OFFICE OF INSPECTOR GENERAL

Coast Guard Should Prioritize Upgrades to Rescue 21 Alaska and Expand Its Public Notifications during Outages

Homeland Security

September 21, 2021

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OFFICE OF INSPECTOR GENERAL
Department of Homeland Security

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September 21, 2021

MEMORANDUM FOR: Admiral Karl L. Schultz
Commandant
United States Coast Guard

FROM: Joseph V. Cuffari, Ph.D.
Inspector General

JOSEPH V CUFFARI
Digitally signed by JOSEPH V CUFFARI
Date: 2021.09.21 10:52:05 -04'00'

SUBJECT: *Coast Guard Should Prioritize Upgrades to Rescue 21 Alaska and Expand Its Public Notifications during Outages*

Attached for your information is our final report, *Coast Guard Should Prioritize Upgrades to Rescue 21 Alaska and Expand Its Public Notifications during Outages*. We incorporated the formal comments from the Coast Guard in the final report.

The report contains two recommendations to ensure the Coast Guard prioritizes Rescue 21 Alaska upgrades and appropriately notifies the public of outages. Your office concurred with both recommendations. Based on information provided in your response to the draft report, we consider both recommendations resolved and open. Once your office has fully implemented the recommendations, please submit a formal close out letter to us within 30 days so we may close the recommendations. The letter should be accompanied by evidence of completion of agreed upon corrective actions. Please send your response or closure requests to OIGISPFollowup@oig.dhs.gov.

Consistent with our responsibility under the *Inspector General Act*, we will provide copies of our report to congressional committees with oversight and appropriation responsibility over the Department of Homeland Security. We will post the report on our website for public dissemination.

Please call me with any questions, or your staff may contact Thomas Kait, Deputy Inspector General for the Office of Inspections and Evaluations, at (202) 981-6000.

Attachment

DHS OIG HIGHLIGHTS

Coast Guard Should Prioritize Upgrades to Rescue 21 Alaska and Expand Its Public Notifications during Outages

September 21, 2021

Why We Did This Inspection

Following reports of persistent distress signal communication outages in Alaska, we evaluated whether the Coast Guard is adequately addressing the outages and conducting appropriate notifications to the public when outages occur.

What We Recommend

We made two recommendations to ensure the Coast Guard prioritizes Rescue 21 Alaska upgrades and appropriately notifies the public of outages.

For Further Information:
Contact our Office of Public Affairs at (202) 981-6000, or email us at DHS-OIG.OfficePublicAffairs@oig.dhs.gov

What We Found

Rescue 21 Alaska, Coast Guard's maritime search and rescue communication system, has experienced outages resulting from antiquated equipment in Coast Guard's District 17. Challenges and funding shortages during system acquisition caused Coast Guard to limit the purchase of new equipment for Rescue 21 Alaska, requiring District 17 to maintain existing equipment for longer than initially planned. Alaska's winter weather conditions and remote access to communication site locations cause lengthy repair times, further exacerbating outage impacts. The outages have prevented Coast Guard, at times, from effectively receiving and responding to distress calls from mariners. Coast Guard has made some upgrades to the Rescue 21 Alaska system to enhance distress communication availability and reliability. Although Coast Guard plans for further upgrades, outages persist.

When notifying the public about outages, Coast Guard primarily relied on a "Local Notice to Mariners" posted on its public website. However, this limits who can receive the notices, as not all mariners go to the internet to determine outage locations. Alaska mariners shared other effective methods Coast Guard could use to improve its notifications to the public when there are known VHF distress communication outages.

Adequately upgrading the communication equipment and ensuring robust attempts are made to notify the public when outages occur is essential for Coast Guard to achieve its search and rescue mission in Alaska.

Coast Guard Response

Coast Guard concurred with both recommendations. We included a copy of Coast Guard's response in Appendix B.

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Abbreviations

AIS	Automatic Identification System
AOR	area of responsibility
BNM	Broadcast Notice to Mariners
C.F.R.	Code of Federal Regulations
CONUS	contiguous United States
DSC	Digital Selective Calling
FM	Frequency Modulated
LNM	Local Notice to Mariners
MXAK	Alaska Marine Exchange
NDRS	National Distress and Response System
OCONUS	outside the contiguous United States
RFF	Remote Fixed Facility
SAR	search and rescue
U.S.C.	United States Code
VHF	Very High Frequency

Background

The United States Coast Guard (Coast Guard) is the lead agency for maritime search and rescue (SAR) in U.S. waters and consists of nine operational Districts. Coast Guard's District 17, comprised of Sectors Juneau and Anchorage, encompasses nearly 4 million square miles and more than 47,300 miles of coastal shoreline throughout Alaska and the Arctic. District 17's mission is to serve and safeguard the public, protect the environment and its resources, and defend the Nation's interests in the Alaskan maritime region.

The Coast Guard develops, operates, and maintains safety of U.S. waters,[1] including providing distress and safety communications for commercial and recreational boaters. Since the early 1970s, the Coast Guard has relied on the National Distress and Response System (NDRS) as its communication infrastructure for SAR activities. The NDRS' primary purposes included monitoring the international distress frequency, Very High Frequency (VHF) Frequency Modulated (FM) Channel 16 (156.8 MHz) and providing primary command and control for Coast Guard's SAR activities. Known as the maritime version of 911, Channel 16 facilitates SAR communications and allows the Coast Guard to locate mariners in distress and save lives and property at sea.

In 2002, the Coast Guard contracted for a new communication system to replace the antiquated NDRS and improve its nationwide SAR capabilities. The new communication system, dubbed Rescue 21, is a shortrange communication system, covering approximately 20 nautical miles offshore. Rescue 21 includes VHF-FM radios, communications towers that receive and relay VHF transmissions over microwave frequencies, and hardware and software at Coast Guard sites and on Coast Guard assets.

Initially, Coast Guard planned the acquisition of Rescue 21, including in Alaska, as part of a large-scale nationwide modernization effort. However, in 2007, the Coast Guard, citing the unique geographic, operational, and environmental challenges in the Alaska region, diverged new system plans for Alaska and created a modified system design, dubbed "Rescue 21 Alaska," to replace NDRS in District 17's area of responsibility (AOR).[2] According to the

[1] The Coast Guard shall "develop, establish, maintain, and operate, with due regard to the requirements of national defense, aids to maritime navigation, icebreaking facilities, and rescue facilities for the promotion of safety on, under, and over the high seas and waters subject to the jurisdiction of the United States." 14 United States Code (U.S.C.) § 102(4).

[2] At this time, Coast Guard also separated the "Western Rivers" portion of the United States area from the larger Rescue 21 acquisition. This separation created three Rescue 21 systems: Rescue 21 (also referred to as Rescue 21 Coastal, including coastal CONUS, OCONUS islands, and Great Lakes), Rescue 21 Western Rivers (Mississippi River and Ohio River Valley), and Rescue 21 Alaska.

Coast Guard, upon completion in 2017, Rescue 21 replaced the NDRS legacy communications system in the coastal zones of the contiguous United States.

Rescue 21 Alaska consists of 33 VHF tower sites commonly referred to as Remote Fixed Facilities (RFF), 18 in Sector Anchorage and 15 in Sector Juneau, to communicate with mariners. Coast Guard encourages the use of VHF-FM radio[3] as the primary method of distress notification and identifies it as the most effective way for Coast Guard to communicate with mariners.[4] Moreover, Coast Guard teaches that the following elements, which are typically shared by voice communication over VHF-FM Channel 16, are needed to develop a successful search plan:

- vessel position;
- number of people on board;
- nature of the distress;
- call back number; and
- vessel description.

Many of the RFF sites in Alaska are located on islands or remote mountain tops only accessible by helicopter. Figure 1 shows one such RFF, the Althorp Peak site in Sector Juneau, in both summer and winter weather conditions.

[3] VHF-FM radio allows Coast Guard and mariners to communicate via voice communication, among other ways, over Channel 16.
[4] *United States Coast Guard Telecommunication Manual, COMDTINST M2000.3F,* p. 12-4, Apr. 2013.

Figure 1. Althorp Peak RFF Site in Summer and Winter Weather Conditions as Shown Overlaid on a Map of RFF Sites in District 17's Juneau Sector.
Source: Map and photos provided by Coast Guard

In early November 2019, members of Congress wrote to the Coast Guard Commandant expressing concerns about reports of VHF-FM radio outages in District 17's AOR and called for Coast Guard to promptly find a way to repair the Rescue 21 VHF distress communication system in Alaska.[5] According to media reports, the outages could contribute to dangerous incidents in Alaska, leaving Coast Guard unable to hear mariners in distress.[6] Because of these

[5] Senator Murkowski, Representative Young, and Senator Sullivan Letter to Coast Guard Admiral Shultz, Nov. 6, 2019.

