program.

- Identify mariners whose credentials could be reactivated or upgraded quickly and create programs and incentives to access these mariners for sustainment sealift operations. This identification could be done through enhancement of the MMLD, MOS, through a biennial mariner survey, and/or as a feature of a civilian mariner reserve program. MARAD is currently undertaking these efforts in conjunction with USCG.

- Upgrading mariner credentials. Another potential source of mariners are active sealift-qualified mariners whose credentials could be upgraded through training to higher categories (e.g., from Third Mate to Second Mate) where shortages in the higher categories may exist. Similarly, some active mariners who are currently not sealift-qualified could be encouraged to upgrade their credentials to hold unlimited oceans endorsements through training programs that provide sea service on large oceangoing vessels.

- Work with U.S. Coast Guard and the Department of Defense to identify potential training programs to obtain Merchant Mariner Credentials for both active and retired military personnel. DOT/MARAD will continue to collaborate with the Committee on the Marine Transportation System (CMTS), DoD, USCG, other Federal agencies, and industry to support Military-to-Mariner credentialing program that helps eligible veterans who are interested in transferring the skills they learned in the Armed Forces into civilian careers within the maritime industry (this program is distinct and separate from the reserve programs of the U.S. Armed Forces).[3]

- Support existing educational institutions. MARAD could augment its support for SMAs, technical and community colleges, high schools, union-operated training centers, and private academies that specialize in educating and training Americans for careers in the maritime industry. As one means to

[3] On March 4, 2019, President Trump signed an Executive Order to facilitate the transition of military services members into the civilian merchant marine. The order directs the USCG to waive certain requirements for applicants who have had comparable training while serving in the military. https://www.whitehouse.gov/presidential-actions/executive-order-supporting-transition-active-duty-service-members-military-veterans-merchant-marine/

do this, the National Defense Authorization Act for Fiscal Year 2018 authorized the Secretary of Transportation to designate certain covered institutions (e.g., community colleges) as "centers of excellence for domestic maritime workforce training and education."

- Explore the establishment of one or more new SMAs. MARAD could work with States to identify where one or more new SMAs could be located, and identify appropriate assistance for it, with initial focus on the Southeastern United States, and possibly the Pacific Northwest— regions which currently do not have an SMA and have diverse populations.

- Provide modern training ships to the SMAs. The ability to train new generations of licensed and unlicensed mariners is dependent on the availability of modern training platforms. Since the MWWG issued its report in January 2018, the Consolidated Appropriations Act of 2018 has provided $300 million to MARAD to implement the National Security Multi-Mission Vessel (NSMV) program and construct a new training ship which will replace an obsolete training ship at an existing SMA. Also, the Fiscal Year 2019 Omnibus appropriation provided an additional $300 million for construction of an additional training ship.

INTRODUCTION

House of Representatives Report 114–606 on the TRANSPORTATION, HOUSING AND URBAN DEVELOPMENT, AND RELATED AGENCIES APPROPRIATIONS Act, 2017 states as follows:

> "Mariner numbers. — The success of the maritime security program relies not only on the availability of U.S.-flagged ships, but U.S. mariners available for contingency operations. Current trends indicate that the number of credentialed and active mariners continues to drop despite high graduation rates at the existing six state schools and the USMMA. The Committee directs MARAD to report by February 6, 2017 on opportunities and challenges to increasing the number of U.S. Coast Guard credentialed officers. Further, the Committee encourages MARAD to consider the costs and benefits associated with increasing the number of state schools, and identify coastal states and localities that could support a new school. Consideration should be given to states that currently do not have a maritime or other national service academy, and areas with a diverse population" (p. 58 of H. Rept. 114-606).

Sealift is the large-scale transportation of troops, supplies, and equipment by sea. In this study, the contingency situation is assumed to require the full mobilization of all 63 U.S.-Government surge sealift vessels with crews sufficient to ensure navigation safety,[4] as well as the continued operation of all U.S. Government non-reserve ships and the concurrent employment of privately-owned U.S.-flag commercial ships at peacetime levels, for a period lasting more than six months. This mobilization would support military surge and sustainment, and to the extent possible after meeting military requirements, civilian and economic needs (including the needs of defense industries during the emergency). Mobilization is assumed to consist of two principal phases—a "surge" phase when U.S. Government and available commercial vessels predominantly support deployment of military units and a "sustainment" phase when vessels predominantly support the transportation of large quantities of resupply and ammunition to these units.[5]

While House Report 114-606 cites the need for credentialed officers, MARAD expanded the scope of this study to address both officers ("licensed mariners") and non-officers ("unlicensed mariners" or "ratings") who meet these qualifications, collectively referring to them as "sealift-qualified" mariners (defined in more detail below). Vessels require both officers and non-officers to operate safely and effectively.

MARAD deferred the completion of this report so that it could be informed by the findings of another study that addressed the issue of mariner availability. Specifically, Section 3517 of the National Defense

[4] The surge sealift vessels, when activated, are crewed to the minimum USCG Certificate of Inspection level for routine service, commonly known under the Safety of Life at Sea Convention (SOLAS) as the Safe Manning Document; "sufficient to ensure safe and efficient operation of the ship at all times." Chapter V SOLAS describes requirements "for safe manning in order to ensure navigational safety," however, not for military operations.

[5] Technically, there is an initial "Prepositioning" phase that precedes the surge sealift phase. In the Prepositioning phase, ships from the afloat pre-positioning force (APF) of the Military Sealift Command, preloaded with equipment and supplies, are kept located in key ocean areas to ensure rapid availability during a contingency. For the purposes of this study, this phase is included in the surge sealift phase.

Authorization Act for Fiscal Year 2017 (Pub. L. 113-328) directed the Maritime Administrator, in consultation with the USCG Merchant Marine Personnel Advisory Committee and the Committee on the Marine Transportation System, to convene the Maritime Workforce Working Group (MWWG). The Maritime Administrator ordered that the MWWG be established as a subcommittee of the Maritime Transportation System National Advisory Committee (MTSNAC).[6] The assignments for the MWWG included providing answers to certain significant questions related to the number of U.S. citizen mariners available to crew the sealift fleet in times of national emergency; assessing the impact on the U.S. Merchant Marine Academy (USMMA) and the State Maritime Academies (SMAs) if their graduates were assigned to, or required to fulfill, certain maritime positions based on national needs; assessing the value of the USCG's Merchant Mariner Licensing and Documentation System (MMLD) and its accessibility and utility to MARAD for evaluating the subset of sealift-qualified mariners; and making recommendations to enhance the availability and quality of interagency data used by MARAD for evaluating that mariner pool.

The completed MWWG report, sent by the Secretary of Transportation to Congress on January 23, 2018, begins with a summary of the availability of sealift-qualified mariners and compares this availability to the numbers needed to crew U.S. Government reserve and non-reserve sealift assets, as well as large self-propelled, oceangoing commercial merchant ships.[7] It also proposes methods by which more mariners might be retained.

The present "Opportunities and Challenges" report, which is based in part on analysis conducted for the MWWG report, further develops and adds to the potential methods to account for and retain these U.S. sealift-qualified mariners, including through support of the U.S.-flag merchant fleet, programs to reach out to mariners, and means of making greater use of the Nation's existing mariner base. Finally, the present report discusses certain benefits and costs and other considerations associated with establishing one or more additional SMAs to educate additional USCG-credentialed sealift-qualified officers.

[6] The U.S. Maritime Transportation System National Advisory Committee (MTSNAC) is a chartered, non-Federal body that advises the U.S. Secretary of Transportation, through the Maritime Administrator, on matters relating to U.S. maritime transportation and its seamless integration with other segments of the transportation system, including the viability of the U.S. Merchant Marine. MTSNAC is comprised of over 40 leaders from commercial transportation firms, port and water stakeholders, labor, and Federal, State and local public entities.

[7] MWWG Report, January 23, 2018, Tables 1 and 3.

AVAILABILITY AND RETENTION OF SEALIFT-QUALIFIED MARINERS

The next sections of this report discuss potential means to better identify available sealift-qualified mariners, work with industry to improve the retention of mariners and add to the mariner base, and increase the likelihood of full participation by this base under emergency sealift conditions.

