Vulnerabilities in MARAD’s NSMV Program Management May Hinder Efficient Achievement of Program Goals
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Self-Initiated
Maritime Administration | ZA2021021 | March 2, 2021

What We Looked At
The Maritime Administration (MARAD) provides ships from the National Defense Reserve Fleet as training vessels for cadets at the State maritime academies to become licensed mariners. In fiscal year 2015, MARAD began the design of National Security Multi-Mission Vessels (NSMV) to replace five training ships nearing the end of useful life. Congress directed MARAD to use an entity other than itself to contract for NSMV construction using commercial design standards and construction practices and has thus far appropriated approximately $1.3 billion for the NSMV program. Given this significant investment and MARAD’s support of national security, we initiated this audit. Our objective was to assess MARAD’s management of the NSMV Program, including oversight of the vessel construction manager (VCM) contract and use of commercial design standards and commercial construction practices consistent with the best interests of the Federal Government.

What We Found
Vulnerabilities in MARAD’s NSMV program management may hinder achievement of program goals. Though it has taken some risk mitigation steps, MARAD’s program risk management is inadequate. Its risk assessment lacked complete analysis of important elements such as individual risk likelihood, consequences, and mitigation strategies. It also does not sufficiently update and monitor program risks. These deficiencies could affect the Agency’s ability to achieve timely and cost-effective vessels that meet its needs. Furthermore, MARAD has not reviewed complete versions of three required oversight plans that describe key areas of the VCM’s strategy for managing and overseeing NSMV design and construction. Incomplete plans impede MARAD’s ability to effectively oversee the VCM. Lastly, delays in the VCM contract and shipyard subcontract awards may increase MARAD’s exposure to program risks. Later-than-planned awards reduced the time between first vessel delivery and placement into service from 17 months to 1. This lost cushion increases the possibility that the VCM and shipyard will not have enough time to address issues and that contingency plans for late vessel delivery will be implemented, thus adding cost to the program’s billion-plus dollar investment.

Our Recommendations
MARAD concurred with both recommendations to improve its management of the NSMV Program.

All OIG audit reports are available on our website at www.oig.dot.gov.
For inquiries about this report, please contact our Office of Government and Public Affairs at (202) 366-8751.
Memorandum

Date: March 2, 2021

Subject: INFORMATION: Vulnerabilities in MARAD’s NSMV Program Management May Hinder Efficient Achievement of Program Goals | Report No. ZA2021021

From: Mary Kay Langan-Feirson
Assistant Inspector General for Acquisition and Procurement Audits

To: Maritime Administrator

As the Department of Transportation (DOT) Agency responsible for America’s waterborne transportation system, the Maritime Administration (MARAD) provides ships from the National Defense Reserve Fleet as training vessels for the six State maritime academies. These training ships provide the means for academies’ cadets to become licensed mariners. As such, the ships play an important role in keeping the Nation’s shipping industry competitive while maintaining national defense and disaster response capabilities.

In fiscal year 2015, MARAD began the design for the National Security Multi-Mission Vessels (NSMV) to replace five of the State academies’ training ships that are nearing the end of their useful lives and need costly repairs to remain safe and in service.¹ NSMVs are to provide state-of-the-art training platforms that ensure that the United States continues to set the standard in maritime training. NSMVs will also support Federal efforts to respond to national and international disasters and other critical national needs.

Thus far, Congress has appropriated approximately $1.3 billion for NSMV design and construction. In the fiscal year 2017 National Defense Authorization Act (NDAA),² Congress directed MARAD to use an entity other than itself to contract for NSMV construction and to build the vessels using commercial design standards and commercial construction practices³ consistent with the best interests of the Federal Government.

¹ According to the NSMV Acquisition Plan, the sixth training ship—TS State of Michigan—is not in need of replacement and provides sufficient capacity.
³ Throughout this document, we will refer to “commercial design standards and commercial construction practices” as “commercial practices.”
Given this significant financial investment and MARAD’s role in support of national security, we initiated this audit. Our audit objective was to assess MARAD’s management of the NSMV Program, including oversight of the vessel construction management contract and use of commercial design standards and commercial construction practices consistent with the best interests of the Federal Government.

We conducted this audit in accordance with generally accepted Government auditing standards. Exhibit A details our scope and methodology, exhibit B lists the organizations we visited or contacted, and exhibit C lists the acronyms used in this report.

We appreciate the courtesies and cooperation of Department of Transportation representatives during this audit. If you have any questions concerning this report, please call me at (202) 345-2619, or Jill Cottonaro, Program Director, at (202) 366-3831.

cc: The Secretary
DOT Audit Liaison, M-1
MARAD Audit Liaison, MAR-392
Results in Brief

Vulnerabilities in MARAD’s NSMV program management may hinder efficient achievement of program goals.

