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Report to the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, House of Representatives

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COAST GUARD

Vessel Identification System Development Needs to Be Reassessed

GAO-02-477

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Highlights

COAST GUARD
Vessel Identification System Development Needs to Be Reassessed

Highlights of GAO-02-477, a report to the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, House of Representatives.

Why GAO Did This Study

In 1988, the Congress passed legislation that required the Coast Guard to develop a vessel identification system to share individual states' vessel information as well as information on federally documented vessels. With such a system, the Coast Guard and state law enforcement officials could more effectively identify information on vessels in our nation's ports and waterways—the need for which has heightened since the September 11 terrorist attacks.

Thus, GAO was asked to determine the Coast Guard's efforts to acquire the system and whether its acquisition plans are adequate.

What GAO Recommends

GAO recommends that the Coast Guard

- reassess VIS risks and options for addressing these risks;
- if it decides to move forward with the project, do so in compliance with a rigorous system acquisition process; and
- evaluate interim solutions that could provide some vessel information until a full system can be implemented.

Coast Guard officials agreed to consider our recommendations, but noted that the rigorous process called for by Coast Guard policy does not apply to VIS because it is not considered a major acquisition.

What GAO Found

The Coast Guard's early efforts to acquire its Vessel Identification System (VIS) were unsuccessful. The Coast Guard accepted a contractor-developed VIS in 1998 despite system performance problems, intending to resolve these problems as the system evolved. However, the Coast Guard found no viable way to correct these and other problems and found that the cost to populate the system would be high. Coast Guard officials noted two factors that complicated the VIS effort: (1) not all vessels had unique identification numbers and (2) the system depended on the voluntary participation of the states, with many states unwilling or unable to commit the funds needed to participate. Although the Coast Guard spent over $9 million, VIS was never implemented. Since then, the Coast Guard initiated a new three-phase effort to develop VIS, but is unable to estimate when it will develop a system that could upload, integrate, and update states' data.

Even as the Coast Guard is initiating efforts to plan for developing the full system, it does not plan to incorporate a rigorous acquisition process, including comprehensive analyses and oversight. Coast Guard officials plan to assess VIS costs, benefits, and risks, but do not plan to undertake all elements of a comprehensive approach, including mission needs assessment and acquisition board oversight. According to Coast Guard officials, these acquisition processes—as called for in the agency's system acquisition policy—do not apply to future VIS efforts because the system will likely fall below the policy's cost threshold. However, we believe that a rigorous acquisition process is especially essential to any new VIS effort because the Coast Guard is still facing some of the risks that undermined the early VIS, criticality and needs may be evolving as a result of the recent terrorist attacks, and new alternatives are now available.

Vessel pulled over for negligent operation. VIS would provide Coast Guard and state officials with information on the vessel and its owner before boarding. Source: U.S. Coast Guard.

This is a test for developing highlights for a GAO report. The full report, including GAO's objectives, scope, methodology, and analysis is available at www.gao.gov/cgi-bin/getrpt?GAO-02-477. For additional information about this report, contact Linda Koontz (202-512-6240). To provide comments on this test highlights, contact Keith Fultz (202-512-3200) or e-mail HighlightsTest@gao.gov.

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United States General Accounting Office
Washington, DC 20548

May 24, 2002

The Honorable Frank LoBiondo
Chairman
The Honorable Corrine Brown
Ranking Democratic Member
Subcommittee on Coast Guard and Maritime Transportation
Committee on Transportation and Infrastructure
House of Representatives

The September 11, 2001, attacks on our nation emphasized the need for sound government information management—especially as it pertains to potential risks to U.S. assets and citizens. One possible source of that risk is through the vessels that navigate our ports and waterways.

Whereas most large commercial vessels and many large recreational vessels obtain federal documentation, most smaller vessels are registered only in the state where they are primarily used. In 1988, the Congress required the secretary of transportation to develop a system to share individual states' vessel information as well as information on federally documented vessels. A vessel identification system would allow the Department of Transportation's Coast Guard and local law enforcement officials to more effectively identify critical information on vessels in our nation's ports and waterways—information including the owner's name, vessel identification, and any prior law enforcement activities associated with the vessel.

Concerned with the Coast Guard's lack of progress in developing its Vessel Identification System (VIS), you asked us to assess efforts to establish this system. Specifically, our objectives were to determine (1) the Coast Guard's early efforts to acquire VIS, (2) the agency's current plans for developing the system, and (3) whether Coast Guard acquisition plans are adequate.