Methods to Maintain the Existing Mariner Workforce: The Nation's sealift-qualified mariners are among the most highly-trained mariners in the world. To ensure that the Nation's need for an accessible and adequate supply of these mariners can be met during a national emergency, it is essential that the Nation make efforts to better identify and retain this workforce, maintain its skills, and assure that those mariners who are available will be willing to volunteer during emergencies. Most of the following actions to support these objectives were identified by the MWWG or by other industry stakeholders and may be considered as possible means to accomplish these objectives. However, these actions need to be analyzed further to determine their potential efficacy:

- Support a healthy commercial U.S. Merchant Marine.
- Fully crew the surge sealift fleet on a permanent basis.
- Fully account for existing mariner resources.
- Expand the reserve Strategic Sealift Officer Program (SSOP).
- Implement a purely civilian mariner reserve program.
- Create incentives for existing mariners to sail voluntarily during national emergencies.

Methods to grow the mariner base are described in the next major section of this report, although some of the actions addressed immediately below could support the expansion of the mariner base.

Support a healthy commercial U.S. Merchant Marine. MARAD and other agencies administer existing U.S. Government programs to support the Nation's need for sealift and economic security, including by providing stipends and guaranteed access to cargoes to large commercial oceangoing vessels that maintain a baseline level of job opportunities for sealift-qualified mariners. Actions and programs authorized under existing U.S. law or long-standing policy include:

- Funding of the Maritime Security Program (MSP) at the levels authorized by Congress through FY 2021 in the Consolidated Appropriations Act, 2016.[8]
- MARAD's enforcement of full compliance with the Cargo Preference laws.[9]

[8] Consolidated Appropriations Act of 2016 (Pub. L. 114-113, Dec. 18, 2015), Division O, Title I, Sec. 101(e) through the end of FY 2021. MARAD administers the Maritime Security Program to support a modern U.S.-flag fleet of 60 ships, which, via their required full participation in the Voluntary Intermodal Sealift Agreement program, provide the U.S. military with assured access to modern merchant-type vessels as well as a global, intermodal transportation network. This vessel and intermodal network includes specialized ocean cargo handling capabilities, logistics management services, inland infrastructure, and terminal facilities, and provides jobs to U.S. citizen merchant mariners who are also available (if they volunteer) to crew the U.S Government owned/controlled fleet.

[9] The Cargo Preference laws require that a prescribed share of U.S. Government-impelled cargoes transported on ocean vessels must be carried on privately-owned U.S.-flag commercial vessels, to the extent such vessels are available at fair and reasonable rates for commercial vessels of the United States. Per 46 U.S.C. § 55305, a government-impelled cargo is one that is owned, procured, furnished, or financed by the U.S. Government.

- Enforcement of full adherence to Section 27 of the Merchant Marine Act of 1920 (Jones Act). The Jones Act reserves maritime trade of merchandise between points in the United States (coastwise trade or domestic trade) for vessels that are owned by U.S. citizens and registered in the United States, built in the United States, and operated with predominantly U.S.-citizen crews.
- Streamline regulations that adversely affect the competitiveness of U.S.-flag vessel operations.

A healthy U.S. merchant marine is one that is economically competitive. Improving the efficiency of the U.S. merchant marine could increase demand for both U.S. flagged ships and U.S. mariners. Also, both economic and defense benefits could be gained through efficiencies in ship transport resulting from technological advancements in ship operations that reduce the number of mariners needed for both cargo transport and sealift purposes. Accordingly, it is critical to continuously improve the efficiency of maritime transport.

With the net loss of each large oceangoing merchant-type ship from the U.S.-flag commercial fleet, MARAD estimates that 40 to 50 existing sealift-qualified mariners would be forced to take jobs on smaller vessels (where their unlimited oceans skills could atrophy), sail on foreign flag vessels, or leave their jobs at sea for employment on shore, including in positions unrelated to the maritime industry.

Increasing the number of credentialed mariners could potentially be accomplished by reducing the cost of using U.S.- flagged/U.S.- crewed ships for transporting cargo. If such costs were reduced relative to the cost of transporting by foreign-flag ship, demand for U.S.- flagged ships may increase and, consequently, additional mariners may be needed to crew the ships. MARAD will continue to work with stakeholders to identify ways to reduce the cost of transporting cargo on U.S.-flagged/U.S.- crewed ships.

Fully crew the surge sealift fleet on a permanent basis. To reduce costs but maintain readiness, the U.S. Government's surge sealift fleet is maintained in ROS with a small compliment of CONMARs (private-sector mariners provided under a contract through a commercial ship operating company). If a surge sealift vessel is activated, additional mariners are brought on board to fully crew the vessel. As an alternative to this long-standing practice, and at significant additional expense (discussed below), the vessels could be fully crewed on a permanent basis, even when inactive. In this fully-crewed scenario, consideration could also be given to the use of CIVMARs (mariners who are Federal civil service employees) in place of CONMARs. The CIVMARs could be rotated periodically to U.S. Government vessels that are actively sailing to maintain proficiency.

The course of action would have the apparent benefit of assuring that the availability of crews would not impede the initial activation of the U.S. Government's 63 surge vessels and align the crewing of DoD vessels with dedicated crews as is the current practice with United States Air Force aircraft. It would also generate a net increase in full-time mariner jobs. For instance, whereas 626 mariners are currently employed on surge sealift vessels while in reduced operating status, employment of full crew on each of the 63 vessels would entail at least 1,300 more full-time equivalent (FTE) positions. When allowing for

vacation and sick time, another 300 FTE would be needed to assure full crew availability at any given time.

There are significant costs and possible adverse outcomes associated with this course of action. Among these are the following:

- The current surge sealift fleet can already be fully activated with private-sector mariners—the added security of dedicated full-time crew for the surge fleet would add little incremental benefit unless the U.S.-flag commercial fleet declines from current levels.
- Full crew would be maintained even though such crew are needed only in emergencies—costs to crew 46 RRF vessels with CIVMARs would more than double from current levels for the CONMAR ROS crew.[10]
- The employment of CIVMAR crew (which are generally paid lower wages than private sector mariner crews) would create long-term pension and other obligations for the U.S. Government.
- The current CIVMAR mariner-to-billet ratio of 1.22 would make it more challenging to find relief CIVMAR crew in a full-mobilization scenario lasting more than six months. Additional expense could be incurred if extra CIVMARs were retained to assure the ability to rotate surge sealift vessel crew after a protracted period of sealift sailing.[11]
- Crewing assumptions rely on the assessment that the required number of ships for a conflict is nearly the same as are currently maintained in the surge sealift fleet and in the MSP. Assessment of future requirements, expanded capabilities, and the effects of vessel losses are not considered. On the other hand, a larger commercial sector provides a deep pool of proficient sealift-qualified mariners that reduces the risk of unexpected increases in sealift and mariner demand.
- Use of U.S. Government CIVMAR crews in place of commercial crews could be perceived as a precedent for expanding the U.S. Government role in providing other marine shipping functions, including providing support to the U.S. civilian economy during wartime.

Commercial, private sector vessels and mariners would still be needed for sustainment sealift, and access to commercial intermodal networks during war and peacetime would remain vital. Similarly, unless there is a major increase in the number of CIVMARs (above the approximately 1,600 new CIVMARs for RRF vessels, described on the previous page) to provide for crew rotations, commercial mariners would be still needed to relieve CIVMAR crew in the event of a sustained full-scale motivation of the surge sealift fleet (and MSC CIVMAR-crewed vessels) lasting more than six months.[12] In other

[10] This estimate assumes that two-thirds of MARAD's $98 million annual ship manager expenses are for crew wages, whereas the loaded costs of using CIVMARS for the 46 RRF ships would exceed $150 million per year (including benefits). A much more detailed analysis would be necessary for a definitive cost comparison.

[11] It may be possible to use CONMARs not employed in the initial RRF activation to relieve CIVMARs, but this could only occur if the U.S. Government maintains its current peacetime support of the commercial U.S. Merchant Marine (otherwise the pool of available commercial mariner numbers would decline).

[12] The crew rotation needs of the existing 53 MSC CIVMAR-crewed vessels during a sustained emergency lasting more than six months were not addressed in the MWWG report.

words, even in a fully-crewed surge sealift fleet scenario, support for a healthy commercial merchant fleet would remain essential.

Even as new means might be found to sustain or create more jobs for sealift-qualified mariners, U.S. Government efforts could be expanded to identify and retain more qualified mariners from the Nation's existing workforce (see below).