[6] Margaret Bauman, *Coast Guard confirms serious problems with channel 16*, The Cordova Times (Nov. 2, 2019), https://www.thecordovatimes.com/2019/11/02/coast-guard-confirms-serious-problems-with-channel-16/; *Coast Guard's VHF signal down for much of coastal Alaska,* Raven Radio (Nov. 8, 2019), https://www.kcaw.org/2019/11/08/coast-guards-vhf-signal-down-for-much-of-coastal-alaska-2/; and *Fishermen want Coast Guard communications channel fixed,* Alaska Native News (Nov. 2, 2019), https://alaska-native-news.com/fishermen-want-coast-guard-communications-channel-fixed/45498/are among the news media reports about the outages.

reports of widespread outages and the potential impact to mariner safety, we examined whether Coast Guard adequately addressed distress signal outages and issued appropriate notifications about outages to reduce the risk of loss of life or property. This report focuses on Coast Guard's actions since 2019 to communicate about and mitigate outages. We also reviewed previous actions taken by Coast Guard that likely contributed to the pervasive outages that began receiving media attention in late 2019.

Results of Inspection

Rescue 21 Alaska has experienced outages resulting from antiquated equipment in Coast Guard's District 17. Challenges and funding shortages during system acquisition caused Coast Guard to limit its purchase of new equipment for Rescue 21 Alaska. As a result, District 17 had to maintain existing equipment for longer than intended. Alaska's winter weather conditions and remote communication site locations cause lengthy repair times, further exacerbating outage impacts. At times, the outages have prevented Coast Guard from effectively receiving and responding to distress calls from mariners. Coast Guard has made some upgrades, with plans for more, to the Rescue 21 Alaska system to enhance distress communication availability and reliability, but outages have persisted.

Overall, Coast Guard could improve notifications to the public of VHF distress communication outages. When notifying the public of outages, Coast Guard primarily relied on a "Local Notice to Mariners"[7] posted on its public website. However, not all mariners go online to determine outage locations, thus limiting who receives the notices. In March 2021, we sent a questionnaire to Coast Guard stakeholders in Alaska to understand how outages have affected them.[8] In response, Alaska mariners shared other effective methods Coast Guard could use, such as local radio broadcasts.

Degraded Operational Capabilities Persist for Rescue 21 Alaska

Since at least early 2019,[9] Rescue 21 Alaska has experienced degraded operational capabilities. Multiple RFF sites in District 17 have been inoperable for extended periods, resulting in sustained, widespread communication outages in Southeast and Southcentral Alaska.

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[7] Local Notices to Mariners are publicly available on the Coast Guard website. Also see https://www.navcen.uscg.gov/pdf/lnms/lnm17272021.pdf for an example of a Local Notice to Mariners.
[8] Appendix C contains full text of the questionnaire, *USCG VHF Distress Outages Questionnaire.*
[9] For this report, we examined Coast Guard District 17 RFF site outages from January 2019 to February 2021.

Factors contributing to the outages included delays during the Rescue 21 Alaska acquisition when funding shortages and operational challenges led Coast Guard to reduce the type and number of capabilities intended to be included with the system when deployed. Prior to its completion in 2017, Coast Guard tested the Rescue 21 Alaska system and identified unresolved system deficiencies related to operational suitability, reliability, and availability. These issues have contributed to Coast Guard's stakeholders in Alaska noticing an increase in outages, with mariners reporting they did not recall experiencing extensive outages prior to 2019 but noted increased outages since.

In a July 2020 briefing to Congress, Coast Guard District 17 officials noted they had dedicated $14 million for Rescue 21 Alaska infrastructure equipment modernization. Nonetheless, communication outages persist, and Rescue 21 Alaska continues to experience degraded operational capabilities.

Rescue 21 Alaska VHF Communications Towers Routinely Experience Outages

Since January 2019, multiple RFF sites in District 17 have been inoperable for extended periods, resulting in sustained, widespread communications outages in Southeast and Southcentral Alaska and degraded operational capabilities for Rescue 21 Alaska. In October 2019, the Coast Guard issued a press release[10] regarding the outages instructing mariners to maintain "other means of emergency communication." The most pervasive outages occurred in February 2020, when 11 of 33 towers were less than 5 percent functional for the month.

According to Coast Guard standard operating procedures, District 17 Sector Commanders must maintain "a continuous and effective distress guard on the VHF-FM Rescue 21 System, and any remaining legacy National Distress System."[11] The procedures also specify that Rescue 21 is the primary means by which the Coast Guard listens to VHF-FM distress Channel 16.[12] Further, the procedures require that distress communications take precedence over all other types of communication.[13] However, when RFF sites experience outages, Coast Guard is unable to perform these duties.

Coast Guard's Functional Requirements Document for Rescue 21 Alaska specifies requirements such as reliability, recoverability, and availability.[14] The

[10] *Coast Guard experiencing VHF-FM radio outages throughout Southeast Alaska, reminds public of secondary means of emergency communication,* Oct. 14, 2019. https://content.govdelivery.com/accounts/USDHSCG/bulletins/26615de.
[11] *Coast Guard Seventeenth District Instruction 2000.1C*, Apr. 9, 2018.
[12] *Id.*
[13] *Id.*
[14] *Rescue 21 - Alaska, Functional Requirements Document,* Version 1.0, Apr. 5, 2012.

reliability requirements include objectives and thresholds[15] for the system when the RFF sites encounter wind gusts, freezing temperatures and rain, and ice and snow build up, and the recoverability requirements to restore function and data are distributed across multiple system components. One key threshold for system capability is to have full capabilities restored within 21 days after experiencing degraded site communications. The guidance also specifies, unless performing system maintenance or upon a casualty condition, the system is expected to be operational at all times throughout the year.

In a February 2020 briefing to members of the Alaska maritime community, Coast Guard officials described a noticeable increase of degraded VHF coverage at some RFF sites and noted the average availability across all 33 sites was 85 percent, although the availability per site ranged between 26 and 100 percent. The Rescue 21 Alaska Functional Requirements Document establishes 98 percent operational availability as a threshold requirement, including the ability to receive distress calls, emergency alerts, and voice calls.[16]

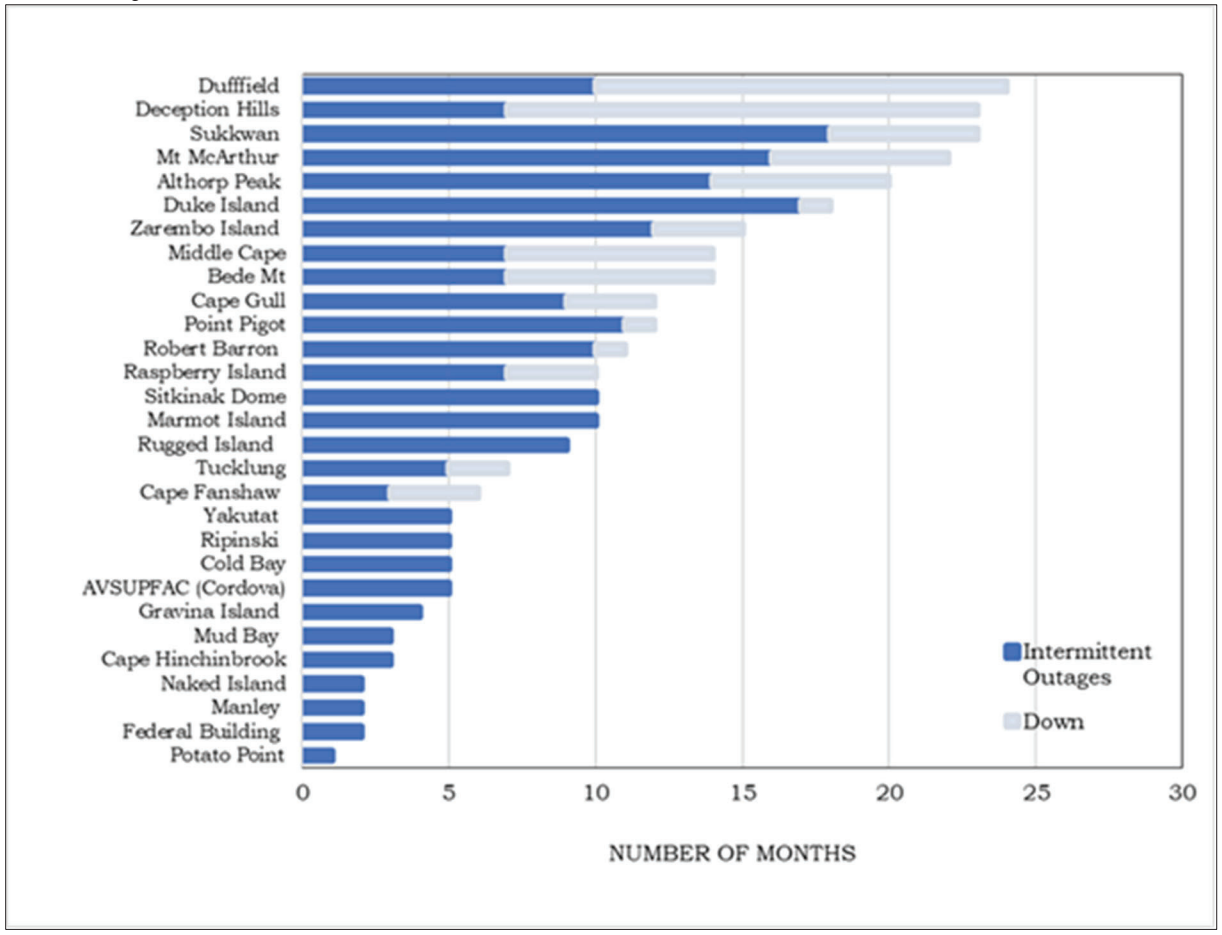
We evaluated the operational availability at the 33 RFF sites in the Rescue 21 Alaska AOR for the period January 2019 through February 2021. Coast Guard categorized RFF sites in Alaska into three conditions of availability during each month:

- Fully Functional – sites with at least 97 percent functionality;[17]
- Intermittent Outages – sites with outages between 5 to 97 percent; and
- Down – sites with less than 5 percent functionality.