To address these objectives, we reviewed past and current VIS acquisition documents, evaluated Coast Guard plans to acquire VIS by comparing them to sound acquisition principles, and interviewed Coast Guard officials, contractor staff, and state boating representatives. We conducted our review at the U.S. Coast Guard Headquarters in Washington, D.C., the Coast Guard's Operations Systems Center (OSC) in Martinsburg, West Virginia, and the National Association of State Boating Law Administrators annual conference in Anchorage, Alaska, from October 2001 through

March 2002, in accordance with generally accepted government auditing standards. Appendix I contains further details on our scope and methodology.

Results in Brief

Fourteen years after legislation required the Coast Guard to develop a vessel identification system, no such system exists, and future plans for developing the system are uncertain. The Coast Guard's early efforts to acquire VIS were unsuccessful. In the late 1980's and early 1990's, the Coast Guard undertook numerous activities to define requirements for such a system. In 1995, the agency contracted to develop the Marine Information for Safety and Law Enforcement (MISLE) system, of which VIS was a subcomponent. The Coast Guard accepted the contractor-developed VIS in 1998 despite system performance problems, intending to resolve these problems as the system evolved. However, the Coast Guard later found that there was no viable way to correct these and other problems, and that the cost to populate the system with states' data would be high. In retrospect, Coast Guard officials noted two factors that complicated VIS implementation: (1) not all vessels had unique identification numbers and (2) the system depended on the voluntary participation of the states, and many states were unwilling or unable to commit the funds needed to participate. Consequently, even though the Coast Guard spent about $9 million in identified costs to plan and develop VIS, it was never implemented.

Since that time, the Coast Guard has initiated a new three-phase VIS development effort and, in fact, developed a rudimentary system—called VIS 2.0—which is populated with information on documented vessels and one state's data. However, the Coast Guard has not yet developed detailed plans for the full system development and is unable to estimate when a system capable of uploading, integrating, and updating states' data may be developed.

Even as the Coast Guard is initiating efforts to plan for the full system development, it does not intend to incorporate a rigorous acquisition process—including comprehensive analyses and management oversight. Coast Guard officials stated that they intend to analyze VIS costs, benefits, and risks and to evaluate acquisition options, but they do not plan to follow the Coast Guard's acquisition policy—-which requires comprehensive analyses, justification, and oversight. Officials noted that the acquisition policy does not apply to the planned VIS development because it is not a major system acquisition, a designation generally applied to projects over $50 million. However, rigorous processes and

oversight, such as those in the acquisition policy, are especially critical on the future VIS acquisition because the Coast Guard is still facing some of the risks that undermined the early VIS acquisition, the system's criticality and requirements may be evolving as a result of the recent terrorist attacks, and new alternatives are now available.

Therefore, we are recommending that the Coast Guard reassess its approach to developing VIS and that the agency perform mission needs identification, alternatives analyses, and oversight activities. We are also recommending that the Coast Guard evaluate alternative interim solutions that could provide some vessel information until a full system can be implemented. Coast Guard officials agreed to consider our recommendations.

Background

Vessel documentation—a national form of vessel registration—is one of the oldest functions of government, dating back to the 11th Act of the First Congress. Documentation provides evidence of nationality for international travel and trade, allows for commerce between the states, and admits vessels to certain restricted trades, such as coastwise trade and the fisheries.[1] The Coast Guard documents most large commercial vessels and many large recreational vessels.[2] This process involves obtaining key information about the owner and vessel—including the owner's name and address, the manner in which the owner took title to a vessel, and, in most cases, when and where a vessel was built. The Coast Guard assigns an official number to all documented vessels in order to track them, and maintains key information about the vessel, including

[1]"Coastwise trade" involves the transportation of merchandise or passengers between points in the United States or in the exclusive economic zone—an area extending 200 miles out from the U.S. shoreline. "Fisheries" involves the processing, storing, transporting (except in foreign commerce), planting, cultivating, catching, taking, or harvesting of fish, shellfish, marine animals, pearls, shells, or marine vegetation in the navigable waters of the United States or in the exclusive economic zone.