Fully account for existing mariner resources. As stated above, additional research is needed to validate the number of fully qualified mariners, as well as better account for non-fully qualified mariners who could quickly transition to fully qualified status. Given the expense of educating new sealift-qualified mariners and the challenge of keeping existing mariners employed in oceangoing service, it is important that, in the immediate future, MARAD enhance its mariner outreach efforts and ability to query available data sources to fully account for all mariners able and available to crew sealift vessels.

Merchant Mariner Licensing and Documentation System (MMLD) – The principal source of mariner credential data for the United States is the USCG's MMLD. The MMLD accounts for more than 200,000 mariners who hold current USCG credentials of some type. Most of these mariners, however, do not hold credentials with unlimited oceans endorsements and therefore are not qualified to operate large self-propelled oceangoing vessels needed for sealift. Rather, they work on towboats on the inland waterways, near-coastal tugs and barges, offshore supply vessels, dredges, other workboats, and small passenger vessels. The MMLD accounts for approximately 33,000 mariners who have unlimited oceans credentials, including multiple endorsements. However, this does not reflect the number of such mariners who also have recent sailing experience (sailed in the last 18 months) on large oceangoing vessels, which is a better estimate of credentialed and available mariners with unlimited oceans credentials. Neither the MMLD nor the MWWG provide information on the number of mariners who would participate in a real-world contingency to crew surge or commercial vessels, as participation is voluntary.

The USCG developed the MMLD in the 1990s to issue mariner licenses and documents in a consistent and timely manner. The MMLD was not developed to quantify information on active, credentialed mariners available for national sealift purposes, nor was it intended to query for this type of information. As the MMLD has grown and the types of credentials have changed and expanded through both regulatory changes and international requirements, the MMLD's limitations as a source of mariner statistics has been greatly amplified, particularly over the last decade.[13]

More generally, the MMLD is acknowledged by USCG and other persons familiar with it to have the following limitations if used to account for active mariners:[14]

- It does not consistently (nor was it designed to) relate what a mariner does with his/her USCG credential once it is issued. For example, it typically does not record if a mariner is serving on an offshore supply boat, is employed ashore, or on a foreign-flag vessel, etc.

[13] MWWG Report, January 23, 2018, p 6.
[14] MWWG Report, January 23, 2018, p. 17.

- Most MMLD records do not list recency of sea service or adequately identify the vessels on which the mariners sailed, although in some cases sea service records (when available) may indicate service on specific vessels.
- Mariners may renew their credentials/endorsements without recent sea experience by taking exams or courses.
- The MMLD does not track deceased or incapacitated mariners unless the mariners or their families report such incapacitation and/or if they fail to renew their Medical Certificates or Merchant Mariner Credential.
- A mariner listed as holding current credentials in the MMLD does not imply that the mariner is available or willing to sail in a national emergency.

Despite these limitations, at the request of the MWWG, USCG developed queries to extract data from the MMLD on the number of mariners holding credentials with endorsements to operate ships in ocean environments without limits on tonnage or horsepower. The MMLD queries identified 33,215 mariners with unlimited credentials that were issued in the last 5 years. This number is more than twice as large as calculated for sealift-qualified mariners. However, the queries made by USCG included CIVMARs as well as mariners for whom closer scrutiny could not confirm that they had sailed recently or had sailed on large self-propelled oceangoing ships, or if they had been categorized correctly as having credentials with appropriate endorsements.[15]

By way of example, MARAD looked in detail at the MMLD data extracted by USCG on vessel Masters holding credentials with national and international unlimited oceans endorsements and a valid STCW medical certificate. MARAD found that some of the Masters (approximately 1 in 10) identified in the USCG query had USCG-imposed limitations in their credentials based on vessel size or other criteria, meaning that they were probably incorrectly selected by the query as having unlimited endorsements. Of Masters that appeared to have credentials with unlimited oceans endorsements, MARAD found records of sea service in the MMLD for only 53 percent of them, and only 35 percent of the Masters had records of sea service within the last 18 months. Neither USCG nor MARAD had sufficient time during the MWWG study process to cross-check for international STCW limitations on vessel size served by these Masters (other than the possession of STCW medical certificates), which in some cases may have excluded additional mariners from the status of having credentials with unlimited oceans endorsements suitable for transoceanic sealift service. MARAD also did not have sufficient time during the timeframe of the MWWG task to study the detailed, individual records of each of the mariners listed in categories below the position of master.

As noted, the alternative, non-MMLD methodology used by the MWWG, supported by union counts of member and non-member mariners, is designed to estimate the number of active or recently-active private sector mariners qualified to operate the 281 ships in the commercial and U.S. Government-

[15] MWWG Report, January 23, 2018, p. 23.

owned fleet of large, self-propelled, oceangoing merchant-type ships.[16] Mariners on these ships have appropriate credentials and have sailed recently (within the prior 18 months[17]) and therefore are proficient and current in training and other criteria (e.g., hold current Transportation Worker Identification Credential (TWIC)) needed to be sealift qualified. This approach clearly has inherent data limitations, however, in that it does not generate the names, addresses, and willingness to volunteer of these mariners and it does not account for private sector mariners qualified to operate large vessels who are sailing on limited tonnage vessels, sailing on foreign-flag vessels, or who have sailed in the last 19-60 months Such information would need to be provided by companies, unions, and individual employees—data that were not available to the MWWG (many of these records would be confidential to companies, unions, and individual mariners). For future efforts to account for sealift-qualified mariner availability, an approach like the Mariner Outreach System would be more informative for planning to activate and sustain the Nation's sealift assets, while safeguarding any sensitive individual mariner data that may be resident in the MOS.

Mariner Outreach System – Prior to 2014, MARAD relied on data from the MMLD, supplemented by other mariner data sources, to operate MARAD's Mariner Outreach System (MOS). The MOS is designed to monitor the active U.S.-flag fleet and help ensure that there are sufficient mariners to meet DoD's surge sealift requirements in a time of national emergency or sealift crisis. To achieve this, the MOS generates reports based on a combination of data about mariner demand (to crew vessels needed for surge, sustainment, and commercial requirements during a contingency) and mariner supply (based on data from the USCG MMLD, vessel operators, mariner unions, and mariners themselves).[18] Collectively, these data should (if the system is working correctly) allow MARAD and its Federal partners to better estimate sealift-qualified mariner availability, identify potential mariner shortfalls, and strategize crewing options should shortfalls occur.

The MOS provides functionality which allows individual mariners, via its web portal, to consent to be contacted in the event of a national emergency and provide updated sea service and contact information (this information in the MMLD could be as old as five years). It is important to note, however, that a mariner's consent to be contacted in the event of a national emergency does not commit the mariner to sail in such an emergency. In return for signing up to the MOS, MARAD allows mariners to access and review their contact information, MMLD credential information, and sea service records (if available from the MMLD data).[19] MOS functionality must also address the protection of any

[16] These 281 ships are crewed by private sector mariners, not civil service mariners (i.e., CIVMARs) employed by the U.S. Government to operate naval auxiliary vessels. Six of the vessels operate under a foreign registry but employ some U.S. mariners, the remaining 275 ships are U.S. registered.

[17] The "sailed in the prior 18-month" definition of recency of sea service is specified on Section 3517 of the National Defense Authorization Act for Fiscal Year 2017 (Pub. L. 114–328, December 23, 2016).

[18] For planning purposes, MARAD assumes the full activation of the RRF and MSC surge sealift fleets, and that all U.S.-flag large, self-propelled merchant-type ships would be needed for military and domestic economic needs during a conflict. DoD typically does not specify the need for a given number of U.S.-flag vessels or citizen mariners, however. Ultimately, MARAD defers to DoD pronouncements on the adequacy of current U.S.-flag vessel capacity and mariner availability and would respond aggressively to address any shortfalls identified by DoD.

[19] Data provided by mariners to MOS does not update or change the MMLD itself unless the mariner also submits them to USCG.

sensitive personal information provided by individual mariners in furtherance of the national emergency mission.

After March 2014, however, USCG ceased encoding mariner credential data in specialized MMLD data fields and instead recorded this information exclusively as free text within the database. This change in practice disrupted the interface between the MOS and the MMLD. This disruption took some time to diagnose, as the USCG's transition to the new free-text process progressed gradually. Increasingly, however, mariner estimates from the MOS diverged from employment levels reported by unions and other sources. MARAD was thus forced to discontinue reliance on MOS mariner estimates, turning instead to the methodology endorsed by the MWWG to estimate the number of sealift-qualified mariners, notwithstanding its data limitations.