Only 4 of 33 sites met the "fully functional criteria" of being at least 97 percent functional during a given month. As shown in Figure 2, during the 26-month period we reviewed, 29 sites experienced intermittent outages, with 10 reporting 3 or more consecutive months of "down" conditions with less than 5 percent functionality.

[15] In the *Rescue 21 - Alaska Functional Requirements Document*, "threshold" designates a priority requirement that was planned for the first phase of the Rescue 21 Alaska project.
[16] *Rescue 21 - Alaska, Functional Requirements Document*, Version 1.0, Apr. 5, 2012 specifies the system receipt of distress calls and emergency alerts on channel 16 and the VHF-FM voice communications shall be operationally available at least 98 percent of the total time each month.
[17] Although the Functional Requirements Document specifies 98 percent operational availability as a threshold requirement, the Coast Guard Communications Product Line unit provided the values for categorizing tower availability and considered 97 percent or greater as fully functional.

Figure 2. Coast Guard District 17 RFF Site Outages, January 2019 – February 2021



Source: DHS Office of Inspector General analysis of Coast Guard outage data

Various Factors Have Contributed to Outages

Coast Guard is, and has been, aware of the problems with Rescue 21 Alaska. Officials we spoke to acknowledged Rescue 21 Alaska outages have occurred throughout the lifecycle of the equipment. Overall, Coast Guard reorganizations, inconsistent contracting requirements, and antiquated equipment have had detrimental effects on the reliability of Rescue 21 Alaska.

Coast Guard Experienced Challenges and Delays during the Rescue 21 Alaska Acquisition

Coast Guard originally intended to replace the nationwide NDRS legacy communications system with Rescue 21, a fully integrated, command, control, and communications system to:

- monitor the international VHF-FM distress frequency;
- coordinate SAR operations; and
- communicate with commercial and recreational vessels in the commercial zone.

The original Rescue 21 acquisition plan projected an infrastructure of at least 50 RFF tower sites for Alaska, including modernizing the existing RFF sites through equipment replacement and building new RFF sites. In 2009 testimony to Congress,[18] a Coast Guard official discussed how the 50 sites would be established during a multiyear process and noted it was in the best interest of Coast Guard and Alaska's mariners to complete the project as quickly as possible.

In May 2010, Coast Guard issued the seventh revision to the acquisition plan, further documenting the division of Rescue 21 into three separate efforts. With this division, the NDRS modernization in Alaska became known as "Rescue 21 Alaska," whereas "Rescue 21 Coastal" covered the coastal zones of the contiguous United States and "Rescue 21 Western Rivers" addressed the Mississippi River area and the Ohio River Valley.

In April 2012, Coast Guard issued a Rescue 21 Alaska Implementation Prioritization memorandum,[19] specifying that Rescue 21 Alaska capabilities would be prioritized and provided to the maximum extent enabled by available funding. This memorandum referenced a previous decision to change from a "design-to-cost"[20] to a "build-to-cost"[21] approach in Alaska, meaning program funding was insufficient to deliver all the originally intended RFF sites, equipment, or operational requirements in Alaska. The memorandum revealed the original plans for Rescue 21 Alaska consisted of 68 sites — 32 legacy NDRS sites that were to receive modernization upgrades, and 36 newly constructed

[18] *111-82 Maritime Domain Awareness*, Hearing before the Subcommittee on Coast Guard and Maritime Transportation of the Committee on Transportation and Infrastructure, H.R. 111th Congress (Dec. 9, 2009) (testimony of Rear Admiral Brian Salerno, U.S. Coast Guard Assistant Commandant for Marine Safety, Security, and Stewardship).
[19] *Coast Guard Rescue 21 Implementation Prioritization Memorandum*, Apr. 5, 2012.
[20] "Design-to-cost" generally refers to setting requirements and system design that targets a set or desired cost. The Coast Guard Acquisition Plan defines "design-to-cost" as an acquisition strategy to recapitalize existing capabilities rather than install the full capability implemented in earlier phases of the Rescue 21 project when there were no target costs constraining design of Rescue 21. According to Coast Guard officials and documents, the Rescue 21 Coastal acquisition depleted most of the designated budget for Rescue 21, leaving insufficient funds to complete the acquisition of all equipment and sites originally intended for Rescue 21 Alaska.
[21] The "build-to-cost" strategy, also referred to as a "build-to-budget" in the *DHS Streamlined Acquisition Plan, Rescue 21 Alaska Sustainment 2019–2021*, was enacted due to cost concerns and led to the separation of Rescue 21 Alaska Acquisition from the larger, more costly, Rescue 21 Coastal.

sites. But by contrast, the April 2012 Functional Requirements Document[22] provided for upgrades to approximately 13 sites and construction of only 3 new sites and provided capabilities to the "most impactful areas." Coast Guard aimed to improve capabilities, but with the cost concerns, the prioritization resulted in multiple equipment configurations with continued use of antiquated, but still functional, equipment at sites rather than a standard configuration of updated equipment.

Coast Guard officials described how budget limitations and Coast Guard's cost underestimations affected the amount and type of work conducted for Rescue 21 Alaska and stated that equipment was purchased only after the needs of Rescue 21 Coastal were met. In the switch to a "build-to-cost" approach, Coast Guard also defined new, limited requirements for Rescue 21 Alaska system performance, including eliminating the direction-finding capabilities[23] acquired for Rescue 21 Coastal. Coast Guard advertised the modified Rescue 21 Alaska system as a more cost-effective and realistic solution given the state's unique environment, as Alaska has weather, terrain, power, and bandwidth challenges.

With the separation also came capability distinctions and variations in maintenance expectations. In revising the acquisition strategy, Coast Guard focused on affordability while reducing the minimum coverage requirement in Alaska as compared to Rescue 21 Coastal. Rescue 21 Coastal provides a minimum 90 percent continuous coverage for reception, but the coverage requirement for Rescue 21 Alaska is limited to less than 30 percent. Also, the Rescue 21 Alaska contract allows as long as 21 days for a repair response in contrast to the 24-hour response time required by Rescue 21 Coastal. Officials again cited Alaska's unique operating environment, terrain, and weather constraints as the reason for the increased repair timeline and reduced coverage area requirements.

In a September 29, 2017 memorandum discussing attainment of full operational capability for Rescue 21, Coast Guard noted acquisition program funding fell short of delivering all the original intended operational requirements in Alaska, but stated the requirements were deferred, not canceled. Ultimately, Rescue 21 Alaska acquisition efforts led to some network upgrades, and the establishment of a Digital Selective Calling (DSC)[24] system,

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[22] *Rescue - 21 Alaska, Functional Requirements Document*, Version 1.0, Section 1.3, Apr. 5, 2012.

[23] Direction finding capability provides Coast Guard search and rescue responders with lines of bearing to assist in locating vessels in distress.

[24] DSC provides ship-to-ship and ship-to-shore communications and allows mariners to send automatically formatted, non-voice distress alerts to the Coast Guard. DSC calls may be broadcast or direct calls to other DSC equipped ships and shore units. VHF DSC is monitored by Coast Guard District 17 Sector communications watch.

remote radio control consoles, and an Echo Mitigation System.[25] However, the incomplete modernization of antiquated NDRS equipment impacted the region and Alaska mariners once outages started.

Coast Guard Declared Rescue 21 Alaska Complete Even Though Equipment Failed Some Critical Operational Effectiveness Tests

Coast Guard completed acquisition of the Rescue 21 Alaska program when it formally accepted the third and final newly built tower in October 2017, effectively transitioning the program from the acquisition to the sustainment phase.

Coast Guard District 17 Instruction 2000.1C declares the operational readiness of communications systems and equipment is critical for mission success; thus, it is imperative to regularly conduct proper system verification and quality control tests.[26] In January 2017, prior to completion and acceptance of Rescue 21 Alaska, Coast Guard's Operational Test and Evaluation Force issued its final report on the system. It tested the system over a 12-day period to determine the operational effectiveness, operational suitability, and readiness for Coast Guard District 17 fielding. The report indicated Rescue 21 Alaska was operationally effective, but identified unresolved system deficiencies related to operational suitability, reliability, and availability.[27] Some of the unresolved deficiencies were related to the system not providing a continuous and uninterrupted monitoring of VHF-FM Channel 16 voice communications and failure to reach the minimum number of operating hours required for reliability and availability. Further, Coast Guard conducted the tests in August, when the system was not challenged by Alaska's harsh winter environment. The evaluation report included recommendations for further testing of the system, including testing of all RFF sites in the winter.