[2]Rules governing the documentation of vessels vary, depending on the vessel's volume and whether it is used for commercial or recreational purposes. The Coast Guard only documents vessels with volumes of 5 net tons or more—generally those measuring over 25 feet. Given vessels of these volumes, federal law requires commercial vessels engaged in coastwise trade and the fisheries to obtain federal documentation. In addition, the owners of commercial vessels engaged in foreign trade often choose to obtain federal documentation in order to obtain the protection of the U.S. government. While not required, the Coast Guard also documents recreational vessels of 5 net tons or more. Because only documented vessels are eligible for preferred loans, most mortgage lenders require federal documentation in order to protect themselves.

mortgages, bills of sale, and other instruments affecting the vessel title. However, the Coast Guard does not maintain such information on smaller commercial and recreational vessels or on large recreational vessels that are undocumented. Instead, individual states register these vessels under a variety of numbering programs.[3]

Public Law 100-710, as amended, commonly called the Ship Mortgage Act of 1988, requires the secretary of transportation to establish a vessel identification system to make information on both federally documented vessels and state numbered and titled[4] vessels available for law enforcement and other purposes. The information was to include—among other items—the owner's name, a vessel identifier, the name of the state in which the vessel is numbered or titled, information on any liens associated with the vessel, and information to assist law enforcement officials, such as the date a vessel was stolen or abandoned. The law permits voluntary state participation in providing this information.

Originally, the vessel identification system was expected to assist state boating officials in identifying vessels within their borders, aid law enforcement officials in identifying stolen vessels, help mortgagers avoid remortgaging stolen vessels, and help insurers avoid reinsuring stolen vessels. More recently, given today's heightened state of homeland security, such a system has even more potential usefulness. Coast Guard officials stated that the system could be used to help ensure port and national security. For example, law enforcement officials could use a vessel identification system to review all vessels that have been lost or stolen and verify ownership and law enforcement history. Currently, Coast Guard and local law enforcement officials would have to access multiple sources to obtain this vessel information—an ineffective and time-consuming process.

Within the Coast Guard, several organizations have had a role in past and current efforts to develop a vessel identification system. Specifically, the information and technology directorate—headed by the chief information officer—is responsible for Coast Guard-wide information technology (IT)

[3]Federal law requires any undocumented vessel equipped with propelling machinery to be numbered in the state in which it is primarily operated. In addition, some states require all undocumented vessels to be numbered, even if they are not propelled by machinery.

[4]In addition to numbering vessels, some states also issue titles, which are records of ownership.

strategy and oversight, including IT investment management. This organization also oversees the Operations Systems Center—a government-owned, contractor-operated facility—which develops, fields, and maintains critical systems and data networks. The acquisition directorate was responsible for the early VIS acquisition, whereas the marine safety and environmental protection directorate is responsible for current system efforts. Another office within the operations directorate, the office of boating safety, represents the boating public and coordinates with states on their needs for VIS.

There are clear guidelines and best practices for managing system development efforts such as the vessel identification system. Federal regulations and requirements, including the Clinger-Cohen Act of 1996 and Office of Management and Budget guidance, establish a comprehensive approach for executive agencies to acquire and manage their information resources.[5] This approach includes (1) focusing information resource planning on supporting strategic missions; (2) economically justifying proposed projects on the basis of reliable analysis of expected life-cycle costs, benefits, and risks; and (3) using these measures throughout the life cycle as the basis for decisions on selecting, controlling, and evaluating projects. Additionally, our IT investment management framework, which is based on industry best practices, establishes a systematic process for investment planning management—including selection, control, and evaluation of investment options to maximize the value of the investments and to minimize their risks.[6]

To implement federal requirements and guidance, the Coast Guard has established an overarching investment management framework for selecting, controlling, and evaluating its portfolio of IT investments. Within this framework the Coast Guard established investment and acquisition review boards to oversee investment management processes. Also, underlying agency policies, including the Coast Guard systems acquisition policy, are intended to support this investment framework.

[5]Clinger-Cohen Act of 1996, Public Law 104-106, and Office of Management and Budget Circular A-130 (November 30, 2000).

[6]U.S. General Accounting Office, *Information Technology Investment Management: A Framework for Assessing and Improving Process Maturity*, Exposure Draft, GAO/AIMD-10.1.23, version 1 (Washington, D.C.: May 2000).