Methods to improve the identification of sealift-qualified mariners – The following are potential actions that could restore functionality to the MOS and enhance MARAD's ability to account for the availability and willingness of sealift-qualified mariners to crew U.S. sealift assets:

- Resolve problems in the interface between the MMLD and the MOS. MARAD is currently working with its contractors and USCG to modify the MOS to work with the free-text format now used in the MMLD. To do so, MARAD has to pre-process data received from the MMLD by reading text strings pertaining to mariner credentials and then encode this information into pre-existing MMLD fields that are readable by the MOS. This modification to the MOS is complicated because the text wording used to record credential and endorsement information can vary from mariner to mariner (based on different combinations of limitations listed under the credential) and may also include variations due to typographical errors and text formats that change over time. For instance, using MMLD data as of March 31, 2017, MARAD found 27,024 combinations of endorsement/limitation data for national credentials, and 10,130 different combinations of endorsement/limitation data for international credentials.[20]
- Replace the MMLD with a more comprehensive mariner database. The MWWG's analysis of the existing MMLD and its capabilities highlighted shortcomings, described above. Consequently, the MWWG recommended that a new system for recording Merchant Mariner Credentials be implemented to address these shortcomings and to provide for additional capabilities that would assist in more accurate counts of available sealift-qualified mariners.[21] However, even if USCG decides to go forward with a new database and funding for this effort is secured, it would take several years to develop and test the new system. Consequently, the restoration of the interface between the MOS and the MMLD would be beneficial to accommodate data needs during the multiyear period before a new database would become operational.

[20] Limitations imposed in a credential might preclude operation of vessels above a certain size or horsepower, or in a specific geographical area, or of a certain type of vessel. Not all limitations would exclude a mariner from being classified as having a credential with an unlimited oceans endorsement. For instance, almost all mariners have limitations in their credentials that exclude them from operating self-propelled ships with "auxiliary sail" even though other types of self-propelled vessels are permitted. Since there are no large merchant vessels (over 1,600 gross tonnage) powered by auxiliary sail currently in the U.S.-flag fleet, this limitation does not affect the mariners' ability to operate sealift vessels of any size or horsepower; hence the mariners (assuming no other limitations) are listed as having credentials with unlimited oceans endorsement.

[21] MWWG Report, January 23, 2018, p. 37.

- Periodic surveys of U.S. mariners. MARAD is in the process of re-establishing biennial surveys of the pool of U.S. citizen mariners qualified to crew U.S. Government sealift vessels, and expects to have results from the next survey in 2021. MARAD successfully conducted two such surveys in 2001 and 2002, but did not continue them until now because of resource limitations and other priorities of that time. These surveys were helpful tools that provided more accurate data to stakeholders on the number of available sealift-qualified U.S. citizen mariners. Even with enhancement or replacement of the MMLD, the number of people willing to sail voluntarily in times of national need will remain unknown until results from the survey are available. The reestablished survey will be a tool for regular monitoring of changes in the mariner workforce's availability and willingness to sail.
- Enhance interagency coordination between USCG and MARAD, including securing MARAD's participation in USCG's Change Control Process for the MMLD. Improvements in coordination could be reflected in an updated memorandum of agreement (MOA) between MARAD and USCG. The MOA, last updated on November 22, 2016, establishes the procedures for transferring specified MMLD data from USCG to MARAD and the terms for data transfer and subsequent sanitizing of the extract. It specifies that if USCG makes changes to the MMLD database structure that impact the format of the extract, as specified in the Data Security Management Plan, the USCG shall provide MARAD with a listing of the changes made and technical support to help MARAD understand the changes made to the extract, and the impact these changes may have on MARAD's ability to adequately monitor the pool of available sealift-qualified mariners. Future MOAs might provide that MARAD be consulted in advance of the implementation of changes to determine if such changes would impose major costs to MARAD that might be avoided with minor adjustments to the proposed changes. Such coordination could enhance the transmission of data between USCG and MARAD, as well as prevent future disconnects between the MOS and the MMLD (or successor databases) due to changes in data management processes.
- Plan for future mariner needs. MARAD could work with USCG, DoD, and other partner agencies to develop clear scenarios for expected increases in automation of vessels, including the possible integration of artificial intelligence into commercial vessel operations, and how they would affect the future supply of and demand for mariners. This analysis could include specifying timeframes for vessel introductions, ability of the new vessels to meet military sealift needs, and timing of the phase out of older vessels from the RRF, MSC, and commercial fleets. This study could also be matched to the ability of maritime academies and public, union, and private maritime schools to prepare mariners with skills for both operating traditional vessels and supporting advancements in automation.[22]

Expand or establish a mariner reserve program. One means of assuring an adequate base of mariners is through a Government-administered reserve program. Currently, there is one such program, the U.S. Navy Strategic Sealift Officer Program (SSOP), under which cadets from the Federal and State

[22] See "Educating New Mariners" later in this report for more information about maritime schools and training institutions.

maritime academies can be commissioned as officers in the U.S. Navy Reserve once they have graduated and earned unlimited credentials as deck or engine officers.[23] The SSOP officers, who must serve when called, could be activated if sufficient mariners did not volunteer.

However, because SSOP officers are either actively employed and sailing, or on active military duty, they are treated as a subset of the total number of the actively sailing mariner pool and not an addition to the total pool of mariners described for this report.[24] The program could potentially be expanded in size by recruiting more officers or, in a major expansion of scope, by establishing an SSOP-like program (as part of the U.S. Navy Reserve) for unlicensed mariners.

Either as a complement or alternative to expansion of the SSOP, MARAD could study the potential establishment of a civilian mariner reserve program, without requiring that participants belong to a military reserve program. Such a program might help ensure that sealift-qualified mariners (particularly those in shipboard positions where there may be significant shortages, such as Chief Engineers with a steam propulsion endorsement) are available to sail when a national emergency arises. Using information from the MMLD, MOS, U.S. Transportation Command (USTRANSCOM)/MSC, and other sources, the civilian mariner reserve program could reach out to mariners to verify recency of sea service and their availability and willingness to sail during sealift emergencies. An additional possible approach for this program would be to recruit former mariners (including recent retirees from the national workforce or those persons leaving active sailing careers for jobs ashore) who opt (or would be willing) to keep their mariner credentials active or place them under Documents of Continuity (discussed later in this document). Emphasis could be given to recruiting those mariners who have retired from active sailing within the last 18 months, who therefore would still have current sailing experience and meet all the recent international mariner training requirements prior to their decision to retire from active sailing. The U.S. military also produces capable sailors (not part of the SSOP) who could serve in unlicensed mariner positions with appropriate training and USCG certification. On March 4, 2019, the President signed an Executive Order to facilitate the transition of military services members into the civilian merchant marine. The order directs the USCG to waive certain requirements for applicants who have had comparable training while serving in the military.

The design of such a civilian program would require MARAD to work closely with USTRANSCOM/MSC, USCG, other U.S. Government agencies, unions, and employers. As part of the program's design, MARAD could consider the efficacy of having the civilian reserve program provide limited financial and other assistance to mariners, such as to obtain continuing education needed to maintain or reactivate their credentials, in return for which participating mariners would accept an obligation to sail in the

[23] The U.S. Navy Strategic Sealift Officer Program (SSOP) is a subset of the U.S. Navy Reserve. It is open only to mariner officers with active credentials who are Navy Reservists (although not all mariner officers with active credentials in the Navy Reserve belong to the SSOP). Thus, the SSOP cannot include officers who are not in the Navy Reserve or unlicensed mariners. The SSOP replaced the earlier Merchant Mariner Reserve program.

[24] As of May 23, 2017, the SSOP comprised of 2,253 officers, split almost evenly across the deck (1,064 endorsements) and engine (1,058 endorsements) (66 in inactive status). See MWWG Report, January 23, 2018, pp. 30-31.

event of a declared emergency. The program could also provide support for specialized training, credential renewal, and sea time opportunities. The cost of this limited assistance would be compared to the costs of maintaining mariner numbers through existing programs. Any potential program design would likely begin with a smaller pilot program that would allow refinement of mariner augmentation methods and incentives.[25]

Expansion of the SSOP or creation of a civilian mariner reserve program could be a more practical approach to resolving critical mariner shortages than would new legislation mandating that graduates of SMAs or other mariner training programs sail during an emergency. Current service obligations for USMMA graduates are established by law and are fully understood as a condition for receiving the Federally-funded education. Similarly, SMA students taking advantage of the SIP program agree to service requirements in advance. Changing the terms of these agreements retroactively, or establishing mandatory requirements for SMA graduates not receiving direct Federal aid through the SIP program, would be strongly contested and would likely discourage new entrants into the USMMA, SMAs, and the U.S. Merchant Marine in general.