According to a Coast Guard official, infrastructure problems were known during the Rescue 21 project acquisition phase. One such issue involved the use of solid oxide fuel cells at three RFF sites. The solid oxide fuel cell equipment was originally tested under limited conditions and produced satisfactory power generation through an entire Alaska winter season. However, when Coast Guard asked the manufacturer to upsize and scale

[25] The Echo Mitigation System, developed and deployed to Rescue 21 Alaska by GL Communications Inc., consists of hardware that calculates audio stream delays and ensures they arrive at the end site with the recipient hearing clear, echo-free audio.
[26] *Supplement 3 to COMPACAREA Annex Kilo, Command, Control, and Communications, Seventh District Instruction 2000.1C*, pp. S-3-19, Apr. 2018.
[27] *Rescue 21 Alaska Operational Test Agency Evaluation Report, OT-C1 Final Report to the United States Coast Guard Assistant Commandant for Capability (CG-7) and Program Executive Officer (CG-93), COMOPTEVFOR 3980 (3000-240V-OT-C1) Ser 00/08*, pp. 1–3, Jan. 2017.

equipment to deploy outside of the test environment, it proved to be unreliable at generating enough power to operate at the RFF sites. The solid oxide fuel cells are present at Duffield, Middle Cape, and Deception Hills RFF sites, all of which have experienced sustained outages.[28]

Furthermore, in August 2018, prior to the increased media attention and congressional inquiries about the VHF-FM Channel 16 outages, Coast Guard conducted an operational analysis of Rescue 21,[29] including Rescue 21 Alaska[30] in which it examined whether the system:

- continued to meet established requirements;
- continued to deliver intended capabilities;
- could more effectively provide capabilities by other means; and
- should be improved or replaced.

The resulting report concluded that Rescue 21 Alaska was not meeting stakeholder expectations or needs for functionality and performance. Pointing to the limited Rescue 21 Alaska project scope, the report noted that some infrastructure was not updated and was left in "varying degrees of repair," and thus is unreliable and inconsistent. The repair timeframes for RFF sites are dictated by weather, location, and severity of the equipment casualty. Although weather and remote locations of the RFF sites increase the time of repairs, Rescue 21 Alaska also lacks a remote monitoring system at some RFF sites. Coast Guard officials attributed outages to aging equipment, specifically generators and microwaves, which can be single points of failure due to limited Alaska infrastructure. Also, multiple officials we interviewed described difficulty finding personnel with the skillsets to repair communications equipment, especially the legacy NDRS pieces.

When the Coast Guard created Rescue 21 Alaska in 2007, it established the Rescue 21 Alaska Project Resident Office in Juneau, staffed with Coast Guard and civilian personnel, including implementation/construction Contracting Officer's Technical Representatives. Alaska-based staff were responsible for all contracts associated with Rescue 21 Alaska. In 2013, Coast Guard transferred responsibility for Rescue 21 Alaska contracts to its office in Portsmouth, Virginia, and changed from an Alaska-based contractor to a Virginia-based contractor. A Coast Guard official stated that proper equipment maintenance

[28] See Figure 2, which shows Duffield and Deception Hills experienced more outages than any other RFF sites, while Middle Cape ranked eighth for amount of outage time between January 2019 and February 2021.
[29] *Coast Guard Rescue 21 Operational Analysis Report,* Aug. 15, 2018, conducted per the *Coast Guard Major Systems Acquisition Manual, COMDTINST M5000.10.*
[30] The August 2018 Operational Analysis addressed the same objectives for all Rescue 21 systems, including Coastal, Western Rivers, and Alaska. For this report, we only examined the information pertaining to Rescue 21 Alaska.

started to decline after the switch from one contractor possessing depth of experience and knowledge of the operating environments to one lacking such expertise. Further, the new contract did not provide for quality assurance evaluators to travel with the contractors to perform maintenance. This increased the knowledge gap during RFF site repairs. In addition to the challenges brought on by weather, environment, and aging equipment infrastructure, a knowledge deficit among those contracted to maintain the system may have contributed to increased communications outages.

VHF Communication Outages Contributed to Dangerous Incidents in Alaska Waterways and Expended Coast Guard Resources

When an RFF site is down, Coast Guard personnel may be unaware or unable to communicate with a mariner or vessel experiencing distress. In some instances, District 17 will deploy assets such as a helicopter, aircraft, or vessel to conduct SAR operations even though they are uncertain of the exact circumstances of the distress. As a result, the Coast Guard sometimes unnecessarily deploys equipment to conduct SAR operations or, in other cases, misses the opportunity to conduct SAR operations altogether.

District 17 referred to these deployments as "near misses" if any of the following conditions were met:

- Distress broadcasts on VHF-FM Channel 16 were never heard due to RFF site outages or lack of VHF coverage in sea area.
- Operational resources had to be used to perform the duty of an RFF tower.
- Coincidental good Samaritan involvement was critical to conducting SAR efforts whereby the Coast Guard would have never been alerted.

The Coast Guard monitors VHF-FM Channel 16 for distress signals from mariners in peril or others experiencing emergency situations.[31] Mariners rely on VHF-FM Channel 16 for communicating with Coast Guard and have an expectation that Coast Guard will hear and respond to their calls for help. When the Coast Guard is unable to hear a distress call because of an RFF site outage, potentially dangerous situations occur for those operating in the area supported by the downed site. For example, in August 2019, Coast Guard missed seven distress calls because of RFF site outages. In one such "near miss" incident, mariners in a disabled vessel and unaware of outages described trying to hail the Coast Guard for more than 30 minutes with no results.

[31] Coast Guard also monitors HF frequency 4125 Kilohertz for distress signals. However, this report focuses on VHF communications and the outages affecting those communications.

Further, when the Coast Guard deploys equipment in support of SAR missions, there are associated operating costs.[32] According to Coast Guard data, between July 18, 2019 and February 11, 2021 there were 13 instances of assets deployed due to Rescue 21 Alaska equipment-related communications outages. The cost for these additional deployments was almost $430,000,[33] and in some instances, assets were diverted from other missions. Table 1 summarizes the equipment types, additional operating hours, and associated costs.

Table 1. Costs of Coast Guard Asset Deployments due to VHF Communications Outages, July 18, 2019 to February 11, 2021

Coast Guard Asset Type	Hours Expended	Associated Cost
C130 Aircraft	22	$281,754.00
MH-60 Helicopter	12.2	$134,254.60
225 Seagoing Buoy Tender Vessel	2	$13,976.00
TOTAL	**36.2**	**$429,984.60**

Source: DHS OIG analysis of Coast Guard-provided data

Mariners in Alaska Perceive the Outages as Increasing since 2019

In response to our questionnaire,[34] mariners reported they did not recall widely experiencing outages prior to 2019, with 48 percent of respondents (15 of 31) indicating outages seem to have increased since 2019. One mariner commented, "[h]istorically outages were localized and brief." However, recent outages span a wider area and an extended period of time.

When notifying the public of outages, Coast Guard routinely advised mariners to have other means of emergency communication, such as cellular phones, available. Mariners nonetheless rely on VHF-FM radio, with 29 of 31 respondents (94 percent) stating they typically use VHF-FM radio to contact the Coast Guard with distress calls. Additionally, 22 of 31 (71 percent) answered, "no" when asked if the other ways to obtain help from the Coast Guard were as effective as calling on VHF-FM Channel 16. According to a 2013 Commandant instruction,[35] cellular phones have serious limitations and are not as valuable to SAR operations as VHF-FM is. Officials and mariners we spoke to described cellular phone service in Alaska as being spotty and unreliable, and only

[32] The Coast Guard's Operating Costs are listed in *Commandant Instruction 7310.1T Reimbursable Standard Rates*, Nov. 29, 2018, and *Commandant Instruction 7310.1U Reimbursable Standard Rates*, Feb. 27, 2020.
[33] When calculating the costs of asset deployments, we used the *Commandant Instruction 7310.1U Reimbursable Standard Rates* corresponding with the date of the incident.
[34] *See* Appendix C.
[35] *U.S. Coast Guard Addendum to the United States National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual*, Commandant Instruction M16130.2F, January 2013. https://www.hsdl.org/?abstract&did=748220.

working near shorelines. Although DSC is another method of distress communication, it does not allow voice communications, thus limiting the details mariners can share about a distress situation.

In some cases, mariners may not have alternate means of emergency communication available, as they have long relied on VHF-FM Channel 16 as their mode of communication with the Coast Guard. As a result, Coast Guard and Alaska mariners may be forced to rely on good Samaritans to intervene when mariners are in distress.

Coast Guard Is Upgrading Some Equipment and Plans for Future Upgrades and Modernization

Coast Guard officials maintain that old equipment at some sites is the primary cause of outages. To mitigate outages and increase operational availability of Rescue 21 Alaska, Coast Guard has contracted to replace antiquated NDRS equipment at RFF sites. Generally, RFF sites consist of microwave links, generators, radios, and antennas.

To plan upgrades, troubleshoot, and conduct equipment maintenance, Coast Guard requires accurate engineering drawings of each of the Rescue 21 Alaska RFF sites. Although not a direct system upgrade, information provided by Coast Guard indicates it entered a contract in September 2020 with a nearly $10 million ceiling[36] to obtain engineering drawings for 17 of 33 RFF sites. The new and accurate drawings are intended to replace outdated and uncomprehensive drawings and to facilitate future equipment repairs and replacement.