We recently evaluated Coast Guard information technology management, and reported that while the agency had many important IT management policies in place, it did not consistently implement these policies.[7] That is, Coast Guard practices are not always in compliance with its policies. For example, in the area of software acquisition, we found that the agency had policies in place for planning and managing software acquisitions and that the agency generally followed these policies on the projects we reviewed. However, in the area of investment management, we found that although the Coast Guard had an investment management framework and policies in place, and implemented these policies for major acquisitions exceeding $50 million, it did not adequately oversee the costs, schedules, and risks of nonmajor acquisitions or operational system projects. We made 17 recommendations to improve the Coast Guard's IT management practices and the agency is working to address these recommendations.

Coast Guard's Early Efforts to Acquire VIS Were Unsuccessful

Soon after the Ship Mortgage Act was enacted, the Coast Guard initiated a series of planning activities to prepare to fulfill the law. Early in 1989, it established a task force to examine options for satisfying the law, and subsequently decided to acquire VIS. The Coast Guard also contracted with the General Services Administration's Federal Systems Integration and Management Center (FEDSIM) to assist in defining the functionality of the system, developing requirements, analyzing alternatives, and acquiring the system. As part of their work to define requirements, the Coast Guard and FEDSIM visited 25 states and the District of Columbia and met with developers and operators of nationwide networks, including the motor vehicle administrator's network. Later, in 1992, the Coast Guard and another contractor surveyed states and developed marketing strategies to demonstrate the benefits of VIS to states in order to attract their participation.

As the plans for a VIS acquisition evolved, the Coast Guard became concerned that it had planned too many separate systems and that it needed to undertake a more integrated approach to developing these systems. Thus, in the early 1990s, the Coast Guard delayed plans to acquire VIS in order to integrate the requirements for multiple systems into a single systems development effort.

[7]U.S. General Accounting Office, *Information Technology Management: Coast Guard Practices Can Be Improved*, GAO-01-190 (Washington, D.C.: Dec. 12, 2000).

In 1995, the Coast Guard awarded a contract to Computer Sciences Corporation (CSC) to develop systems software, which evolved into the MISLE system. Under the original MISLE program baseline, VIS was expected to be the first contract deliverable in December 1997. VIS was to be a centralized information system capable of uploading state registered and federally documented vessel information and any changes to this information. It was to respond to queries for information on vessels and owners by the Coast Guard and federal and state boating and law enforcement officials, and—with some limitations—marine bankers and insurers. The Coast Guard was unable to provide a cost estimate solely for the VIS development, but the cost of VIS combined with another component that was to automate the Coast Guard's vessel documentation process, was estimated to be between $12 million and $15 million.

CSC developed and tested VIS and then delivered it to the Coast Guard in early 1998. The Coast Guard conducted two rounds of operational testing with state and system users. At the conclusion of the second round of testing, the Coast Guard reported that users highly rated both system functionality and their overall satisfaction. In December 1998, the Coast Guard determined that VIS was operationally effective and suitable and formally approved the system for full production and deployment. However, there were still several unresolved problems that had been encountered during operational testing. Specifically, a high-priority problem involved the processing of duplicate vessel entries, while other lower priority problems involved system performance. Coast Guard officials determined that these items were either the responsibility of the states or would be resolved through enhancements to the system as it evolved. Over the next year, the agency and CSC worked to address the unresolved testing problems and to input one state's vessel data into VIS.

As these VIS activities were proceeding, the MISLE contract was experiencing escalating costs and schedule delays. Therefore, the Coast Guard decided to partially terminate its contract with CSC in October 1999.[8] Shortly thereafter, the Coast Guard had OSC[9] evaluate VIS.

[8]We discuss the Coast Guard's MISLE program in our report, U.S. General Accounting Office, *Coast Guard: Update on Marine Information for Safety and Law Enforcement*, GAO-02-11 (Washington, D.C.: Oct. 17, 2001).

In January 2000, OSC recommended that VIS be shut down because of performance problems and the high cost to populate and maintain the system. Specifically, the evaluation cited the following issues:

- **System performance problems**: VIS was unable to effectively upload states' data, deal with data reliability issues, and handle complicated requests for information from states and other users. Specifically, OSC noted that it took over 14 hours to load one state's data into VIS and that this was unacceptably slow. OSC also reported on VIS problems in handling different vessels with duplicate identification numbers and single vessels that had multiple identification numbers—a situation that could occur when a vessel was relocated from one state to another. In addition, OSC noted that complicated queries either took too long to process or were not processed at all. The center reported that solving these issues would involve significant changes to VIS software and hardware.