Incentivize existing mariners to sail voluntarily during national emergencies. Either as a part of a civilian mariner reserve program, or separately from it, MARAD could publicize and enhance programs intended to facilitate or encourage mariner participation during a national emergency.

- Reemployment protection for merchant seamen. Reemployment protection for merchant mariners is found at 46 USC § 52101 and 46 CFR 349.5. Under these authorities, U.S. merchant seamen who voluntarily leave their existing employment for employment on a vessel owned, requisitioned, chartered, or controlled by the U.S. Government and used by the U.S. Government for war, armed conflict, national emergency, or maritime mobilization (including for training purposes or testing for readiness and suitability for mission performance) are entitled to receive reemployment rights like those available to military reservists. These authorities have not been tested in practice, however, and there is little awareness of reemployment protection among mariners or their employers. In June 2019, MARAD posted more extensive guidance on current reemployment protections, which may encourage mariners with steady jobs on shore or commercial ships to be more willing to serve temporarily on RRF or other U.S. Government-controlled ships during a contingency.

  MARAD could also propose the expansion of statutory authority to extend reemployment rights to mariners (including mariners who have recently stopped sailing) who voluntarily leave their

[25] Design of the civilian mariner reserve program could also explore incorporation of residual functions of the U.S. Maritime Service (USMS). The USMS was active during World War II and the years immediately following the war, educating a large number of Merchant Marine officers under expedited conditions to serve during the wartime emergency. The USMS has largely been dissolved and/or absorbed into other Federal departments, and is now administered under the authority of MARAD. It currently consists of a small number of commissioned officers who function as administrators and instructors at the USMMA and the Superintendents and Training Ship Captains of the State Maritime Academies. The USMS, either as part of or separate from a civilian mariner reserve program, could oversee the development of emergency training programs to be used if unexpected and severe shortages of sealift-qualified mariners were to develop prior to an expected contingency and which could not otherwise be mitigated through existing academies and training programs.

existing employment during a U.S. Government-declared national emergency to serve on any commercial vessel carrying DoD cargo (even though the U.S. Government has no control of the vessel) or, at the U.S. Government's request, to crew specific commercial service vessels supporting the civilian economy during the emergency (even though the vessels are not controlled by the U.S. Government). The latter volunteers could temporarily replace mariners on these ships who volunteer to serve on surge sealift vessels, thereby enabling the commercial vessels to continue to meet civilian needs during the contingency. Significant research is needed before such a proposal could go forward.

- Promote greater participation in the Student Incentive Payment (SIP) program among SMA students. The SIP cadets receive tuition assistance of up to $8,000 per school year, not to exceed 4 years. In exchange for the financial assistance, graduates of the SIP Program incur a service obligation, including the requirement to be active in a U.S. Armed Forces reserve unit for at least eight years.[26] The current level of budget appropriations, however, permits only 75 new students to enter the SIP program each year, relative to the almost 900 cadets who graduate annually from the SMAs with officer endorsements. MARAD could evaluate means to improve the execution of the SIP program to obtain greater participation and retention of sealift-qualified mariners graduating with a service obligation. This evaluation could consider increasing the number of SIP slots each year and increasing the benefits per participant to defray the increasing educational costs associated with licensing programs offered at the SMAs. Also, SMA cadets are in high demand in non-maritime sectors of the economy; the obligation to serve at sea may require increased compensation to compete with offers from these competing sectors.

[26] Following graduation, if the graduate does not enter the armed forces of the United States on active duty, the SIP participant must be employed in the maritime industry for at least three years (preferably sailing on U.S.-flag vessels), maintain a USCG credential as an officer in the U.S. Merchant Marine for six years, be active in a U.S. Armed Forces reserve unit (provided the graduate is accepted into a reserve unit) for at least eight years, and report annually his or her service obligation compliance to MARAD until all service obligation components are fulfilled. The eight-year reserve requirement applies to the graduates in the class of 2020 and subsequent classes (earlier classes were subject to a six-year reserve requirement).

INCREASING THE NATION'S POOL OF AVAILABLE SEALIFT-QUALIFIED MARINERS

The previous section of this report focused primarily on identifying and retaining existing active mariners and considered various methods to do so. This section considers approaches to add to the sealift-qualified mariner base by reactivating former mariners, upgrading existing sealift-qualified mariners to higher-ranked positions, upgrading mariners who are currently not sealift-qualified to unlimited oceans qualifications, bringing former military personnel into the Merchant Marine, and training and educating new mariners.

MARAD notes that the establishment of a civilian mariner reserve program (described in the previous section), if found to be practical and cost-effective, would be one potential forum through which to secure the availability of additional mariners, particularly to support post-surge sustainment sealift operations. Even without a new reserve program, DOT/MARAD, working closely with DoD and USCG, could implement the approaches outlined below. One longer-term option to add sealift-qualified mariners, and which Congress directed MARAD to consider for this study, would be to increase the number of State maritime schools.

Mariners Whose Credentials could be Revalidated, Reactivated, or Upgraded Quickly: Several sources of additional sealift-qualified mariners, which the U.S. Government could encourage or support, are listed below:

1. Enhancing mariner readiness and training. Mariners who still have active credentials with unlimited oceans endorsements, but who have not sailed within 18 months, could be kept ready for immediate sealift service by ongoing training and periodic deployments on large U.S. Government or commercial oceangoing ships. Similarly, they could be encouraged to renew their credentials and keep their medical certificates current. Training and sea time could be supported through SSOP or a civilian mariner reserve program.
2. Reactivating mariners from continuity status. When moving to shore-side jobs or otherwise taking extended time off from sailing, a mariner may decide to apply to USCG for a Document of Continuity rather than letting his or her credential expire. With a Document of Continuity and appropriate support, the mariner can re-enter "active" status much more readily in the future if the need arises.
3. Upgrading mariners' credentials. Another potential source of sealift-qualified mariners would be to sponsor training and sea time needed to upgrade the credentials of currently active mariners, either increasing the rankings of active mariners who already have credentials with unlimited oceans endorsements, or by qualifying mariners whose credentials do not currently have endorsements to operate in deep oceans environments. This approach would be particularly helpful for situations where such additional training cannot be commercially justified or paid for by companies or unions due to a lack of employment opportunities requiring sealift-qualified mariners.

4. Expand the obligations of new USMMA graduates and recipients of SIP at SMAs. Extending the length of these requirements for new graduates of the academies could expand the pool of available mariners in future years.
5. Accessing skilled current and former military personnel. There are active and retired military personnel with experience sailing on large Navy and Army vessels who could, with some additional coursework and assessments, qualify for USCG credentials with unlimited oceans endorsements and meet other requirements to operate sealift vessels.

Mariners kept sealift ready with training and sea time. Mariners may leave their careers at sea at any point following the renewal of credentials (which must be done every 5 years). This may be triggered by a lack of shipboard employment opportunities, family matters, or other factors. Once active sailing ceases, those skills may begin to atrophy, particularly in an environment of changing technologies or regulations. The establishment of programs to enable mariners to periodically sail or receive training, particularly as part of a mariner reserve program, could assure that these mariners could be immediately available for sealift services and would also have incentives to renew their Merchant Mariner Credentials and keep their medical and other certificates current.

Mariners reactivated from continuity status. Deck officers, engine officers and qualified ratings such as able seamen or qualified members of the engine department are eligible to obtain a Document of Continuity. This document enables mariners who cannot, or choose not to, meet the renewal requirements to actively sail to place their credentials into an inactive, continuity status. These mariners are not allowed to sail under their credentials while in continuity status, but they can reactivate their credentials later by taking USCG-prescribed courses and tests. Mariners holding a Document of Continuity who wish to reactivate their credentials must also apply for a TWIC in addition to satisfying the basic renewal requirements applicable to all mariners. Unlike an active credential that expires every five years, a Document of Continuity is good indefinitely. Even active mariners may take advantage of continuity by placing certain specialized (but recently unutilized) endorsements into this status. For instance, an unlimited mariner with a towing license, but without any sea time on towing vessels since his or her last renewal, could place the towing license in continuity while keeping the unlimited license active (or vice-versa). STCW endorsements, however, may not be held in continuity. Mariners must take additional training to renew STCW endorsements.