Because of the mountainous terrain and little to no internet coverage, 27 of the 33 Rescue 21 Alaska RFF sites require microwave links to relay radio signals. As of October 2020, 22 of those sites were equipped with obsolete microwave links with no available spare parts. Information provided by the Coast Guard indicates it signed an approximately $4 million contract to replace microwave equipment at 18 sites; installation is scheduled for 16 sites in summer 2021 and 2 sites in summer 2022.

The Coast Guard Office of Civil Engineering is responsible for generators at RFF sites in District 17 and has also entered into contracts to replace and repair both antiquated NDRS equipment and some equipment that was installed during the Rescue 21 Alaska acquisition phase. Between February

[36] This contract included engineering drawings for 17 Rescue 21 Alaska RFF sites and "installation and removal of equipment" at unspecified sites. We were unable to determine the final cost of this contract, as we examined only the documents establishing the contract, and it was still being executed at the time of our fieldwork.

2019 and September 2020, Coast Guard obligated more than $7.2 million to repair or replace generators at RFF sites. Table 2 lists the contracts, including cost and dates, associated with generator repairs at District 17 RFF sites.

Table 2. Contracts for Generator Repairs at District 17 RFF Sites

Project Type	RFF Sites	Date Awarded	Amount
Generator Repairs	Duffield Peninsula	2/12/2019	$86,040
Generator Replacements	Duffield Peninsula	12/11/2019	$495,000
Generator Replacements	Rugged Island, Pt. Pigot, and Bede Mountain	6/22/2020	$3,224,712
Pre-proposal Site Reconnaissance	Althorp Peak, Sitkinak, and Sukkwan Island	7/16/2020	$83,370
Generator and Generator Shelter Replacements	Althorp Peak, Sitkinak, and Sukkwan Island	9/17/2020	$3,352,828
Total			**$7,241,950**

Source: DHS OIG analysis of Coast Guard-provided information

Coast Guard officials report Rescue 21 Alaska will be more reliable upon completion of the microwave and generator replacement projects, as they will no longer need to replace full site components and will only have to maintain the system. In addition, Coast Guard is planning modernization efforts for technology improvements at RFF sites to enhance communication capabilities. Although the plan is in the early stages, officials shared that, once complete, the modernization efforts will standardize radios at all 33 Rescue 21 Alaska RFF sites, resulting in a supportable Internet Protocol-based solution that will enhance communication capabilities between Coast Guard and the public.

Also, Coast Guard appears to regularly engage with the public about its efforts to fix outages. In briefings with local stakeholders, Coast Guard officials shared plans for fixing faulty equipment. In response to our questionnaire, 55 percent of stakeholders stated they were aware of the Coast Guard's efforts to fix VHF outages, but one concerned mariner noted the "band aid approach" is not delivering what the public expects and deserves.

Coast Guard Could Improve Its Notifications to the Public about Communication Outages Impacting Mariner Safety

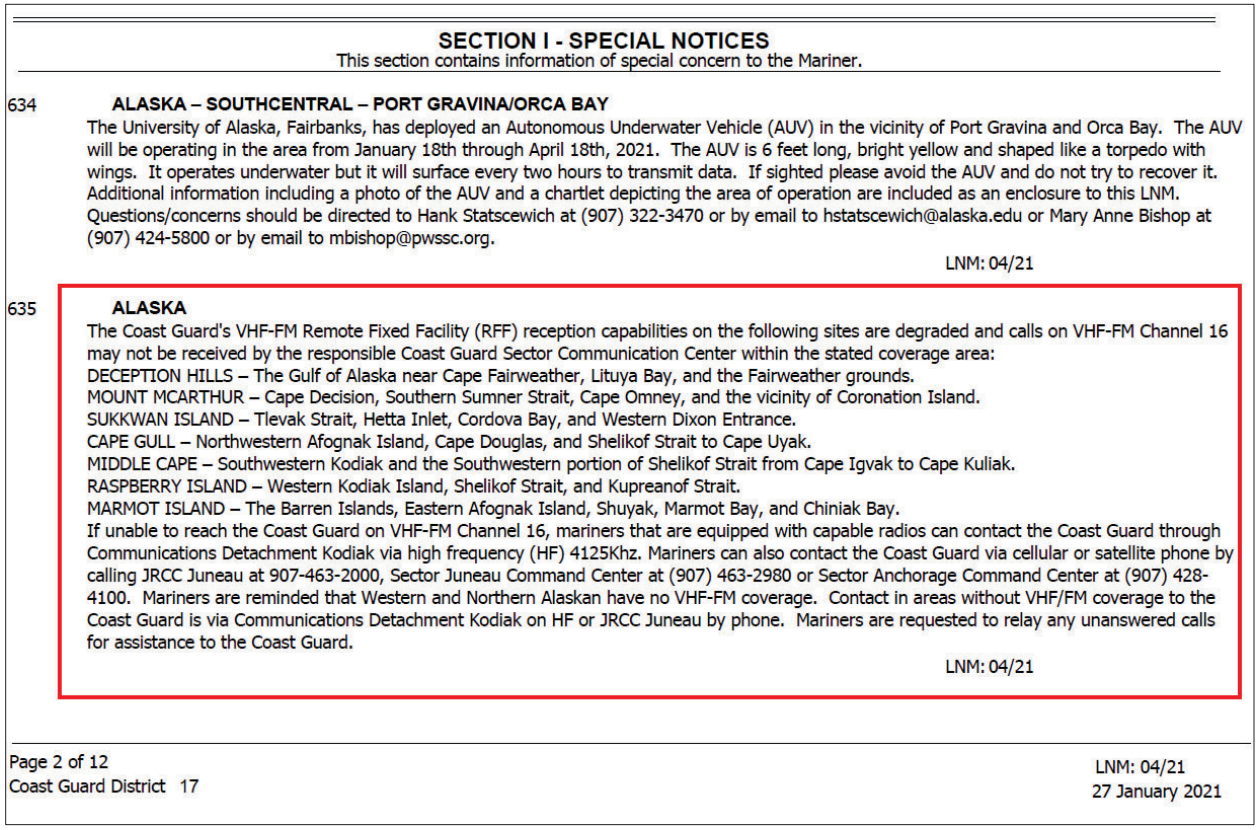
It is essential the Coast Guard notify the maritime community of changes or outages in distress, safety, and broadcast operations.[37] We examined outage notifications Coast Guard made to the public from January 2019 to April 2021 to determine whether it was appropriately notifying the public about the outages in District 17. We found District 17 used various notification types to inform the public of RFF site outages impacting its ability to receive distress calls on VHF-FM Channel 16, but primarily relied on a Local Notice to Mariners (LNM), a weekly report published to the Coast Guard website. In response to our questionnaire, local mariners suggested additional notification methods.

Limitations Exist with Coast Guard's Local Notices to Mariners

The LNM is typically longer than 20 pages and contains information of interest to mariners, such as changes or updates to navigation aids or RFF site outages. The LNM is released only once per week. Therefore, it does not always contain real-time, accurate information about outages. Further, from January to mid-October 2019, Coast Guard did not specify which RFF sites were experiencing outages. Rather, the LNM listed the general region that was experiencing communication outages. In mid-October 2019, Coast Guard began naming specific RFF sites experiencing outages, as shown in Figure 3. Coast Guard officials we interviewed noted the communication outages in District 17 occurred prior to 2019, but the Coast Guard increased notifications after the issue received media coverage.

[37] *United States Coast Guard Telecommunication Manual,* COMDTINST M2000.3F, p. 11-4, Apr. 2013.

Figure 3. Excerpt from the January 27, 2021 Local Notice to Mariners



SECTION I - SPECIAL NOTICES
This section contains information of special concern to the Mariner.

634 **ALASKA – SOUTHCENTRAL – PORT GRAVINA/ORCA BAY**
The University of Alaska, Fairbanks, has deployed an Autonomous Underwater Vehicle (AUV) in the vicinity of Port Gravina and Orca Bay. The AUV will be operating in the area from January 18th through April 18th, 2021. The AUV is 6 feet long, bright yellow and shaped like a torpedo with wings. It operates underwater but it will surface every two hours to transmit data. If sighted please avoid the AUV and do not try to recover it. Additional information including a photo of the AUV and a chartlet depicting the area of operation are included as an enclosure to this LNM. Questions/concerns should be directed to Hank Statscewich at (907) 322-3470 or by email to hstatscewich@alaska.edu or Mary Anne Bishop at (907) 424-5800 or by email to mbishop@pwssc.org.

