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The Nationwide Automatic Identification System Project Newsletter Issue #2 – 4th Quarter FY 2007

Welcome to the second issue of *The Guardian*, the newsletter of the U.S. Coast Guard Nationwide Automatic Identification System (NAIS) Project.

This edition includes an update on the status of Increment 1 (I-1) and Increment 2 (I-2) of the NAIS Project, summary of a recent maritime event in which NAIS played an important role, and information on the recently formed Coast Guard Acquisition Directorate (CG-9), which includes the NAIS Project Office (CG-939). Finally, as part of a continuing effort to educate readers on the NAIS Project, we explain the contents of an Automatic Identification System (AIS) message.

Project Status

Increment 1 Implementation

As of the end of Fiscal Year 2007, 79 new AIS receiver sites have been installed and 82 existing AIS sites (e.g. sites providing coverage for Vessel Traffic Services) have been incorporated into the NAIS common network to provide AIS receive coverage for 55 critical ports and 9 coastal areas across the Nation. The AIS data from these sites are feeding the Coast Guard Operations System Center (OSC) (at a rate of approximately 450 to 600 messages per second) for storage and retrieval. Additionally, the system is now being monitored 24 hours per day, 7 days per week by the Systems Operation Center (SOC) at the Coast Guard Navigation Center to ensure high availability and reliability. Operational Test and Evaluation of the system has been completed and after thoroughly reviewing the test results, we anticipate our Sponsor's approval that Full Operational Capability (FOC) was achieved on schedule.

Increment 2 Phase I Request for Proposal

Increment 2 of the NAIS Project will establish transmit capability out to 24 nautical miles and will increase receive capability to 50 nautical miles nationwide. A Request for Proposal (RFP) for NAIS Increment 2 (Phase I) is expected to be released to industry in November 2007. Once released, the I-2 RFP will be available at www.naisproject.net.

Increment 2 will be procured in two phases. The first phase will be a full and open competition awarded to a single contractor selected under best value consideration. Phase I will consist of designing, developing, integrating, testing, and implementing the core NAIS capability to provide AIS receive and transmit capability in three designated Initial Operational Capability (IOC) Sectors: Coast Guard Sectors Delaware Bay, Hampton Roads and Mobile (coastal region). Phase I will have follow-on options for the Contractor to support the Government in reaching FOC as well. The second phase is expected to be a multiple award contract for site work and installations at Coast Guard Sectors beyond IOC, necessary to establish the nationwide AIS coverage.

NAIS in Action

As noted by the following example, the information provided by NAIS is already being used by the Coast Guard in support of maritime incident investigations.

On August 30th, a medium sized oil spill impacted the southwest shorelines of Puerto Rico, affecting approximately 40 miles of coastline considered a highly sensitive ecological



environmental system for flora and fauna. The spill could potentially result in an adverse impact to the local environment and ecosystem. In addition to threatening coral reefs and mangroves, both of which support many aquatic species, the oil spill could cause harm to the Guanica Dry Forest. The Guanica Dry Forest is a biosphere reserve of 10,000 acres that is home to 48 endangered species and 16 species unique to Puerto Rico.

NAIS records were of paramount importance to identify vessels that transited the offshore area in the days leading up to the discovery of the oil. Coast Guard officials were able to replay the NAIS logs and watch the vessels transiting the area, identifying potential sources of the spill. Narrowing down to a manageable group of possible vessels derived from the NAIS data, Coast Guard officials were able to identify potential sources of the spill in order to conduct “oil fingerprinting” tests that will compare the spilled oil with the oil on each potential source to find a match.

With any case in which oil is discovered, finding the responsible party allows the government to seek recovery costs for cleanup efforts, as well as the costs of economic and environmental losses. Associated cost with similar clean up efforts could reach several million dollars, therefore, it is of paramount importance to identify any potential sources transiting the affected area. The early identification process could allow the appropriate governmental entity to recoup expenses related to the oil spill response, which alone could potentially recover much of the investment for I-1 of NAIS.