The Nation's sealift readiness could benefit from an improved ability to identify the number of mariners whose credentials with unlimited oceans endorsements are in continuity status and who would also be able and willing to reactivate their credentials quickly for a sealift emergency. Potential actions to access this mariner pool include the following (already described earlier in this report):

- Improved scrutiny of MMLD (or successor database) credential information through the MOS.
- Periodic surveys of U.S. mariners concerning their credential status and interest in reactivating their credentials to sail during times of national emergency.
- Development of more comprehensive and formal enforcement mechanisms to assure reemployment protection for merchant seamen who reactivate their credentials and sail during a sealift emergency.

- Establish a civilian mariner reserve program.

A civilian mariner reserve program, if found feasible, could serve as the principal means of outreach to the community of mariners holding Documents of Continuity. This program could also be used to coordinate with the USCG to provide information to mariners who want to reactivate their credentials. Through this program, mariners seeking to reactivate their credentials could obtain information on the appropriate courses and tests required and potentially receive Federal support and funding for required training, permits, and sea time to become sealift-qualified in exchange for their commitment to sail during emergencies.

Upgrading mariner credentials. In some cases, there may be more than sufficient numbers of sealift-qualified mariners in some categories (e.g., Third Mates) but inadequate numbers in higher categories (e.g., Chief Mates) or specialized categories. To rectify this, it may be possible for the U.S. Government to sponsor sealift-qualified mariners to upgrade to these categories if needed to operate U.S. Government sealift assets (e.g., engineers with a steam propulsion endorsement are needed to operate more than half of RRF vessels but very few commercial ships require such an endorsement). Without U.S. Government sponsorship, there might be little incentive or opportunity in the U.S.-flag commercial fleet for the mariner to pursue specialized endorsements. With required training and sea time, some of those deck and engine officers could be advanced to fill identified gaps in mariner categories and induced to commit to sail in these categories during an emergency.

Similarly, there is also the opportunity to draw from mariners not currently holding credentials with unlimited oceans endorsements but whose credentials could be upgraded to unlimited status by additional training and sea time on large oceangoing vessels. In some cases, particularly with experienced mariners working on large near-coastal vessels (e.g., offshore support vessels), U.S. Government financing (in part or in whole) of the additional training and experience needed to qualify for unlimited oceans endorsements, in exchange for a commitment by the mariner to volunteer in an emergency, could cost much less to the Nation than it would cost to educate a completely new mariner recruit.

Potential actions suggested in the previous section to help retain existing mariners would also provide information necessary to identify and sponsor mariners whose credentials might be the most cost-effective to upgrade. These potential actions include:

- Improved scrutiny of MMLD (or successor database) credential information through the MOS.
- Periodic surveys of U.S. mariners concerning credential status and interest in volunteering to sail during times of national emergency.
- Establish a civilian mariner reserve program.

The civilian mariner reserve program could target communications to likely candidates for upgrades (identified via MMLD, MOS, and mariner surveys) and could potentially arrange training and additional sea time in exchange for their commitments to sail during national emergencies. If approved to go forward, the development of this program to upgrade credentials and other programs described above

would be undertaken in close cooperation with USCG and DoD and would likely take several years to fully implement.

Expand the obligations of new USMMA graduates and recipients of SIP at SMAs. Currently, SIP recipients at SMAs are required to be employed or serve in the U.S. maritime industry for three years after graduation and maintain their maritime credentials for six years. Already, compliance with the six-year requirement requires renewal of credentials at the end of five years (credentials are good for five years), meaning that credentials remain active for a *de facto* period of 10 years even under current practice; however, renewal of medical certificates would be required for sailing.

USMMA graduates are required to be employed or serve in the U.S. maritime industry for five years and maintain their credentials for six years. All graduates of the USMMA and those graduates of the SMAs who receive SIP also incur service obligations, including that they must be active in a U.S. Armed Forces reserve unit (if accepted into one) for at least eight years (beginning with Class of 2020). Extending the length of these requirements for new graduates of the academies could expand the pool of available mariners in future years, but would require a statutory change.[27] If requirements were to be extended, care would need to be taken so as not to discourage participation. This is particularly true for the SIP Program. Any new requirements would need to be for new students only. Also, the U.S. Government currently has no authority to impose conditions for employment, credential, or reserve requirements on SMA graduates who do not receive the SIP assistance. It should be noted that an extension of the time a cadet is required to maintain valid Merchant Mariner Credentials beyond six years would be the least disruptive of any potential changes.

Accessing skilled current and former military personnel. MARAD is collaborating with the Committee on the Marine Transportation System (CMTS), DoD, USCG, other Federal agencies, and industry to support the current Military-to-Mariner credentialing program that helps veterans transfer the skills they learned in the Armed Forces and transition into civilian careers within the maritime industry.[28] In support of this effort, the President signed an "Executive Order on Supporting the Transition of Active Duty Service Members and Military Veterans into the Merchant Marine." This order recognized the vital role U.S. merchant mariners play in support of military sealift operations, and directs the Secretaries of Defense and Homeland Security in coordination with the CMTS, within applicable laws, to provide "…support and resources to active duty and separating service members who pursue or possess merchant mariner credentials." Consideration could be given to provide such training to military personnel prior to the end of their military careers. Efforts should continue to focus on making the process as user-friendly as possible, with guidance on how best to use various veterans' benefits and other educational grants such as those identified by the Government Accountability Office in its recent report on mariner training needs.[29]

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[27] USMMA graduate requirements are established by 46 U.S. Code § 51306 - Cadet commitment agreements. SMA SIP recipient requirements are established by 46 U.S. Code § 51509 - Student incentive payment agreements.
[28] U.S. Coast Guard, "5 things to know about the Military to Mariner credentialing program" http://allhands.coastguard.dodlive.mil/2017/02/02/5-things-to-know-about-the-military-to-mariner-credentialing-program/.
[29] Government Accountability Office, U.S. MERCHANT MARINE: Maritime Administration Should Assess Potential Mariner-Training Needs, GAO-12-212, January 2014.

Educating New Mariners. The United States has an extensive educational infrastructure for the training of mariners of all types. Working with this infrastructure and other U.S. Government Departments, MARAD supports the education and training of Americans from all walks of life for careers in the maritime industry. In addition to operating the USMMA, MARAD provides support and limited financial assistance to the six SMAs located in California, Maine, Massachusetts, Michigan, New York, and Texas, including by loaning training ships to these academies. MARAD also administers SIP assistance to participating students enrolled at the above six SMAs. Additional support activities through MARAD include the donation of limited quantities of surplus equipment to SMAs, technical and community colleges, high schools, and union-operated training centers that specialize in educating and training Americans for careers in the maritime industry.[30]

In addition to the USMMA and six SMAs, there are more than 20 community and technical colleges that offer programs intended to educate mariners. While these two-year schools do not produce sealift-qualified students at graduation, many among them have USCG-approved maritime training and coursework for entry-level mariner jobs and establish a foundation from where their graduates could advance in their careers.[31] Moreover, these schools help to meet the Nation's economic need for mariners and other personnel on the inland and near-coastal maritime sectors.

Pursuant to Section 3507 of the National Defense Authorization Act, 2018, P.L. 115-91 (December 12, 2017), codified at 46 U.S.C. 54102, the Secretary of Transportation is authorized to designate covered training entities as Centers of Excellence for Domestic Maritime Workforce Training and Education (CoE) and enter into cooperative agreements with designated CoEs. Among the requirements of a covered training facility are that it be a community or technical college, or a maritime training center operated by or under the supervision of a State. Assistance that MARAD can provide under cooperative agreements with CoEs includes donation of surplus equipment; temporary use of MARAD vessels and assets for indoctrination, training, and assistance; MARAD subject-matter experts to address students; and provision of funding, to the extent such funds are appropriated and available for CoEs under appropriations law.

There are also over 60 kindergarten-to-12th grade schools across the Nation that introduce students to maritime careers.[32] These schools attract the attention and interest of youth to the maritime industry, which unlike other modes of transportation such as trucking, is often invisible to them.[33] Finally, USCG

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[30] Examples of donated surplus equipment over the last several years include 4 diesel engines to the California State University Maritime Academy, 3 lifeboat radios to the Calhoon MEBA Engineering School, and 21 sailboats to the State University of New York Maritime College.