The program management vulnerabilities facing MARAD include the following.

**MARAD’s management of NSMV program risks is inadequate.** Although MARAD has taken some steps to mitigate risks for its NSMV program—including use of commercial practices as Congress directed—its overall management of program risks is inadequate. Specifically, MARAD’s NSMV program risk assessment—which was done before the vessel construction manager’s (VCM) contract was awarded—lacked complete analysis of risk elements such as individual risk likelihood, consequences, and mitigation strategies—a best practice according to the Department of Defense’s (DoD) guidance\(^4\) for managing major program risks. Furthermore, the Agency is not sufficiently updating and monitoring risks as the program progresses; instead, it relies on the VCM periodic risk assessments and quarterly updates, which are limited in scope. These risk management deficiencies inhibit MARAD’s ability to develop and implement effective mitigation strategies and focus resources on the greatest risks to the program’s success. Furthermore, these deficiencies may ultimately affect the Agency’s ability to achieve timely, cost-effective vessels that meet its needs.

**MARAD has not reviewed complete versions of three required VCM oversight plans.** As part of its contractual agreement, the VCM is required to deliver plans which MARAD program officials must then review and approve. However, MARAD has not reviewed complete versions of three required oversight plans that describe key areas of the VCM’s strategy for managing and overseeing NSMV design and construction.\(^5\) Specifically, the VCM provided MARAD with plans that are missing details on the VCM’s oversight of vessel design and construction and have several sections marked “to be determined.” Although these plans are required deliverables per the terms of the VCM contract, MARAD did not set a requirement for when the VCM was to deliver complete plans. Instead, MARAD officials allowed the VCM to determine when it will provide the complete plans and MARAD accepted the dates. Furthermore, the delivery dates for completed plans are not enforceable and therefore could shift without consequence to the VCM. The current lack of complete oversight

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\(^4\) DoD, *The Department of Defense Risk, Issue, and Opportunity Management Guide for Defense Acquisition Programs*, January 2017. While this guide is not a requirement, it provides best practices relevant to the NSMV Program because the NSMVs’ scope and complexity are comparable to some DoD shipbuilding programs.

\(^5\) These three plans are the Configuration, Design, and Technical Management Plan; Quality Assurance, Risk Management, and Metrics Plan; and Test and Evaluation Approach plan.
plans impedes MARAD’s ability to effectively oversee the VCM. It also limits the Agency’s ability to assess the VCM’s intended oversight strategies to ensure commercial practices are used and that the NSMVs will be delivered on time and in conformance with requirements.

**Delays in contract awards may increase program risks.** MARAD expressed to congressional stakeholders⁶ that it recognizes the importance of efficient NSMV delivery due to the short remaining service lives of the current training ships and the role these vessels play in our national security. However, delays in the VCM contract and shipyard subcontract awards may increase MARAD’s exposure to program risks. Specifically, the later-than-planned awards have reduced the time or “cushion” between first vessel delivery and placement into service from 17 months to 1. Therefore, MARAD lost a 16-month cushion period should any unforeseen issues or missteps arise during vessel construction and testing. Consequently, the possibility increases that the VCM and shipyard may not have time to adequately address unexpected issues, and that MARAD will not be able to issue the acceptance certificate prior to the May 2023 in-service date it reported to congressional stakeholders. As a result, MARAD’s risk of having to activate its contingency plans for late vessel delivery also increases—which may require additional Agency funding beyond its billion-plus dollar investment in the program.

We made recommendations to strengthen MARAD’s NSMV program management to support efficient achievement of program goals. MARAD concurred with both recommendations.

### Background

Section 3505 of the fiscal year 2017 NDAA directs MARAD to use an entity other than itself to contract for NSMV construction and requires the use of commercial design standards and commercial construction practices consistent with the best interests of the Federal Government.

The NDAA does not explicitly define “best interests of the Federal Government.” However, based on the statement of guiding principles contained in the regulations applicable to the Federal Acquisition System,⁷ the intent for this language could be interpreted to include principles common to the Government’s best interest when acquiring goods and services—such as meeting the stated need at the quality expected, on time, and within a reasonable cost.

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⁶ MARAD provided these details in a July 2018 email to Senate staff in response to questions about the NSMV program.

⁷ Federal Acquisition Regulation (FAR) 1.102.
According to the Government Accountability Office (GAO), commercial practices in shipbuilding generally lead to delivery of ships on time and within budget by employing shipbuilding methods that are not historically used in Navy shipbuilding.\(^8\) Commercial shipbuilding practices include

- prior to contract award—retirement of all major risk and a full understanding of efforts needed to design and construct a ship, thus allowing the builder to sign a contract that fixes price, delivery date, and ship performance parameters;

- prior to start of construction—completion of design phases that correspond with the completion of a three-dimensional product model;

- the shipyard’s development of an in-depth understanding of new technologies included in the ship design;

- use of a disciplined construction process that minimizes change orders, which can cause delays and increase costs; and

- the buyer’s, such as MARAD, establishment of a presence at the shipyard and key suppliers’ locations to ensure a ship meets quality expectations and is delivered on schedule.