- **Cost to populate VIS**: The only method available to pull state data into VIS was through customized load routines-—that is, through computer programs for uploading data that were tailored to each state's vessel registration system. OSC noted that the cost of developing a custom routine to load one state's data into VIS was approximately $50,000, and estimated that it would cost the Coast Guard an additional $2.45 million to develop interfaces for all states to be able to use VIS as it was intended. In addition, OSC reported that all the interfaces would have to be maintained and updated when each state updated its system.

- **Cost to maintain VIS**: Although VIS application tools were state of the art in 1995, they were outdated in 2000. OSC noted that finding staff experienced with these tools would be difficult. Therefore, OSC reported that operations and maintenance costs for VIS would be significant and suggested replacing these tools with updated ones.

In addition, Coast Guard officials cited two key factors that hindered the implementation of VIS:

- **Lack of unique hull identification numbers**: Coast Guard officials told us that in developing VIS, the contractor had assumed that vessels would have unique hull identification numbers (HINs), but in fact, many do not.

[9]OSC's primary contractor has changed over the years. From 1996 until August 2001, OSC's primary contractor was Fuentez Systems Concepts, Incorporated. On July 6, 2001, OSC awarded its primary operations contract to QSS Group, Inc.; major subcontractors include Fuentez Systems Concepts, Incorporated and Litton TRC.

Because manufacturers were not required to provide unique HINs before 1972, many vessels do not have these numbers, while others do not have unique HINs—that is, multiple vessels share an identical HIN. Thus, the Coast Guard encountered major data integrity problems when entering vessels into VIS.

- **Voluntary nature of state participation**: The MISLE project manager stated that the Coast Guard could not force the states to contribute their vessel data, and that a lack of participation by states would undermine the usefulness of the system. Other Coast Guard officials stated that many states were unwilling or unable to commit the funds necessary to participate in VIS.

Given these problems, key stakeholders agreed that there was no viable way to correct VIS's deficiencies, and the MISLE project manager decided not to provide any additional MISLE project funds to the project. As a result, the original VIS development effort was never implemented, even though the Coast Guard reportedly spent about $9 million[10] to plan, acquire, and attempt to implement the system.

Coast Guard Initiated a New VIS Development Effort, but Future Plans Are Uncertain

After its initial unsuccessful effort, the Coast Guard initiated a new attempt to develop a vessel identification system. In its January 2000 evaluation report, OSC recommended a three-phased approach to developing a new vessel identification system. The three phases were having OSC (1) add to the limited amount of information on federally documented vessels that was available on-line and provide a password security feature, (2) develop a generic state vessel registration system that could be integrated into a proposed new VIS system and distribute it to states and territories, and (3) develop the new VIS system that would integrate information from the states and federally documented vessels. The Coast Guard agreed to these recommendations and implemented phases 1 and 2 at a reported cost of about $220,000. However, it has not yet committed to the full development effort proposed in phase 3 because

[10]This figure includes costs associated with early planning efforts from 1987 to 1990 and CSC contract costs attributed to VIS. It does not include costs of planning efforts between 1991 and 1994 because the Coast Guard was not able to identify these. Also, the costs for the years from 1995 to 1999 do not include any funds associated with Coast Guard personnel or management because the agency was not required to track government costs associated with a particular subcomponent.

the agency is working to validate states' requirements for the system. The Coast Guard's plans for this development are uncertain.

Phase 1 Has Been Completed and Enhanced

In October 2000, OSC implemented phase 1 of a new VIS development effort in a system called VIS 1.0, at a cost of $135,700. To develop VIS 1.0, OSC modified a copy of the Coast Guard's Port State Information Exchange—an existing Web-based database that contains some on-line information on federally documented vessels—to include seven additional data fields that the states had requested, including information such as the vessel owner's name and address. It also added a password security feature to protect privacy information.

In October 2001, to enhance the system, OSC issued a subsequent release, VIS 2.0, at a cost of $58,100. In VIS 2.0, OSC added a one-time load of boating registration data from one state (Georgia), expanded the database to include an additional 67 data fields, and enhanced the system's reporting capabilities. Officials noted that the primary reason for these additions was to demonstrate to the states what VIS could do before building the entire system in phase 3.

Phase 2 Was Developed and Distributed Without a Key Envisioned Capability

To address past problems in uploading and integrating states data, OSC proposed developing phase 2, a generic boating-registration data-entry system for states to use. The Coast Guard planned to distribute this system to states and encourage them to use it. In developing a cost estimate for this effort, OSC included an estimate for an export routine that would enable states to export their data so that it could be loaded into a future VIS system. However, the Coast Guard removed the envisioned export routine from this development effort because it had not yet defined a format for the future VIS system.