LNM: 04/21

635 **ALASKA**
The Coast Guard's VHF-FM Remote Fixed Facility (RFF) reception capabilities on the following sites are degraded and calls on VHF-FM Channel 16 may not be received by the responsible Coast Guard Sector Communication Center within the stated coverage area:
DECEPTION HILLS – The Gulf of Alaska near Cape Fairweather, Lituya Bay, and the Fairweather grounds.
MOUNT MCARTHUR – Cape Decision, Southern Sumner Strait, Cape Omney, and the vicinity of Coronation Island.
SUKKWAN ISLAND – Tlevak Strait, Hetta Inlet, Cordova Bay, and Western Dixon Entrance.
CAPE GULL – Northwestern Afognak Island, Cape Douglas, and Shelikof Strait to Cape Uyak.
MIDDLE CAPE – Southwestern Kodiak and the Southwestern portion of Shelikof Strait from Cape Igvak to Cape Kuliak.
RASPBERRY ISLAND – Western Kodiak Island, Shelikof Strait, and Kupreanof Strait.
MARMOT ISLAND – The Barren Islands, Eastern Afognak Island, Shuyak, Marmot Bay, and Chiniak Bay.
If unable to reach the Coast Guard on VHF-FM Channel 16, mariners that are equipped with capable radios can contact the Coast Guard through Communications Detachment Kodiak via high frequency (HF) 4125Khz. Mariners can also contact the Coast Guard via cellular or satellite phone by calling JRCC Juneau at 907-463-2000, Sector Juneau Command Center at (907) 463-2980 or Sector Anchorage Command Center at (907) 428-4100. Mariners are reminded that Western and Northern Alaskan have no VHF-FM coverage. Contact in areas without VHF/FM coverage to the Coast Guard is via Communications Detachment Kodiak on HF or JRCC Juneau by phone. Mariners are requested to relay any unanswered calls for assistance to the Coast Guard.

LNM: 04/21

Page 2 of 12
Coast Guard District 17

LNM: 04/21
27 January 2021

Source: Image retrieved from Coast Guard website

When comparing the outages reported in the LNMs with the "near miss" data for July 2019 to February 2021, we determined that 27 of 28 "near miss" incidents occurred in areas where the LNM reported the RFF site or coverage region as experiencing degraded capabilities. For example, the "near miss" log referenced the Zarembo Island RFF outages in eight incidents from July to November 2019. LNMs for that time period and for two additional months reported the Zarembo RFF outages. According to a Coast Guard official, the RFF experienced intermittent outages from June to September 2019 and was down from October to December 2019, and although the information was reported in the LNM, mariners, nonetheless, experienced dangerous incidents in the outage areas.

Coast Guard Uses Broadcast Notices to Mariners and Other Means of Notification Less Frequently

The *Coast Guard Telecommunication Manual* states changes or casualties to services or capabilities expected to last more than 7 days shall also be published and posted via Broadcast Notice to Mariners (BNM), with anticipated

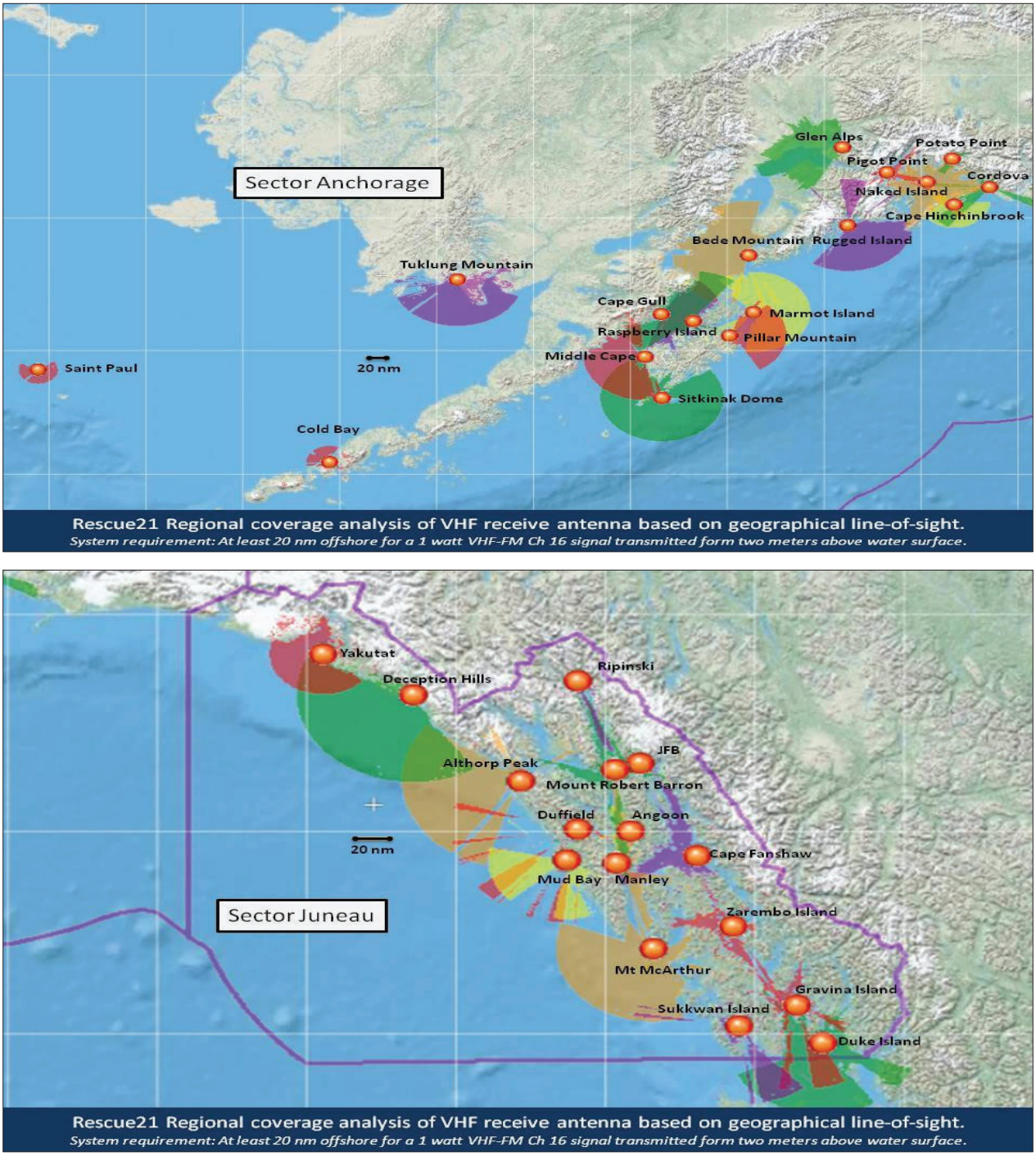
date of service restoral.[38] In addition to LNMs, District 17 uses the BNM to communicate VHF outages or other immediate issues to the boating public by broadcasting information on a schedule, continuing for as long as needed. The BNM, according to a Coast Guard official, is a quick way to convey real-time outage information to mariners. However, BNMs are transmitted over VHF and may not reach those mariners in an area affected by RFF site outages. One respondent to our questionnaire explained mariners may deduce a communication outage is occurring if they no longer hear the BNMs in an area where they are typically heard; so, by *not* hearing the notice, mariners sometimes understand that Coast Guard VHF communications are down. Coast Guard also publishes BNMs from four of nine districts[39] on their website, but the notices for District 17 are not among those published. Making these notices available online for District 17 stakeholders could help mariners plan and receive updates for navigational hazards.

In addition to the weekly LNMs and the situational BNMs, Coast Guard notifies the public of outages using other methods, such as social media, news releases, briefings, media interviews, and emails sent to distribution lists. Each method was used infrequently, as Coast Guard primarily relies on the LNM to disseminate outage information. From October 2019 to February 2021, Coast Guard published five news releases and briefed members of various Alaskan fishermen's groups and associations. Some briefings were provided as outreach initiatives to associations as the Coast Guard was aware of the groups' increasing interest, while other briefings were requested by other organizations and associations.

In February 2020, the Coast Guard began emailing periodic status updates to relevant stakeholders, including local government officials, news outlets, and Alaska fishermen's associations. The emails contained links to maps showing locations of RFF sites in Alaska, as shown in Figure 4. In September 2020, Coast Guard began including the link for the weekly LNM in the emails.

[38] *United States Coast Guard Telecommunication Manual,* COMDTINST M2000.3F, 11–5, Apr. 2013.
[39] BNMs are publicly available for Coast Guard Districts 1, 5, 8, and 13. Districts 7, 9, 11, 14, and 17 are shown as "coming soon" on Coast Guard's website: https://www.navcen.uscg.gov/bnmmessages/index.html.

Figure 4. RFF Site Coverage Maps Linked in Emails Sent by Coast Guard[40]



Source: Coast Guard District 17 External Affairs Office e-mails (Feb. 1, 2021 – Mar. 19, 2021)

[40] A Coast Guard External Affairs representative stated there was no significance to the colors related to depicting the coverage ranges. Rather, they were likely chosen to differentiate sites.

From January to October 2020, the District 17 External Affairs Office received and responded to 16 emails from local stakeholders requesting briefings or information about the RFF outages. However, in response to our questionnaire, one fishing organization member remarked the Coast Guard did not promptly inform the public regarding the outages, as they only began after members of the organization raised the issue with local media. Other organization representatives were unaware of the ongoing email updates.

The District 17 External Affairs Office has used social media to connect with the public, though VHF outages are not regularly advertised on any specific or primary social media platform, and there were only five Facebook posts and four Twitter posts from October 2019 to February 2021. A Coast Guard official explained using Facebook to update the frequent online and offline statuses of the towers would be overkill and staff have yet to explore using Twitter to regularly share outage information. This assessment was supported by our questionnaire results as we only received two responses in favor of Coast Guard increasing social media usage to communicate outage information. Coast Guard officials in District 17 also considered establishing a website to advertise outages in real time, but the idea was thwarted because staff did not have the expertise to pursue the initiative.