In May 2019, MARAD awarded an indefinite delivery/indefinite quantity contract for VCM services with a $1.75 billion ceiling—from which fixed-price task orders would be issued for shipyard selection, management, and oversight of the vessels’ design and construction. In April 2020, the VCM awarded a $630 million subcontract to a shipyard for the construction of two NSMVs, with options for the construction of up to three more. Per the subcontract, the first two ships are to be delivered to MARAD in the spring of 2023 and winter of 2024. The VCM estimates that full-scale construction of the first vessel will start in April 2021, since the VCM and shipyard are still finalizing the design and ordering parts and equipment. See figure 1 for a timeline of NSMV Program milestones.

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\(^8\) GAO, *High Levels of Knowledge at Key Points Differentiate Commercial Shipbuilding from Navy Shipbuilding* (GAO-09-322), May 2009.
Figure 1. NSMV Program Milestones

Source: OIG analysis

Under the VCM acquisition approach being used to meet the NDAA requirement, MARAD, the VCM, and the shipyard all have specific roles and responsibilities to help achieve NSMV program goals (see figure 2).
This acquisition approach implements Congress’ direction to have an entity other than MARAD contract for the NSMVs’ construction. Although MARAD is responsible for overseeing the VCM contract, this congressionally-mandated approach intentionally and significantly reduces MARAD’s role in day-to-day oversight of NSMV construction. The VCM contract also expressly disclaims any contractual relationship between MARAD and the shipyard, and consequently, any Agency liability to the shipyard. This acquisition approach does not allow MARAD to have direct oversight of the shipyard, leaving primary responsibility for the day-to-day management of the shipyard and other subcontracts involved in NSMV construction with the VCM. However, MARAD does have the right to inspect the shipyard and vessels to assess the VCM’s compliance with contract requirements. If MARAD oversteps its limited role and exercises day-to-day supervision and control over the shipyard, or circumvents the VCM’s independent
authority, the Agency runs the risk of potential shipyard claims for losses or damages.⁹

Vulnerabilities in MARAD’s NSMV Program Management May Hinder Efficient Achievement of Program Goals

Although MARAD has taken steps to mitigate risks and limit its liability for the NSMV program—including use of commercial practices—vulnerabilities in its program management may affect timely and cost-effective vessel delivery. Specifically, MARAD’s management of NSMV program risks is inadequate. The Agency also has not reviewed complete versions of three required VCM plans that include key details on how the VCM will manage and oversee various areas of vessel design and construction. Finally, delays in awarding both the VCM contract and shipyard subcontract may increase MARAD’s risks for the program.

MARAD’s Management of NSMV Program Risks Is Inadequate

While MARAD has implemented an acquisition approach that mitigates risk and shifts day-to-day management of vessel construction to a VCM as Congress intended, the Agency remains responsible for overall NSMV program management and stewardship of program funds. As a result, a critical element of MARAD’s program management is its risk assessment and monitoring since they could affect achievement of program goals. Risk management is particularly critical because MARAD has a significant investment in the NSMV program and has never used a VCM acquisition approach to procure ships. MARAD has taken some positive steps to mitigate several program risks. However, vulnerabilities in MARAD’s overall management of program risks could impede the Agency’s achievement of NSMV program goals. Specifically, MARAD’s risk assessment for the program is incomplete, and the Agency is not sufficiently updating and monitoring risks as the program progresses.

DoD’s Risk, Issue, and Opportunity Management Guide for Defense Acquisition Programs states that, as a best practice for major program management, risk analysis is to provide an estimate of each risk’s likelihood, consequence, and

resulting level in order to manage risks and prioritize mitigation efforts. Program officials use these elements to determine a risk level for each individual risk. Program personnel can then develop mitigation strategies to manage risks that include details on what is to be done; when it should be accomplished; who is responsible; the resources required; and the resulting impact on cost, schedule, and performance. Program personnel are to regularly update and monitor risks for changes, which can be done using a risk register. The DoD Guide calls for program officials to develop a risk register as early as possible. While these best practices are not commercial ship-building requirements, they represent practical and established steps for understanding, anticipating, and mitigating major program risks before they become issues.