The Acquisition Directorate

The NAIS Project is one of 20 major acquisition projects in the newly formed Acquisition Directorate (CG-9). The directorate stood up in July 2007 at the leading edge of the commandant’s effort to create a full-service mission support organization by 2009. The Acquisition Directorate consolidates the following:

- Office of Acquisition (G-A)
- Program Executive Officer, Integrated Deepwater System (G-D)

- Office of Procurement Management (CG-85)
- Office of Research, Development and Technical Management (CG-66)
- Research and Development Center
- Head of the Contracting Activity (HCA)

In support of the Commandant’s vision, the acquisition community developed the [Blueprint for Acquisition Reform](#), which is strategic direction for restructuring the enterprise to strengthen procurement and contracting, and optimize the management of a \$27 billion investment portfolio. This investment portfolio supports the Coast Guard’s core missions of maritime safety, security and stewardship.

The primary mission of the Acquisition Directorate is to “acquire and deliver more-capable interoperable assets and systems that support Coast Guard operational forces in executing missions effectively and efficiently.” For more information on the new Coast Guard Acquisition Directorate, please visit: www.uscg.mil/acquisition/.

AIS Message Contents

The AIS message standard, as defined by the International Telecommunication Union, defines the structure and contents of AIS messages. The standard includes 26 different message types, each with its own purpose and capabilities. Each element of the AIS message is intended for a specific purpose, such as broadcasting a safety related message or providing a position report. Each of these message elements is broken up into many distinct sections of a defined size with each section serving a specific purpose. To illustrate this, we will be analyzing the structure of AIS Message 5: Ship Static and Voyage Related Data. This message is intended to be used by Class A shipborne mobile equipment when reporting static or voyage related data.

AIS messages are completely digital (composed entirely of 1’s and 0’s) each of which occupies one “bit.” Message 5 is exactly 424 bits long, occupies two AIS time slots, by definition, and has 15 data sections of specified lengths organized as shown in Figure 1. This construct allows for efficient data transfer and frequency use.



Figure 1 - Structure of AIS Message 5

First 6 bits	Next 30 bits	Next 30 bits	Next 2 bits	Next 30 bits	Next 42 bits	Next 120 bits	Next 8 bits	Next 30 bits	Next 4 bits	Next 20 bits	Next 8 bits	Next 120 bits	Next 1 bit	Next 1 bit
Message ID	Repeat Indicator	User ID	AIS Version Indicator	International Maritime Organization (IMO) Number	Call Sign	Name	Type of Ship and Cargo	Overall Dimension / Reference for Position	Type of Electronic Position Fixing Device	Estimated Time of Arrival (ETA)	Maximum Present Static Draught	Destination	Status of Data Terminal Equipment (DTE)	Spare

AIS Message 5 Field Descriptions

Parameter	Description
Message ID	Indicates that the following message is a "Message 5," given this, the listener knows the allocation of the next 418 bits because it is standard
Repeat indicator	Indicates how many times the message has been repeated by a base station (acting as a repeater station).
User ID	Originating vessel's Maritime Mobile Service Identity (MMSI) number; a unique number assigned to a vessel so that it can be identified unambiguously
AIS version indicator	Indicates the AIS version with which the station is compliant. 0 = complies with ITU-R M.1371-1; 1 = complies with ITU-R M.1371-3; 2-3 = complies with future revisions of ITU-R M.1371
IMO number	Number assigned to the vessel by the International Maritime Organization (IMO)
Call Sign	International Radio Call Sign (IRCS), a unique designator used for radio communications (it is 7 characters long)
Name	The transmitting vessel's common name (20 character maximum)
Type of ship and cargo type	A number corresponding to a distinct classification of ship and/or cargo
Overall Dimension / reference for position	Field is split into four numbers which, together, describe the ship length, width and antenna location
Type of electronic position fixing device	Indicates the method used to determine the vessels' position (e.g. GPS)
Estimated Time of Arrival (ETA)	Provides the month, day, hour and minute that the vessel is expected to arrive at its destination (input from the crew of the vessel)
Maximum present static draught	The depth of water required for the vessel to float with its present loading condition
Destination	The planned next port of arrival (20 character maximum)
Status of Data Terminal Equipment (DTE)	Indicates whether an external data terminal is connected and functioning or not
Spare	Always set to zero (reserved for future use)

Contact Us:

We welcome your input to help keep this newsletter both timely and valuable. Please send your comments or suggestions to the NAIS Project Office, by e-mail at NAIS@uscg.mil or call 202-475-3149. Also, please visit our website at www.uscg.mil/nais for more resources and information.