A contractor[11] developed a generic boating registration system, called the National Boating Registration (NABR), at a cost of $25,000. Although the Coast Guard distributed NABR to the states in July 2001, in the months since its distribution, NABR has not been heavily used. In fact, the Coast Guard is aware of only one state that is planning to use a modified version of NABR. Instead, Coast Guard officials indicated that most states are

[11]Coast Guard officials reported that Fuentez Systems Concepts, Incorporated developed the NABR system independent of its OSC support contract.

using their own registration systems. Coast Guard officials are hopeful that territories that do not currently have a registration system will be able to use NABR.

Coast Guard's Plans for Full VIS Development Are Not Yet Defined

The Coast Guard's current plans for the future of VIS are uncertain. The Coast Guard halted further work on VIS after phase 2 was completed, stating that it needed to review and update VIS requirements before deciding to fund phase 3. Coast Guard officials told us that they recently met with states to validate VIS requirements and plan to send these requirements to OSC by the end of May 2002. OSC will then develop a cost estimate for the system development effort. Coast Guard officials were unable to provide schedule estimates for when they would make decisions regarding any future VIS development.

Coast Guard Does Not Plan to Follow a Rigorous Acquisition Process on Future VIS Effort

To effectively develop systems, federal requirements, Coast Guard policies, and sound system acquisition principles call for key assessments and oversight at the inception of a system acquisition effort. Specifically, our investment management framework calls for evaluating completed projects and identifying lessons learned to incorporate in future development efforts. Additionally, Coast Guard system acquisition policy—as well as sound system life-cycle management principles—calls for identifying mission needs and operational requirements; exploring suitable, feasible, and affordable alternatives for meeting those needs through trade-off analyses and feasibility studies; assessing the costs, benefits, and risks of the proposed alternatives; and developing an acquisition plan. Coast Guard policies also call for oversight and approval of these key assessments by an acquisition board throughout this early planning process. After an acquisition proposal has been justified and approved, program management focuses on developing a detailed system design and project plans, including cost estimates and schedule milestones.

In commenting on a draft of this report, Coast Guard officials noted that the agency recently revised its systems acquisition policy so that it now targets only major acquisitions—generally, those expected to cost over $50 million. An acquisition official stated that the agency is working to develop policies to guide smaller acquisitions, including VIS, but does not yet have these policies in place. Further, the Coast Guard could not estimate a time frame for doing so.

Although Coast Guard officials plan to perform important analyses to support future VIS efforts, they do not plan to follow all elements of a rigorous process—including comprehensive assessments, justification, and senior management oversight. Coast Guard officials recently met with states' representatives to validate VIS requirements and reported that they plan to have OSC assess these requirements to identify cost, schedule, and technical issues and risks. Further, Coast Guard officials stated that they plan to review this analysis, along with lessons learned from prior VIS efforts, to evaluate alternative strategies for developing VIS. However, the Coast Guard has not formally assessed and developed plans to address lessons learned from its prior VIS efforts or reassessed its mission needs. Also, without a structured policy and oversight, it is not clear that the Coast Guard will fully explore alternative concepts for satisfying system needs through trade-off analyses and feasibility studies. Further, Coast Guard officials stated that the acquisition board will not oversee planned VIS activities.

The reason that the Coast Guard does not plan to perform these system acquisition activities or obtain acquisition oversight on its new VIS effort is that it does not believe that these activities are required. Coast Guard marine safety officials stated that because VIS will not meet the dollar threshold for a major system acquisition, Coast Guard policies requiring these analyses, justification, and oversight do not apply to planned VIS efforts.

However, comprehensive analyses and oversight are especially critical for a new VIS effort because of the difficulty the agency has had to date in developing the system, and since so much has changed since the system was first justified and approved in the mid-1990s. The Coast Guard is still facing some of the risks that undermined past efforts to acquire VIS, and there is no evidence that these risks have been addressed. In addition, the system's criticality and mission needs may have evolved, and new alternatives are now available.

Key risks that undermined past efforts to acquire the system are likely to hinder any new efforts. Specifically, Coast Guard officials stated that problems with duplicative or nonexistent HINs are still a concern and that any new system development effort will need to be able to handle a variety of situations involving vessel identifiers, including vessels (1) without HINs, (2) with duplicative HINs, and (3) with invalid HINs.