Although MARAD conducted a program risk assessment prior to awarding the VCM contract, this assessment did not include DoD risk management best practices. Specifically, MARAD did not conduct an analysis of the likelihood and consequences of identified risks. Furthermore, MARAD program officials did not develop strategies to mitigate all identified risks. Finally, MARAD did not always identify individual risks but instead, used general risk categories without defining exactly what it evaluated under each category. For example, in its risk assessment, MARAD set the risk level of the program’s general technical risk category as low because the NSMVs’ design development would be at an advanced stage before MARAD actually awarded the VCM contract. However, in the assessment, MARAD did not specifically identify what it evaluated to arrive at a low risk rating for the general technical risk category. Furthermore, MARAD did not include any analyses of specific risks’ likelihoods and consequences nor did it identify any criteria used to determine the overall low risk level for this category.

Moreover, MARAD has not established a risk register or other method to update and monitor risks as the program progresses. Instead, program officials rely on the VCM’s periodic risk assessments that are required as a deliverable on the Quality Assurance, Risk Management, and Metrics Plan and on updates provided at quarterly program management review meetings. While MARAD states that the VCM maintains a risk register, this register focuses on risk in shipyard performance and vessel construction, not achievement of overall NSMV program goals. Assessing and monitoring program-level risks are part of MARAD’s responsibility for overall program management. For example, MARAD officials told us the Agency has received funding for ship sharing to offset the shortfall in training ship capacity. However, it may encounter additional costs associated with implementing contingency training plans if a vessel is not ready by its expected date or does not meet the Agency’s requirements. The VCM’s performance impacts this risk, but the vessels and the training that is to take place on them ultimately fall under MARAD’s program management responsibility.

These shortfalls in MARAD’s management of NSMV program risks can be attributed to the fact that the Agency does not have a defined process for
assessing and monitoring program risks, including complete analysis, mitigation planning, and regular updating. MARAD officials state that the Agency is in the process of designing and finalizing a Risks, Issues, and Opportunities (RIO) Management Program based on DoD’s guidance and other Government and industry resources and best practices. MARAD officials further state that the program will serve as the governing document for executing RIO management policies and processes for the NSMVs. The RIO Management Program will also provide a risk management process using the three-tiered reporting approach—shipyard to VCM to MARAD—and as much data as possible for making informed program management decisions.

While inadequacies in MARAD’s program risk management exist, the Agency has taken steps—including the use of commercial practices throughout the NSMV design process—to mitigate program risk. For example:

- MARAD contracted with an experienced marine design firm in 2015 and gathered requirements from the Maritime Academies, Navy Military Sealift Command, and Naval Sea System’s Command to develop the NSMVs’ concept design prior to awarding the VCM contract. This enabled MARAD to include design requirements in the contracts and minimize the likelihood of disruptive change orders once vessel construction begins, since MARAD, the VCM, and the shipyard must coordinate on all significant changes to the contracted design.

- MARAD used firm fixed price orders under the VCM contract, thus establishing vessel costs and delivery dates when the orders are signed, which shifts cost and schedule risk away from MARAD to the VCM. In addition, the contract is structured to hold the VCM liable for final vessel deliveries and any defects in NSMV performance that are traceable back to the contracted design requirements.

- MARAD is using the marine design firm as an additional oversight resource during vessel design refinement and construction. The firm’s engineers will advise MARAD on technical and quality assurance issues. MARAD officials are also in the process of hiring two experienced vessel construction specialists as assistant contracting officer representatives who will be stationed at the shipyard throughout NSMV construction.

- MARAD contracted with a law firm experienced in commercial shipbuilding to advise it on the VCM contract solicitation, shipyard selection, and execution of a Credit Enhancement Agreement to address concerns over the shipyard’s solvency issues. This agreement includes provisions that restrict the shipyard from making financial distributions to its affiliated companies and spending its cash reserves for purposes unrelated to NSMV construction without the VCM’s approval. It also
includes a requirement for the shipyard’s parent company to guarantee the shipyard’s contract obligations and execute a memorandum of understanding among relevant parties to support completion of the NSMV program if the shipyard defaults on the subcontract. The agreement also requires quarterly reporting of financial information and management of a reserve fund.

Despite these positive steps, MARAD’s lack of a defined risk management process inhibits its ability to develop and implement strategies to effectively mitigate program risks and focus resources on the greatest risks to the program’s success. Furthermore, incomplete and outdated risk analyses could leave the program vulnerable to issues that impede the timely delivery of cost-effective vessels that meet the Agency’s requirements.

### MARAD Has Not Reviewed Complete Versions of Three Required VCM Oversight Plans

According to the FAR,\(^\text{10}\) agencies must perform quality assurance assessments on contractor deliverables and ensure that the deliverables meet contract requirements. As part of the contractual agreement, the VCM is required to deliver plans to MARAD, including how it will manage and oversee NSMV design and construction. Agency officials must then review and approve these plans as part of their contract administration.