Coast Guard Has Made Efforts to Expand Outage Notifications

Coast Guard understands the importance of making the public aware of when and where communications outages occur and has efforts underway to expand its public notifications. According to the Alaska Marine Exchange (MXAK),[41] it has developed and maintained a comprehensive system of more than 130 Marine Safety Sites (sites) to provide critical communication, vessel tracking, and real-time weather reports along the Alaskan shorelines. MXAK aims to use the sites to create redundant and exclusive VHF coverage.

Coast Guard contracted with MXAK to examine the possibility of using Automated Identification System (AIS)[42] in the Western Northern coastal regions where there is no VHF coverage, but may also use it to notify of VHF

[41] MXAK is a non-profit organization that aims to use its expertise to assist the maritime community to comply with state and Federal safety, security and environmental regulations, enhancing maritime safety and environmental protection, aiding in the response to emergencies, and saving the lives of mariners.

[42] AIS is a maritime navigation safety communications system standardized by the International Telecommunication Union and adopted by the International Maritime Organization. It provides vessel information, including the vessel's identity, type, position, course, speed, navigational status, and other safety-related information automatically to appropriately equipped shore stations, other ships, and aircraft; receives automatically such information from similarly fitted ships; monitors and tracks ships; and exchanges data with shore-based facilities. 33 Code of Federal Regulations (C.F.R.) § 164.46.

outages in areas where there should be coverage. Coast Guard is testing AIS feasibility in Alaska by communicating with its own vessels using direct messaging.[43] AIS allows the Coast Guard to receive and transmit short,[44] safety-related messages any time and can be used to communicate when VHF towers are down to supplement the outage notifications published in the weekly LNMs. A Coast Guard official said the AIS will be an effective way for the Coast Guard to expand its capability to notify mariners about VHF outages and to communicate with vessels. The official said, for Coast Guard to use AIS as an alternate means of outage notification, District 17 would need more funding and Headquarters-level approvals.

Local Mariners Suggest Coast Guard Use Other Methods to Report Outages

VHF-FM Channel 16 is the communication mode Coast Guard and mariners have relied on for maritime safety for decades. According to questionnaire respondents, local mariners view the VHF radio communications system as their "lifeline." In our questionnaire, we asked mariners and local organizations which, if any, methods the Coast Guard should consider using to notify the public of VHF distress signal outages. We received various answers, but the most common response was that local radio station broadcasts of outage notifications would be useful. Overall, 12 of 31 (39 percent) of respondents recommended the use of radio broadcasts to communicate outages, with some also suggesting the use of newspaper, social media, and television broadcast news. Other respondents suggested DSC, AIS, and emails as notification alternatives.

Conclusion

VHF communication outages have persisted for several years in Coast Guard's District 17 and have contributed to dangerous incidents in Alaska waterways. Notwithstanding Coast Guard's scaling back the number of new RFF sites in the District 17 AOR from 36 to 3, much of the legacy NDRS equipment remains in use. The efforts to replace antiquated equipment, modernize the Rescue 21 Alaska infrastructure, and ensure operational availability of equipment demonstrate that Coast Guard understands the importance of keeping VHF-FM Channel 16 available to mariners. Nevertheless, as multiple officials pointed out, even if all the Rescue 21 Alaska sites were fully functional, there is still limited coverage in the Alaska region.

[43] AIS allows for direct messaging to a specific vessel using a unique identifier or broadcasting a message to all vessels within range of the transmitter.
[44] AIS messages consist of up to 85 characters and can be transmitted from ship-to-ship or shore-to-ship.

Some mariners noted in our questionnaire a reduced confidence in the Coast Guard and its ability to assist, if needed, with 49 percent of respondents indicating they are aware of instances in which mariners could not contact the Coast Guard because of VHF distress signal outages in Alaska. To achieve its SAR mission in Alaska, it is essential for Coast Guard to adequately upgrade its communications equipment and ensure robust attempts are made to notify the public when outages occur.

Recommendations

Recommendation 1: We recommend the Commandant of the United States Coast Guard prioritize funding and purchasing of the appropriate technology needed to ensure full operational capability of Rescue 21 Alaska.

Recommendation 2: We recommend the Commander of Coast Guard District 17 in Alaska develop and implement a plan to use additional methods to notify the public of VHF communications coverage outages in the District 17 area of responsibility.

Management Comments and OIG Analysis

Coast Guard concurred with both recommendations. Coast Guard described corrective actions to address the issues identified in this report. Appendix B contains Coast Guard management comments in their entirety. We also received technical comments to the draft report and revised the report as appropriate. We consider both recommendations resolved and open. A summary of Coast Guard's response and our analysis follows.

Coast Guard Comments to Recommendation 1: Concur. Severe weather, remote and inhospitable terrain, contractor availability, and hardware obsolescence continue to challenge recapitalization of R21 AK. The Assistant Commandant for Command, Control, Communications, Computers, and Information Technology, however, continues to sustain legacy R21 AK systems, while implementing a longer-term solution to replace power generation, microwave data link, radio, and network infrastructure systems. Additional resources accelerated the system modernization timeline, including the capacity for Coast Guard to visit, troubleshoot, and repair casualties at R21 AK RFFs. The long-term solution is to modernize the VHF communication reliability according to a three-phase modernization plan. Coast Guard described the three phases, including a fully funded plan to replace microwaves and generators, a partially funded plan to replace VHF radios, and a future plan to replace obsolete network infrastructure equipment. Estimated Completion Date (ECD): August 30, 2024.

OIG Analysis: We consider these actions responsive to the recommendation, which is resolved and open. We will close this recommendation when we receive documentation showing Coast Guard has fully funded Phases 1 through 3 of the Rescue 21 modernization plan outlined in the management response.

Coast Guard Comments to Recommendation 2: Concur. Coast Guard initiated several efforts to address R21 AK VHF coverage gaps with regard to communication and outreach, and District 17 will continue to use additional methods to communicate Rescue 21 AK outages to the Alaskan maritime community. Coast Guard noted broadcasting real-time Rescue 21 Alaska outage notifications over VHF may not be possible in remote areas because the transmissions would be made from the same facilities experiencing the outages. District 17 will continue to pursue alternate notification methods, such as e-mail distribution lists, radio station and news broadcasts in areas covered by RFF sites that periodically lose VHF coverage. Coast Guard stated posting the BNMs to a public website for mariners is a best practice. District 17 will continue to pass operational updates through alternate means of communication regardless of VHF tower status, as part of its ongoing "prevention first" boating safety strategy.

OIG Analysis: We consider the actions Coast Guard described responsive to the recommendation, which is resolved and open. Although Coast Guard described actions taken and a plan to pursue additional methods of communicating with the public about VHF communications coverage outages in the District 17 area of responsibility, the response does not outline Coast Guard's plan or implementation strategy. We will close this recommendation when Coast Guard provides documentation showing a plan to use additional methods to notify the public of VHF communications coverage outages in the District 17 area of responsibility and details of how they intend to implement the plan.

Appendix A
Objective, Scope, and Methodology

The Department of Homeland Security Office of Inspector General was established by the *Homeland Security Act of 2002* (Public Law 107–296) by amendment to the *Inspector General Act of 1978*.

We conducted this review to determine whether the Coast Guard is adequately addressing widespread outages of distress signals and conducting appropriate notifications about outages to reduce the risk of loss of life or property. Given the inherent risks associated with on-site inspection during the COVID-19 pandemic, we performed our work remotely.

To achieve our objectives, we conducted interviews with pertinent Coast Guard officials, and we reviewed and analyzed DHS and Coast Guard directives, guidance, policies, procedures, documents and communications related to the acquisition, sustainment, maintenance, repair, and public notification for VHF radio outages of the Rescue 21 Alaska communications system.

We reviewed all Coast Guard documentation regarding missed opportunities to respond to SAR incidents referred to as "near misses." We analyzed the data related to "near misses" and determined the operating costs associated with the deployment of Coast Guard equipment in support of SAR missions. Additionally, we reviewed relevant background information and searched relevant databases and the internet for prior reports related to Rescue 21, Rescue 21 Alaska, and Coast Guard District 17 RFF site equipment outages, degraded capabilities, and communication failures.

To determine whether Coast Guard is adequately addressing widespread outages of distress signals, we reviewed contracts related to technical evaluation, maintenance, and new equipment installation of the Rescue 21 Alaska communications system. We also examined contract specifications, information about work performed, and outcomes related to repair of the system. Additionally, we obtained planning documents, maintenance contracts, and acquisition plans to replace the communication towers in Alaska.

To assess whether Coast Guard is issuing appropriate notifications about outages to reduce the risk of loss of life or property, we examined all information collected from information requests to include emails, press releases, social media posts, congressional correspondence, and other documentation associated with the communication of outages and degraded capabilities.

We also disseminated a questionnaire, *USCG VHF Distress Outages Questionnaire*, via email to the Alaskan mariner community to understand how the Coast Guard communicates with the public about VHF outages and how the outages affect stakeholders in District 17. The questionnaire contained 13 general questions and combined both opened-ended and closed-ended questions. We included optional space for the open-ended questions to collect write-in answers from respondents.

The questionnaire was made available between March 16 and April 14, 2021. The questionnaire was initially disseminated to 29 email addresses selected from an email distribution list used by the District 17 External Affairs Office to inform local government, mariners, fishermen groups, municipalities, and news media outlets of communication outages. In response to requests from Alaska fishing organization members, we extended the original deadline for responses from March 31 to April 14. We received 31 completed questionnaires and analyzed the feedback to identify common themes and perspectives shared among questionnaire participants.