[31] See, for instances, the website for San Jacinto College (Maritime) at https://www.sanjac.edu/continuing-professional-development/corporate-and-workforce/maritime or Seattle Central College/Seattle Maritime Academy at https://maritime.seattlecentral.edu/programs/marine-engineering-technology/learning-and-coursework.

[32] See Primary and Secondary Schools with Maritime and/or Marine Science/Technology Programs at http://www.mpsecoalition.org/uploads/6/8/6/1/68617087/list_of_maritime_primary_and_secondary_schools_12302016.pdf.

[33] U.S. Coast Guard, Proceedings, The 21st Century Maritime Workforce: Recruiting and training the next generation," January-April 2017, p. 8, http://www.dco.uscg.mil/Portals/9/DCO%20Documents/Proceedings%20Magazine/Archive/2017/Vol74_No1_Jan-Apr2017.pdf?ver=2017-05-31-121003-980.

maintains a comprehensive listing of approved mariner training courses and programs, including at maritime union training institutes, which extends to more than 900 pages of listings.[34] These programs are widely used by mariners to upgrade or remain current on their credentials, including credentials with unlimited oceans endorsements.

Role of State Maritime Academies. Almost all officer positions on large U.S.-flag merchant ships are currently filled by graduates of the USMMA and six SMAs. Close to 900 of the almost 1,100 sealift-qualified cadets holding credentials with unlimited oceans endorsements who graduate annually come from the SMAs. A small number of U.S. mariner officers holding credentials with unlimited oceans endorsements are also produced via the so-called "hawsepipe" approach (in which mariners work their way up to officer positions through on-the-job training supplemented by training courses).[35]

One approach to training more USCG-credentialed sealift-qualified officers would be to expand the number of SMAs and, where possible, expand the number of qualified graduates from the six existing SMAs.

Another alternative is to increase the capacity of the USMMA above the current student body of approximately 1,000 Midshipmen.[36] This would have the immediate benefit of supplying additional USCG-credentialed sealift-qualified officers who are obligated to serve in the maritime industry for at least 5 years and maintain their license active for at least 6 years.

Graduating approximately 1,100 graduates with unlimited oceans licenses each year would appear to be sufficient to accommodate the current peacetime need for entry-level, sealift-qualified deck and engine officers in the U.S. commercial and Government-owned merchant-type fleets. Not all these graduates will commit to careers as oceangoing mariners; however, provided there is a program (such as a civilian mariner reserve program) to reach out to these graduates (whether in active or continuity status), the skills they learn at the academies can be maintained and later used to great value for sealift emergency support. There is also little risk of over-supply of cadet graduates during non-emergency conditions. SMA and USMMA cadets graduate with management, technical, and engineering skills that are highly sought after by the economy at large. Another significant advantage that potential employers find among SMA and USMMA graduates is their leadership, communication, and teamwork skills, along with exemplary self-discipline nurtured over their four-year regimented lifestyle on campus.

Proponents of adding one or more SMAs or increasing the enrolment at USMMA cite the high return on investment for students attending an SMA or the USMMA. Nearly 100 percent of each graduating class of the existing six SMAs and USMMA are employed within the first three months of graduation and are

[34] The USCG Training & Assessment team evaluates Courses/Programs and their associated Sites, Instructors, Assessors and Proctors for approval. In addition, the team also evaluates Designated Examiner and Qualified Assessor requests. See http://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/National-Maritime-Center-NMC/Training-Assessments/.

[35] Based on consultation with mariner unions and industry, MARAD estimates that fewer than 5 percent of sealift-qualified officers are "hawsepipers."

[36] The USMMA facility could currently accommodate up to 1,200 Midshipmen, but to reach this level would require additional Federal expenditures to acquire additional faculty, training equipment, and other materials.

in well-paying jobs.[37] The Payscale College Return on Investment Report ranks USMMA as the nation's "Best Value" college and includes four SMAs among the top 50 colleges in the United States (out of over 1,000 colleges rated for "Best Value") as measured by the higher earnings of a graduate over a 20-year period following graduation (net of the cost to the graduate of his or her higher education, including tuition, fees, room and board, and books and supplies) compared to the earnings of a high school-only graduate over a 24-year period following graduation.[38]

SMAs can also have important social mobility benefits. Among all California's colleges and universities, the California Maritime Academy has been the most successful institution in providing students originating from lower income families (defined as from the lowest 20 percent income bracket) with knowledge and skills needed to move into careers where they earn incomes that fall in the top 20 percent income bracket.[39] In particular, about 85 percent of its students originating from low income households in the early 2000s landed careers that a decade after graduation put them in the top 20 percent income bracket.

Future enrollments at existing SMAs. Of the six existing SMAs as of 2016, four expected little growth in total cadet enrollments from current levels through 2025-2026. One projected a modest decline of about 42 cadets by 2025-2026 and one is projecting an increase of 191 cadets by 2025-2026. Overall, the six SMAs projected a net national increase of 149 enrolled cadets by 2025-2026. There will be a slight decrease (3 percent) in deck cadet enrollees and an 11.5 percent increase in engine cadets.[40]

The lack of robust projected enrollment growth, however, does not imply a belief among the SMAs that more cadets are not warranted by current or future demand for cadets.[41] Rather, SMA staff have reported that the primary constraint on enrollment growth is limited berth capacity on the existing training ships (Texas A&M Maritime Academy is the most restricted in this regard, and sends many of its cadets to other SMAs for sea time). They also have shore-side constraints related to facilities to accommodate student growth, including insufficient cadet housing and the need for additional faculty, simulators, labs, watercraft, and other items. SMAs are engaged in enrollment management efforts for these reasons and some would otherwise need to reduce enrollment without these efforts.

Coastal areas currently without an SMA**.** Three of the six existing SMAs and the USMMA are in the northeastern United States. Additionally, there is one SMA each on the West Coast, Great Lakes, and western Gulf Coast (see Figure 1). Although all these SMAs offer themselves as regional academies and offer out-of-state and regional tuition rates, there is evidence to suggest that SMAs may draw

[37] U.S. Department of Transportation, Budget Estimates Fiscal Year 2018: Maritime Administration, May 23, 2017, p. 46.
[38] Payscale, College ROI Report: Best Value Colleges, http://www.payscale.com/college-roi. See also Emmie Martin, "25 public colleges that are worth the money," CNBC, May 11, 2017, http://www.cnbc.com/2017/05/11/25-public-colleges-that-are-worth-the-money.html. Note that two of the six SMAs are not listed in the Payscale report because they are included as part of a larger institution.
[39] Phillip Reese, "Which California colleges help transform impoverished students into wealthy adults?", Sacramento Bee, January 24, 2017, http://www.sacbee.com/news/state/california/article128346494.html.
[40] Survey conducted for the Maritime Administration by Potomac Wave Consulting, Inc., 2016.
[41] Unless otherwise specified, information in this paragraph was collected in a survey commissioned by the Maritime Administration by Potomac Wave Consulting, Inc., 2016.

disproportionately from their home States and to a lesser extent, from adjacent States.[42] In-state tuitions at most of these academies are much lower than their out-of-state tuitions.

The States of the Southeastern United States are among the most removed geographically from existing SMA facilities. They have important maritime industries for which the ability to provide advanced maritime training to regional residents could be of economic benefit. They are also projected to sustain a significant coastal population from which candidates of a new SMA could be drawn. The population of those residents aged 15 to 34 years is expected to grow by 14 percent by 2035 in this region with a concentration in large urban centers, including in and around port cities.[43]

Figure 1: Locations of the existing SMAs and USMMA

Benefits and costs of a new SMA. The U.S. Government is not responsible for building State higher education institutions such as an SMA. That responsibility is vested with a State. The six SMAs that currently exist were established and funded by acts of State legislatures five or more decades ago. MARAD has statutory authority to provide only a limited amount of annual assistance to the SMAs. The State (or group of States) opting to establish a new academy would bear the great majority of the financial burden for doing so.

[42] The California Maritime Academy routinely publishes the percentage of its annual enrollment that consists of out-of-state U.S. students (16 percent in FY 2016: Source: Cal Maritime New Student Profile - Fall 2016, https://www.csum.edu/c/document_library/get_file?uuid=6372b87d-5e8f-435c-93c4-9a7ddfb3f892&groupId=6441462&filename=CSUM_Fall2016_New_Student_Profile.pdf). Texas A&M University at Galveston reported that 15 percent of its student body in 2010 was from out-of-state or international locations. Other academies do not appear to share this information publicly. Based on this information, citizens from coastal states without SMAs, including those States of the southeastern United States, have proportionally fewer opportunities for four-year maritime education, and at greater student expense, than do citizens from States with SMAs.