MARAD has not, however, reviewed complete versions of three required oversight plans that describe key areas of the VCM’s strategy for managing and overseeing NSMV design and construction. These three plans are the Configuration, Design, and Technical Management Plan;\(^\text{11}\) Quality Assurance, Risk Management, and Metrics Plan;\(^\text{12}\) and Test and Evaluation Approach plan.\(^\text{13}\) MARAD reviewed incomplete versions of these three oversight plans as received from the VCM. However, the incomplete plans are missing details on the VCM’s oversight of vessel design and construction and have several sections marked as “to be determined.” For example:

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\(^{10}\) FAR 46.102(b) and (c).

\(^{11}\) This plan covers requirements for design change activities and the elements and deliverables for vessel design, construction, and delivery.

\(^{12}\) This plan covers the internal controls for quality and program measures the VCM will employ to keep MARAD informed of the progress and changes to vessel design, construction, and other activities.

\(^{13}\) This plan provides the overall process for testing and evaluating the NSMVs to ensure all performance requirements and measurements are met, verified, and validated.
• the Configuration, Design, and Technical Management Plan is missing detail on the shipyard’s process for obtaining an approved list of equipment, including items that must be ordered early in the construction process to avoid interruptions and delays;

• the Quality Assurance Risk Management and Metrics Plan does not detail a process for (1) identifying and documenting risks; (2) analyzing, prioritizing, and assigning risks to the entity responsible for their mitigation and closure; or (3) reporting conformance and non-conformance with design specifications identified at various stages of construction; and

• the Test and Evaluation Approach plan is missing elements for testing and evaluating strategies, such as the integrated test program schedule and testing methodologies, and how the VCM will report deficiencies while testing.

While these plans are required deliverables per the terms of the VCM contract, MARAD did not establish a date by which the VCM must deliver the complete plans. MARAD set a date only for the VCM’s delivery of the plans’ initial versions. Program officials explained that these initial versions were incomplete because to complete them, the VCM had to collaborate with the shipyard. Yet, this could not occur because the shipyard contract was not awarded prior to the contractually required delivery dates. However, after the VCM awarded the shipyard contract, MARAD still did not establish a due date for the submission of the complete plans. As a result, during our audit, MARAD officials kept shifting the timeframe when they expected to receive the VCM completed plans.

Specifically, MARAD officials first reported that the VCM would complete its oversight plans after it awarded the shipyard subcontract, which occurred in April 2020. They then stated that the VCM would complete the plans in January 2021, after the shipyard receives its International Standards Organization (ISO) 9001 certification.14 Most recently, Agency officials informed us that the VCM proposed delivery dates for the plans in the November 2020 version of the integrated master schedule15—December 25, 2020, February 10, 2021, and April 13, 202116—and that they have accepted these dates.

14 ISO 9001 is a professional standard that sets requirements for quality management systems and requires organizations to define their quality objectives and continually improve their processes to reach them.

15 The shipyard prepares the integrated master schedule and an updated version is submitted to MARAD by the VCM each month as a recurring contract deliverable. The schedule presents time-based events detailing the tasks required to accomplish design, construction, delivery, and guarantee of the NSMVs.

16 The December and February dates occurred after our draft report was issued and audit work was completed. Per MARAD’s comments to our draft report, the Agency is in the process of completing its review of these plans.
These proposed submission dates all fall prior to the estimated full-scale construction start date of April 26, 2021. However, the Quality Assurance, Risk Management, and Metrics Plan is scheduled for submission less than 2 weeks prior to this start date, leaving minimal time for MARAD to review and approve the plan—particularly if adjustments are needed. Furthermore, the integrated master schedule is a living document that the shipyard updates and the VCM provides to MARAD on a monthly basis. Therefore, the dates reported in it represent a moving target and may change in subsequent versions.

Program officials explained that these oversight plans are working documents since some of the matters they contain are based on actions that have not been finalized yet—such as the material and equipment list. However, initial construction activities, such as pilot block cutting, were estimated to start by the end of December 2020, and full-scale construction in April 2021. As a result, the lack of complete oversight plans impedes MARAD’s ability to effectively oversee the VCM. It also limits the Agency’s ability to assess the VCM’s intended oversight strategies to ensure commercial practices are used and that the NSMV will be delivered on time and in conformance with requirements.

Delays in Program Contract Awards May Increase MARAD’s Program Risk

As the customer and funding source for the NSMV, MARAD is ultimately responsible for managing the NSMV program in the best interests of the Federal Government. In its fiscal year 2018 correspondence to congressional stakeholders, MARAD has recognized the importance of efficient NSMV delivery due to the short remaining service lives of the current training ships. MARAD also stated that a lack of replacement vessels for existing ships when they become unserviceable will reduce training capacity for new merchant mariners by 36 percent. Despite MARAD’s efforts to reduce contract cost, schedule, and performance risk through the establishment of contractual vessel delivery dates and fixed-price orders, and the VCM’s liability for both, MARAD is not without NSMV program risks.

