

RESCUE 21 AUGMENTATION FROM SPACE



Science and Technology

PERSISTENT COVERAGE GAPS IN ARCTIC SUBVERT COAST GUARD SEARCH, RESCUE

A lack of consistent, reliable communications capabilities continues to severely limit the U.S. Coast Guard's (USCG) ability to execute search and rescue (SAR) operations in District 17 (D17) Alaska. This vast area of responsibility consists of more than 3.8 million miles of extremely remote areas and unforgiving weather and sea conditions. The existing Rescue 21 (R21) maritime "911" communications system leverages terrestrial towers to receive and relay VHF distress communications to mariners. Coverage from these towers extends approximately 20 nautical miles offshore. However, the existing R21 infrastructure is plagued by frequent outages, which combined with their remote locations lacking infrastructure and harsh conditions, makes servicing them challenging and results in protracted outages. These outages undermine the ability of the Coast Guard to receive and respond to maritime distress alerts in these dangerous regions.

Infrastructure upgrades alone for the existing R21 system cannot resolve these issues. To offset the lack of infrastructure and remoteness of these expansive maritime regions, space-based infrastructure can be leveraged to augment the existing R21 system with a reliable and persistent solution to the unique challenges of this region.

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To circumvent the environmental and infrastructure challenges presented in D17, the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) is pursuing space-based capabilities. These capabilities offer persistent coverage to these remote regions without the burden of a physical infrastructure to maintain. An Analysis of Alternative completed as part of the DHS S&T Polar Scout Project concluded that spaced-based systems are the only cost-effective means of receiving and relaying maritime distress signals in the remote areas of D17.

The project will develop and test a space-based capability to address receipt and relay of the Channel 70 Digital Selective Calling (DSC) distress signals using existing on-orbit commercial capabilities. Once validated, these capabilities will transition to the USCG for operational use and will inform future R21 investments.



Blue, green, and orange portions in the map at top right represent the District 17 area of responsibility Below: map of a subsection of D17 with inlaid images of Rescue 21 towers.

OUTCOME: MORE RELIABLE DISTRESS SIGNALS FOR MARINERS

Mariners in the D17 region contend with some of the most hazardous and remote conditions in the maritime environment and must have a reliable and persistent capability for summoning aid when in distress. Recurring and prolonged outages of R21 sites in D17, combined with coverage limitations from terrestrial sensors, do not provide needed capabilities for mariners. When complete, this project will provide a persistent and reliable capability for the Channel 70 DSC distress signal to mariners in the entire D17 region without the coverage and service limitations experienced with terrestrial sensors.

DHS COMPONENT PARTNERS

USCG CG-761, CG-SAR, and District 17.