Further, Coast Guard officials noted that a lack of state participation would undermine any new effort. Because state participation is voluntary,

there is no guarantee that states will choose to provide their vessel data and any updates to that data to a new VIS system. In fact, several states' representatives have reported that they are unable to commit to future VIS efforts because of the cost of converting their data to the Coast Guard's format and updating the data as they change. State boating representatives we contacted acknowledged VIS benefits—including assisting in recovering stolen vessels, decreasing fraud associated with stolen vessels, and deterring vessel theft—but just as many expressed concerns with the technical complexity and/or the cost of converting their data to the Coast Guard's format. Unless these risks are assessed and managed, they may undermine any future system development efforts.

While the Coast Guard is still facing these former risks, it is also encountering evolving needs and new alternatives for VIS. Regarding mission needs, recent national security issues and consumer safety hazards[12] have reemphasized the need for states' vessel data within the Coast Guard. According to a Coast Guard official, although the Coast Guard has not viewed recreational vessels as a national security risk in the past, it is now doing so in light of the recent terrorist attacks. Unless these potential mission needs are identified and their requirements factored into VIS's design and development, the Coast Guard risks developing a system that does not capture all the critical information or functions needed to support its evolving missions.

In addition to evolving needs for information on state-registered vessels, there are new and promising alternatives for meeting these needs. Specifically, several private companies obtain and integrate information on state-registered vessels for marketing purposes. Although it is not clear whether these companies can meet all user needs for up-to-date vessel data, their information is more integrated and up to date than the Coast Guard's. For example, one company maintains a database containing limited vessel data from 46 states and updates some states' data every 6 weeks, while another maintains limited vessel information from 44 states and has suggested that it would update the data quarterly. Coast Guard officials are aware of these options and have stated that they are too expensive and not timely enough to meet law enforcement needs.

[12]Recent carbon monoxide deaths associated with certain houseboats highlighted the need for more effectively identifying vessel owners to alert them to hazards and to issue recall notices.

However, the agency has not performed any analysis of the costs, benefits, and risks of these alternatives.

Also, new technologies, such as the extensible markup language (XML), have the potential to resolve some of the past problems the Coast Guard has had in integrating state data. XML is a flexible, nonproprietary set of standards designed to facilitate the exchange of information among disparate computer systems using the Internet's protocols. Although implementation challenges still exist, this technology holds promise as a way to effectively integrate data from diverse systems.[13] Unless these and other potential alternatives are evaluated, the Coast Guard may miss key opportunities to develop VIS more effectively.

By not incorporating a rigorous system acquisition process, the Coast Guard risks developing a system that does not address past problems, fulfill its mission needs, or effectively use new technologies and commercial products. Without such processes and a commensurate level of management oversight, the Coast Guard is unlikely to successfully develop and effectively implement a vessel identification system.

Conclusions

The Coast Guard has little to show for the 14 years it has spent trying to develop a vessel identification system to aid state and federal law enforcement activities. Past efforts to develop the system were unsuccessful. The agency is now considering another attempt at developing VIS, but is not straying far from its past, unsuccessful efforts.

By planning to develop VIS as if it were a low-risk project, instead of a system acquisition effort that warrants a thorough system acquisition approach to analyses, justification, and oversight, the Coast Guard runs the risk that VIS will continue as it has for the past 14 years. That is, funds will be spent and products will be developed and delivered, yet users' needs for this system will continue to be unfulfilled.

Given the continuing risks, changing needs, and new alternatives, it is imperative that this system be approached anew with an understanding of

[13]U.S. General Accounting Office, *Electronic Government: Challenges to Effective Adoption of the Extensible Markup Language*, GAO-02-327 (Washington, D.C.: Apr. 5, 2002).

what went wrong in prior efforts, with sound system acquisition processes in place, and with adequate program management and oversight.

Recommendations

In order to mitigate the risk that the Coast Guard will continue to spend funds on VIS but not fulfill the requirements of the 1988 law, we recommend that the secretary of transportation direct the Coast Guard commandant to ensure that the following actions occur to reassess VIS:

- determine if the problems with nonunique HINs and a lack of state participation are still pertinent;
- if so, identify what can be done to mitigate these risks; and
- brief relevant congressional committees and subcommittees on critical VIS risks and options for addressing these risks within 3 months of the date of this report.