Delays in the VCM contract and shipyard subcontract awards have increased MARAD’s program risks. Specifically, as part of its initial program planning, MARAD targeted its award of the VCM contract for December 2018, and delivery of the first vessel 36 months later in December 2021. However, MARAD did not

17 This estimated start date for full-scale construction is based on the integrated master schedule dated November 2020.
18 MARAD’s July 2018 email to Senate staff.
award the VCM contract until May 2019—5 months later than planned— which resulted in pushing the estimated delivery date of the first vessel from December 2021 to September 2022. Additional delays occurred because it took longer than MARAD expected for the VCM to award the shipyard subcontract. The shipyard subcontract was awarded in April 2020, and the delivery date of the first vessel was pushed to April 2023. While MARAD officials maintain that these contract award delays did not affect the production schedule timeframe, the delays did reduce the time or “cushion” between the first vessel’s required delivery and when it goes into service from 17 months to 1 month—a loss of 16 months. Consequently, MARAD will have 1 month to ensure the first NSMV will be ready for the May 2023 training cruise—the date MARAD reported to congressional stakeholders (see figure 3).

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19 MARAD program officials stated the delay in the VCM contract award occurred because it took longer than expected for them to finalize the Request for Proposal, and they extended the response due date to allow offerors to develop and submit well-prepared proposals. MARAD’s proposal evaluation also took longer than expected because officials held discussions with offerors in the competitive range.

20 According to MARAD program officials, the delay in the VCM’s award of the shipyard subcontract occurred because of negotiations, including over the awardee’s solvency issues.
Because of the delayed contract awards, MARAD has lost the 16-month cushion to protect itself should any unforeseen issues arise during vessel construction and testing. Moreover, once the vessel is delivered, Agency program officials must conduct a walkthrough to verify that nothing has changed from its final pre-delivery inspection when they reviewed the VCM’s testing, inspections, and trials to determine whether the vessel meets all contract requirements. If nothing has changed, MARAD officials will execute the acceptance certificate for the vessel. As such, the reduced time cushion between vessel delivery and in-service date increases the possibility that the VCM and shipyard will not have time to adequately address unforeseen errors and issues and that MARAD will be unable to issue the acceptance certificate prior to the May 2023 in-service date.

Furthermore, the reduced time cushion between vessel delivery and its in-service date also increases the risk of MARAD having to activate the Agency’s contingency plan, which could result in increased operating and maintenance costs. The Agency has contingency plans to mitigate the risk of late vessel delivery that include extending the lives of current ships by upgrading or replacing equipment and/or activating ship sharing plans among the academies. However, MARAD’s need to activate these plans may come at additional cost to
the billion-plus dollar program because cadets and vessels may need to be relocated. Extending the service lives of the existing training ships could also increase costs. In their fiscal year 2018 correspondence to congressional stakeholders, MARAD officials stated that extending the service lives of the old vessels would result in increased operating and maintenance costs and risk to cadet safety.

MARAD has taken some steps—including its use of commercial practices—to protect against certain schedule and cost risks to the program. The use of firm fixed price orders and a Credit Enhancement Agreement with the shipyard to address solvency issues may help mitigate both risks. MARAD also requires the VCM to provide an updated integrated master schedule each month with a detailed timeline of milestones and events, both for itself as the prime contractor, and for its subcontractors. Furthermore, the VCM contract includes a liquidated damages clause that allows MARAD to assess daily financial penalties to the VCM for late vessel deliveries. Additionally, MARAD makes progress payments to the VCM for vessel construction only when contractually set milestones are achieved, thus increasing the incentive for the VCM and the shipyard to keep NSMV production on schedule. Finally, MARAD officials also have full-time access to the online information system where the VCM stores program documentation, tracking data, and correspondence.

MARAD’s use of these strategies and tools can help provide diligent program management to support timely and cost-effective vessel delivery. These tools can also help the Agency identify issues that could disrupt vessel delivery per the contract terms, and inform its decision on whether to award the VCM contract options for the three remaining vessels. Specifically, the contract provides a lower cost for each of the three remaining vessels if the Agency exercises the options for the vessels within dates specified in the VCM contract. To receive the discounted rate, MARAD must agree to exercise the options for the three remaining NSMVs by July 2, 2021, December 29, 2021, and June 27, 2022—all dates prior to the first NSMV’s completion. Therefore, MARAD’s timely decision on the options—along with receipt of the necessary funding from Congress—could reduce the total cost of the remaining three vessels by $53.6 million. Diligent program management is critical in order for the Agency to make informed option decisions.