[43] Population Projections, United States, 2004 - 2030, by state, age and sex, on CDC WONDER Online Database, September 2005. Accessed at http://wonder.cdc.gov/population-projections.html on Jun 27, 2017 7:00:49 AM

Building, operating, maintaining, and staffing an SMA is expensive. A new maritime academy able to accommodate 900 students with faculty and staff could require 300,000 square feet of facilities, which, at a cost of $300 per square foot for construction, along with land acquisition costs, could exceed $100 million to build (higher costs are likely). California Maritime Academy, with 1,120 students of whom about 700 are cadets, has an annual operating budget of $44.1 million for 2016-2017, of which the State pays $28.9 million after recovering tuition and other revenues.[44] Seventy percent of California Maritime Academy's $44.1 million annual operating budget goes to personnel salaries and benefits.[45] The government of a State seeking to establish an SMA, or a local government within that State, would also pay the majority of start-up costs to build and establish the SMA. In most States, the cost of providing a large waterfront site for an academy could be very expensive.

Benefits to a State from building a new SMA would likely take the form of in-State students earning higher incomes after graduation, thereby contributing to the State's tax base and economy assuming those students remained in the State. The academic institution itself is an employer of highly-educated experts who contribute to the State's academic and technological resource base. Benefits to the Nation would also include economic benefits and the availability of trained professional mariners for sealift and economic purposes.

A detailed breakdown of full costs and benefits to States and the Federal Government of establishing an SMA (or other academic institution) is beyond the scope of this report, as it would be location-dependent, but would be similar in many ways to those that States must consider when establishing any public institution of higher learning. It is noteworthy that States with existing SMAs appear to remain strongly committed to them.

Risk of investment in new SMA. Much of this report is focused on potential means to secure an adequate base of sealift-qualified mariners in the near-term, whether by sustaining active mariners or by re-activating or upgrading mariners from pre-existing sources. Investment in a new SMA or other training programs is a commitment to a long-term supply of new sealift-qualified mariners.

Over the last several years, there has been a sharp increase in maritime industry interest and investment in the development of autonomous vessels (vessels that operate without, or greatly reduced, human crews onboard). Some industry experts believe that by 2025, some shipping companies in foreign countries will be operating remotely-controlled, autonomous vessels with no (or very minimal) crew on the high seas, and that five years beyond that, this could become more commonplace.[46] This is by no means a universal view, however, and maritime unions and other maritime experts are skeptical that these vessels will be safe.[47] It is possible, however, that the demand for mariners, both licensed and unlicensed, U.S. and foreign, operating vessels large and small, may

[44] California Maritime Academy, California State University Maritime Academy 2016-17 Budget Presentation, p. 19 of 21, https://www.csum.edu/c/document_library/get_file?uuid=3a66a548-c8e9-4457-b7bd-cad13a12603f&groupId=5226214
[45] California Maritime Academy, California State University Maritime Academy 2016-17 Budget Presentation, p. 15 of 21.
[46] Oskar Levander, "Forget Autonomous Cars—Autonomous Ships Are Almost Here," IEEE Spectrum, January 28, 2017, http://spectrum.ieee.org/transportation/marine/forget-autonomous-cars-autonomous-ships-are-almost-here
[47] Adam Minter, "Autonomous Ships Will Be Great: Doing away with sailors will make the high seas safer and cleaner," Bloomberg, May 16, 2017 https://www.bloomberg.com/view/articles/2017-05-16/autonomous-ships-will-be-great

begin to fall off at some point in the future. If so, the number of jobs requiring skillsets for sustaining autonomous vessel operations may not offset the number of jobs lost from moving to automation and increased integration of artificial intelligence in shipping operations.

States seeking to establish new SMAs should study the trend toward automation carefully before going forward. There would still be a demand for highly skilled officers to coordinate, operate, and maintain such vessels, but how many would be needed is uncertain. Curriculums might be modified in the future to accommodate skills required for "land-based" mariners.

Training ship needs. To earn USCG credentials with unlimited oceans endorsements, students must train and experience sea time on large oceangoing ships. The USMMA trains its students primarily on large privately-operated oceangoing commercial ships and, to a smaller extent, on board military vessels. But each of these ships typically accommodate only two cadets at a time. The approach favored by SMAs to provide training and sea time is to operate a training ship that can carry several hundred cadets at a time. Historically, the U.S. Government has provided training vessels to the SMAs as a means of facilitating this learning. The current training ships the Federal Government has loaned to the SMAs are converted cargo or Navy ships and are part of MARAD's National Defense Reserve Fleet. These U.S. Government-owned ships do not meet all of today's environmental regulations and several of them are now serving at ages near or beyond their designed service lives.

MARAD has been working for more than a decade to address the need to recapitalize the training ship fleet. Training ships are required to meet passenger ship safety and stability rules that are more stringent than rules for cargo ships. Converting a cargo ship to current passenger ship safety standards is very complicated, which increases the cost of conversion. Also, the U.S. Government no longer owns a surplus of vessels that could be converted to training ships, therefore, a ship would have to be procured for conversion, further increasing the conversion cost. Analysis shows that, of the various recapitalization options MARAD considered, new construction of a series of common-design training ships would be the best value to U.S. Government.[48]

Accordingly, MARAD recently developed a design and has received funding for two purpose-built training ships called National Security Multi-Mission Vessels (NSMV). The vessels will provide future merchant mariners with an effective platform for training with modern equipment. In addition, as has been demonstrated in recent years, training ships are also valuable platforms for berthing and supporting of first responders and recovery workers after natural disasters and to provide humanitarian assistance. The design of the NSMV therefore includes special features that further enhance the ability to support these events. On March 23, 2018, the President signed the Consolidated Appropriations Act of 2018 which appropriated $300 million to MARAD to fund the NSMV program and the construction of an NSMV. An additional $300 million for construction of second training ship was provided through the Fiscal Year 2019 Omnibus appropriation. MARAD is aggressively implementing this direction from Congress. On October 11, 2018, DOT/MARAD published a Request for Proposal for a Vessel

[48] DOT/Maritime Administration, "MARAD Training Ship Recapitalization Study Business Case Analysis," prepared by Volpe National Transportation Systems Center, July 21, 2015, p. 6.

Construction Manager (VCM) to deliver the NSMV.[49] Then in May of 2019, MARAD selected Tote Services, Inc. as the VCM to build up to 5 NSMV's, subject to available funding. TOTE will contract with a qualified shipyard to ensure that commercial best practices are utilized in delivering the NSMV on time and on budget. Delivery of the first NSMV is expected in 2022, with the second targeted for delivery the following year. The first of these two NSMVs will replace the EMPIRE STATE, the 57-year old training ship of the State University of New York Maritime College.[50]

[49] MARAD NSMV Vessel Construction Management (VCM), Solicitation Number: 693JF718R000029, FedBizOps.Gov, October 11, 2018, https://www.fbo.gov/index?s=opportunity&mode=form&tab=core&id=2c7965f51426d800631e56ff10553492&_cview=0.

[50] There is no guarantee, however, that the Federal Government will continue to provide support for new or existing training vessels nor is it implied that a new NSMV is the appropriate vessel for every SMA.

CONCLUSION

The United States depends on its merchant mariners to provide essential transportation services during war and peace. As discussed in this report, additional research is needed to validate the number of sealift-qualified mariners available to support DoD's needs during a prolonged national emergency while also maintaining concurrent peacetime-level commercial U.S.-flag shipping operations.

This report has highlighted numerous potential actions to improve accounting for and ensure a sufficient number of sealift-qualified mariners are available to meet the nation's economic and security needs. These potential actions include, but are not limited to, providing continued support to the commercial maritime industry during peacetime; working with other agencies and industry to assure that skilled mariners will have jobs during peacetime; developing better mariner databases; conducting surveys of mariners; expanding or establishing a new mariner reserve program; creating programs to reactivate and upgrade mariner credentials; and undertaking other initiatives to encourage mariners to be available and willing to sail during emergencies. Among potential actions aimed at the long-term development of qualified mariners is the establishment of one or more new State Maritime Academies, depending on State willingness to establish such institutions.

None of the potential actions discussed in this report should be construed as recommendations or as establishing official policy or commitments for the United States Department of Transportation, the Maritime Administration, or the Administration.