We conducted this review between January and April 2021 under the authority of the *Inspector General Act of 1978*, as amended, and according to the *Quality Standards for Inspection and Evaluation* issued by the Council of the Inspectors General on Integrity and Efficiency.

Appendix B
Coast Guard Comments to the Draft Report

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

2703 Martin Luther King, Jr. Ave SE
Washington, DC 20593-7000
Staff Symbol: CG-8
Phone: (202) 372-3533
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7500
SEP 10 2021

MEMORANDUM

From: M. J. Feder, RDML 09/09/21
COMDT (CG-8)

Reply to Attn of: Audit Liaison
LTJG S. M. Vignola
(202) 372-3533

To: Joseph V. Cuffari, Ph.D.
Inspector General

Subj: DHS OIG DRAFT REPORT: "COAST GUARD SHOULD PRIORITIZE UPGRADES TO RESCUE 21 ALASKA AND EXPAND ITS PUBLIC NOTIFICATIONS DURING OUTAGES"

Ref: (a) OIG Project No. 20-030-SRE-USCG

1. Thank you for the opportunity to comment on this draft report. The U.S. Coast Guard appreciates the work of the Office of Inspector General (OIG) in planning and conducting its review and issuing this report.

2. The Coast Guard is pleased to note OIG's recognition of the upgrades made to the Rescue 21 Alaska (R21 AK) system that are enhancing distress communication availability and reliability. The Coast Guard remains committed to modernizing Very High Frequency (VHF) communication reliability, and will continue pursuing alternate notification methods to ensure the public is aware of VHF communication coverage outages in the Seventeenth Coast Guard District (District 17) area of responsibility.

3. The draft report contained two recommendations, with which the Coast Guard concurs. Attached as the Enclosure, you will find our detailed response to each recommendation. The Coast Guard previously submitted technical comments addressing accuracy, contextual, and other issues under a separate cover for OIG's consideration.

4. Again, thank you for the opportunity to review and comment on this draft report. Please feel free to contact me if you have any questions. We look forward to working with you again in the future.

5. If you have any questions, my point of contact is LTJG Sydney Vignola who can be reached at 202-372-3535.

#

Enclosure: USCG Response to OIG Draft Report Recommendations on USCG Widespread Outages of Distress Signals in Alaska

1

COAST GUARD SHOULD PRIORITIZE UPGRADES TO RESCUE 21 ALASKA AND EXPAND ITS PUBLIC NOTIFICATIONS DURING OUTAGES

OIG Project No. 20-030-SRE-USCG

OIG recommended that the Commandant of the United States Coast Guard:

Recommendation 1: Prioritize funding and purchasing of the appropriate technology needed to ensure full operational capability of Rescue 21 Alaska.

Response: Concur. Severe weather, remote and inhospitable terrain, contractor availability, and hardware obsolescence continue to challenge the recapitalization of R21 AK. The Assistant Commandant for Command, Control, Communications, Computers and Information Technology, however, continues to sustain legacy R21 AK systems, while implementing a longer-term solution to replace power generation, microwave data link, radio, and network infrastructure systems. Additional resources accelerated the system modernization timeline, including the capacity for the Coast Guard to visit, troubleshoot, and repair casualties at R21 AK remote fixed facilities (RFF). The long-term solution is to modernize the VHF communication reliability according to a three-phase modernization plan:

Phase 1: Replace obsolete generators and microwaves at R21 AK RFFs.

a. Generators – 15 of the 22 generators were replaced thus far, and the remaining 7 sites are planned for completion in the summer of 2022. This effort is fully funded.
b. Microwaves – 7 of the 18 microwaves were replaced, and the remaining 11 sites are planned for completion in the fall of 2022. This effort is fully funded.

Phase 2: Replace obsolete VHF radios at R21 AK RFFs.

a. VHF radio recap contract is planned for contract award by December 31, 2021, and will purchase 10 units for prototyping and testing purposes. The project is expected to be completed in the summer of 2024. This effort is partially funded.
b. Motorola Radio Control System (RCS) Upgrade – The RCS is used to monitor the network on an on-going basis and proactively mitigate potential security issues. This upgrade is tentatively scheduled for the summer of 2022 pending availability of funds, which are not yet available.

Phase 3: Replace obsolete network infrastructure equipment.

a. Modernization of RFFs – This effort will replace legacy equipment with modernized network equipment, allowing sectors to remotely monitor the health of the RFF. Estimated completion for this effort is the summer of 2024, however, it is not currently funded.

Overall Estimated Completion Date (ECD): August 30, 2024.

Enclosure

OIG recommended that the Commander of Coast Guard District 17 in Alaska:

Recommendation 2: Develop and implement a plan to use additional methods to notify the public of VHF communications coverage outages in the District 17 area of responsibility.

Response: Concur. The Coast Guard initiated several efforts to address R21 AK VHF coverage gaps with regard to communication and outreach, and District 17 will continue to utilize additional methods to communicate R21 AK outages to the Alaskan maritime community. It is important to note that broadcasting real-time R21 AK outage notifications over VHF may not be possible in remote areas because those transmissions would be made from same facilities experiencing the outages. However, District 17 will continue to pursue alternate notification methods, such as e-mail distribution lists, radio station broadcasts and news organizations in the areas covered by RFF sites that periodically lose VHF coverage. Posting Broadcast Notice to Mariners to a public-facing website for mariners is also a best practice. Additionally, District 17 will continue to pass operational updates through alternate means of communication regardless of the VHF tower status, as part of its ongoing "prevention first" boating safety strategy.

ECD: TBD

Enclosure

Appendix C
Full Text of Questionnaire

Department of Homeland Security
Office of Inspector General Questionnaire
Coast Guard District 17 VHF Distress Outages

The Department of Homeland Security Office of Inspector General is conducting a review of VHF distress signal tower outages in the Coast Guard District 17 area of responsibility. This questionnaire will assist us in understanding how the Coast Guard communicates with the public about VHF distress signal outages in Alaska and how these outages impact the safety of mariners. Your responses may provide insight into how the Coast Guard can improve its communication about these outages.

We request you complete and submit your responses no later than Wednesday, March 31st. After completing the questionnaire, please click "SUBMIT" on the bottom of this form to return your responses to us via email. Should you have any questions or concerns, please e-mail the project team lead at jennifer.berry@oig.dhs.gov. Thank you for your time and responses.

Do you wish to be contacted regarding this questionnaire? ◯ Yes ◯ No

Name (optional):

Phone Number (optional):

E-mail Address (optional):

Questionnaire

1. How does the Coast Guard typically inform mariners about VHF distress signal outages? (Select all that apply).
   - ☐ Email
   - ☐ News Media
   - ☐ Social Media (i.e. Facebook, Instagram, Twitter)
   - ☐ VHF Radio
   - ☐ Other (Please identify methods; If you selected more than one please indicate which occurs most often).

2. Are the Coast Guard's efforts to notify the public about VHF distress signal outages in Alaska sufficient?
   ◯ Yes ◯ No
   Why or why not?

3. What other methods should the Coast Guard consider using to notify the public of VHF distress signal outages?

4. How do mariners in Alaska typically contact the Coast Guard with distress calls?

5. What other methods are available for mariners in Alaska to obtain help from the Coast Guard besides calling on VHF Channel 16?

6. Are other ways of obtaining help from the Coast Guard as effective as calling on VHF Channel 16?

◯ Yes ◯ No

Why or why not?

7. Are you aware of any instances in which mariners could not contact the Coast Guard because of VHF distress signal outages in Alaska? If yes, please describe.

◯ Yes ◯ No

8. Are you aware of any instances in which mariners could not contact the Coast Guard because of VHF distress signal outages in Alaska AND received assistance from other mariners? If yes, please describe.

◯ Yes ◯ No

9. Are you aware of any Coast Guard efforts to fix VHF distress signal outages in Alaska? If yes, please describe.

◯ Yes ◯ No

10. Has the severity and/or frequency of VHF distress signal outages in Alaska increased, decreased, or remained the same from 2019 to present? Please explain.

11. How have VHF distress signal outages affected mariners in the Coast Guard's District 17 area of responsibility?

12. Do you believe the Coast Guard understands the impacts of VHF distress signal outages in Alaska?

◯ Yes ◯ No

Why or why not?

13. Please use this space to share any additional information you would like us to know regarding the Coast Guard's handling of the VHF distress signal outages in Alaska.

SUBMIT

Appendix D
Office of Inspections & Evaluations Major Contributors to This Report

John D. Shiffer, Chief Inspector
Jennifer Berry, Lead Inspector
Jasmin Hammad, Senior Inspector
Ronald Hunter, Senior Inspector
Donna Ruth, Independent Referencer

Appendix E
Report Distribution

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To report fraud, waste, or abuse, visit our website at www.oig.dhs.gov and click on the red "Hotline" tab. If you cannot access our website, call our hotline at (800) 323-8603, fax our hotline at (202) 254-4297, or write to us at:

Department of Homeland Security
Office of Inspector General, Mail Stop 0305
Attention: Hotline
245 Murray Drive, SW
Washington, DC 20528-0305