Because full-scale construction did not begin during the course of our review, we could not evaluate the effectiveness of MARAD’s processes and controls to monitor construction progress. Successful delivery of the NSMVs in a timely and cost-effective manner depends on MARAD’s vigilant monitoring of program cost, schedule, and performance.
Conclusion

As the NSMVs play a key role in advancing the development of future merchant marine officers and supporting disaster response and other critical national needs, it is essential that the NSMV program is managed in the best interest of the Government. Congress has appropriated approximately $1.3 billion dollars for this important program thus far, with future multi-million dollar appropriation(s) anticipated. However, vulnerabilities in MARAD’s management practices—including inadequate assessment of program risks as well as heightened risks due to contract award delays—may ultimately impede the Agency’s achievement of program goals in the best interests of the Federal Government.

Recommendations

To improve MARAD’s management of the NSMV Program, we recommend that the Maritime Administrator:

1. Document and implement a risk management process to analyze program risk, including risk identification, likelihood and consequence, mitigation strategy, and monitoring activities. This documented process should also include steps for monitoring, tracking, and updating risks throughout the life of the program. This recommendation should be completed prior to the start of full-scale vessel construction.

2. Obtain, review, and approve complete versions of each of the following VCM oversight plans: the Configuration Design and Technical Management Plan; Quality Assurance, Risk Management, and Metrics Plan; and Test and Evaluation Plan. This recommendation should be completed prior to the start of full-scale vessel construction.
Agency Comments and OIG Response

We provided MARAD with our draft report on December 18, 2020, and received its formal response on February 5, 2021. MARAD’s response is included in its entirety as an appendix to this report. MARAD concurred with both of our recommendations as written and provided appropriate completion dates.

Actions Required

We consider both recommendations 1 and 2 resolved but open pending completion of MARAD’s planned actions.
Exhibit A. Scope and Methodology

We conducted this performance audit between February 2020 and December 2020 in accordance with generally accepted Government auditing standards as prescribed by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective.

Our audit objective was to assess MARAD’s management of the NSMV program, including Agency oversight of the VCM contract and the use of commercial design standards and commercial construction practices consistent with the best interests of the Federal Government. This audit was conducted prior to the start of vessel construction.

To address our audit objective, we reviewed applicable sections of the FAR, commercial design and shipbuilding best practices and relevant reports, DoD risk management guidance, and contractual and programmatic NSMV documentation that MARAD provided. We then analyzed program documents, also provided to us by MARAD—including the VCM contract, shipyard subcontract, business case analysis, acquisition plan, independent Government cost estimate, oversight plans, and integrated master schedules—to evaluate MARAD’s program management and the extent to which commercial practices are being used.

We interviewed representatives from MARAD’s Contracting Office and NSMV Program Office at DOT Headquarters to learn the Agency’s program management roles and responsibilities, and their risk management and price reasonableness processes. We also used these interviews to clarify and validate our analysis of program documentation.

We also interviewed the VCM’s Vice President of Marine Services and Legal Counsel via teleconference to understand the management and oversight processes of NSMV construction, including details on interactions with MARAD throughout the vessel design and construction process. Furthermore, we inquired about the VCM’s experience with Government shipbuilding, the VCM acquisition approach, and its use of commercial practices. We spoke via teleconference to officials with the Shipbuilders Council of America to gain a better understanding of the VCM acquisition approach and general shipbuilding commercial practices. These interviews helped us verify the accuracy of the best practices documents we researched and analyzed.
Finally, we used the expertise of an OIG engineer throughout our audit work. The engineer participated in audit meetings, met and coordinated with MARAD technical representatives, assisted with our review of programmatic documents, and provided an expert opinion on technical aspects of the program.
Exhibit B. Organizations Visited or Contacted

OA Facilities

Maritime Administration (MARAD)

Other Organizations

Shipbuilders Council of America

TOTE Services, Inc.
**Exhibit C. List of Acronyms**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DoD</td>
<td>Department of Defense</td>
</tr>
<tr>
<td>DOT</td>
<td>Department of Transportation</td>
</tr>
<tr>
<td>FAR</td>
<td>Federal Acquisition Regulation</td>
</tr>
<tr>
<td>GAO</td>
<td>Government Accountability Office</td>
</tr>
<tr>
<td>ISO</td>
<td>International Standards Organization</td>
</tr>
<tr>
<td>MARAD</td>
<td>Maritime Administration</td>
</tr>
<tr>
<td>NDAA</td>
<td>National Defense Authorization Act</td>
</tr>
<tr>
<td>NSMV</td>
<td>National Security Multi-Mission Vessel</td>
</tr>
<tr>
<td>OIG</td>
<td>Office of Inspector General</td>
</tr>
<tr>
<td>RIO</td>
<td>Risks, Issues, and Opportunities</td>
</tr>
<tr>
<td>VCM</td>
<td>vessel construction manager</td>
</tr>
</tbody>
</table>
**Exhibit D.** Major Contributors to This Report