If the Coast Guard decides to move forward in developing a VIS, we recommend that it do so in compliance with a rigorous system acquisition approach. Specifically,

- reassess mission needs in light of evolving homeland security initiatives and define and validate user requirements to support these mission needs;
- identify alternatives for fulfilling these needs, including the use of commercial vendors and new technologies;
- perform feasibility studies as well as cost, benefit, and risk analyses of these alternatives;
- select a system design;
- develop an acquisition plan that incorporates cost and schedule milestones; and
- obtain oversight from the Coast Guard acquisition board throughout the VIS acquisition process to help ensure that it is effectively managed.

Additionally, we recommend that the Coast Guard evaluate the use of commercial products that could provide vessel information as an immediate, interim solution until a system that fully meets the requirements of the Ship Mortgage Act can be developed.

Agency Comments and Our Evaluation

In providing oral comments on a draft of this report, representatives of the Department of Transportation and the Coast Guard, including a representative of the Office of the Secretary of Transportation and the chief of the Office of Information Resources, agreed to consider our recommendations. Coast Guard officials reported that the agency would

not expend any further funds on developing VIS until it develops a viable plan to address the technical and financial barriers to a successful VIS implementation. Further, officials stated that they intend to apply sound acquisition principles in developing VIS, but do not need to follow all the requirements for major acquisitions. Coast Guard officials also offered specific technical corrections, which we have incorporated as appropriate.

We believe that rigorous processes and oversight, such as those in the Coast Guard's systems acquisition policy, are especially critical on the future VIS acquisition because the Coast Guard is still facing some of the risks that undermined the early VIS acquisition, the system's criticality and requirements may be evolving as a result of the recent terrorist attacks, and new alternatives are now available.

We are sending copies of this report to the secretary of transportation, the Coast Guard commandant, the director of the Office of Management and Budget, and other interested parties. Copies will also be made available to others upon request.

Should you or your staff have any questions concerning this report, please contact me at (202) 512-6240 or by e-mail at koontzl@gao.gov. Sophia Harrison, Franklin Jackson, Colleen Phillips, Cynthia Scott, and Glenda Wright were major contributors to this report.

Linda D. Koontz

Director, Information Management Issues

Appendix I: Scope and Methodology

To determine the Coast Guard's early efforts to acquire VIS, we reviewed Public Law 100-710, which required the establishment of a vessel identification system and identified the specific information that the system was to include. We reviewed documents that outlined the Coast Guard's early efforts to define and develop functional requirements. We also evaluated the Coast Guard's Marine Information for Safety and Law Enforcement (MISLE) system project plans, operational requirements document, and acquisition project baselines to determine the Coast Guard's plans for developing a system that would meet the requirements of Public Law 100-710.

In addition, we reviewed the specific contract task orders for VIS development, data conversion, and operation and maintenance efforts. Further, we reviewed and evaluated VIS formal qualification testing and operational test and evaluation reports, including system problem reports outstanding at the end of each of these phases of testing. Although we reviewed the Operations Systems Center's (OSC) assessment of the Coast Guard's first VIS effort, we were not able to validate this assessment because OSC did not provide supporting documentation to the Coast Guard at the time it completed its evaluation and did not maintain such documentation after that time.

We also interviewed the MISLE project manager and representatives from the offices of information resources and boating safety to determine their assessment of VIS and to provide details on its acceptance.

To determine the Coast Guard's current plans for developing VIS, we reviewed the current VIS statements of work, project plans, testing efforts and results, and implementation and usage statistics by state representatives. We interviewed project sponsor representatives and contractor staff to determine how these efforts had been planned, developed, and tested. Regarding the Coast Guard's future VIS plans, we interviewed the MISLE project sponsor representatives as well as representatives from the office of boating safety. In addition, we interviewed the MISLE project manager and reviewed and evaluated future VIS planning documents. We also contacted state boating law officials representing 20 states and territories to identify their efforts to participate in prior VIS efforts and to determine their perceptions of VIS's benefits and challenges.

To assess whether the Coast Guard's VIS acquisition practices are adequate, we compared documentation supporting the current VIS development effort to the analyses and justification required under sound

system acquisition processes, including federal regulations and the Coast Guard's own system acquisition policies. We also interviewed Coast Guard officials to discuss their plans for analyzing and justifying new VIS efforts.

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