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>JILL COTTONARO</td>
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</tr>
<tr>
<td>AARON MALINOFF</td>
<td>PROJECT MANAGER</td>
</tr>
<tr>
<td>JAY SWARTZBAUGH</td>
<td>PROJECT MANAGER</td>
</tr>
<tr>
<td>JERRI BAILEY</td>
<td>SENIOR AUDITOR</td>
</tr>
<tr>
<td>ANDREW JAMES</td>
<td>SENIOR ANALYST</td>
</tr>
<tr>
<td>ANGELA HAILES</td>
<td>SENIOR ANALYST</td>
</tr>
<tr>
<td>SUSAN NEILL</td>
<td>WRITER-EDITOR</td>
</tr>
<tr>
<td>CELESTE BORJAS</td>
<td>ASSOCIATE COUNSEL</td>
</tr>
<tr>
<td>ANNE-MARIE JOSEPH</td>
<td>ENGINEERING SERVICES MANAGER</td>
</tr>
</tbody>
</table>
Appendix. Agency Comments

Memorandum

U.S. Department of Transportation
Maritime Administration

Date: February 5, 2021

From: Kevin M. Tokarski
Associate Administrator for Strategic Sealift

To: Mary Kay Langan-Feirson
Assistant Inspector General for Acquisition and Procurement Audits


The Maritime Administration (MARAD) is committed to ensuring that the National Security Multi-Mission Vessel (NSMV) Program, a long-awaited recapitalization effort for the five-aged school ship training vessels, fully complies with the requirements of the Program Management Improvement and Accountability Act (PMIAA). In the Fiscal Year (FY) 2017 National Defense Authorization Act (NDAA), Congress directed MARAD to use an entity other than itself to contract for NSMV construction and to build the vessels using commercial design standards and commercial construction practices consistent with the best interests of the Federal Government. As stewards of taxpayer dollars, MARAD is conducting rigorous risk management and program oversight of the NSMV Program to deliver the capabilities on time and at firm fixed cost.

MARAD has several efforts underway to further enhance its management and oversight of the NSMV program to include the following:

- Developing and finalizing an Agency-specific Risks, Issues, and Opportunities Management Program;

- Completing a review of oversight plans provided by MARAD’s contracted Vessel Construction Manager (VCM), which consists of the Configuration Design and Technical Management Plan; Quality Assurance, Risk Management, and Metrics Plan; and Test and Evaluation Plan;
• Mitigating full-scale vessel construction schedule risk by supporting a Pilot Block production program prior to the start of construction which evaluates workforce training and the effectiveness of shipyard and Quality Assurance/Quality Control processes; and

• Continuing to recruit and hire personnel with the requisite experience, skills and training as the program grows in ship orders.

Upon review of the OIG’s draft report, MARAD offers two major clarifications as follows:

• It is important to note the distinction between commercial and Department of Defense (DOD) shipbuilding, risk management and/or program oversight guidance applicability. In executing management and oversight of the NSMV program in compliance with the Fiscal Year 2017 NDAA, MARAD references DOD, other Government Agency, and industry guidance resources as best practices, not requirements.

• Any delays in MARAD’s awarding of the VCM prime contract (or shipyard subcontract) have not significantly delayed MARAD’s overall schedule or increased the financial risks for the program. Although there was added risk of missing the FY 2023 summer training cruise, the contract improvements MARAD sought significantly reduced risk to cost, schedule and performance.

  • Relative to schedule risk, schedule should not be measured from dates reported to Congressional stakeholders since those notional dates did not include the actual prime contract information. To provide meaningful program management metrics, when the prime contract was awarded, the program was re-baselined to include actual schedule. This is the baseline used today to gauge overall schedule success.

  • Relative to financial risk, MARAD requested and has been funded for training ship sharing through FY 2021 to offset the long-standing shortfall in training ship capacity. If meeting the FY 2023 summer training cruise becomes jeopardized, ship sharing options may remain available, and could be managed by requesting additional resources.

MARAD concurs with the two recommendations as written. We plan to complete actions to implement both recommendations by April 26, 2021, the planned start of full-scale vessel construction.
We appreciate the opportunity to respond to the OIG draft report. Please contact me at 202-366-2629; kevin.tokarski@dot.gov with any questions or if you would like to obtain additional details.

Kevin M. Tokarski
Associate Administrator for Strategic Sealift
Our Mission

OIG conducts audits and investigations on behalf of the American public to improve the performance and integrity of DOT’s programs to ensure a safe, efficient, and effective national transportation system.