Maritime Domain Awareness –
Future Industry Solutions… FY10 and Beyond

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The Challenge

Conventional Warfare   **Global War on Terror**

Forward Presence

"We Need a NORAD for Maritime Forces"

Admiral Vern Clark, Former CNO
(August 15, 2002)

2/2005

NORTHROP GRUMMAN

The Problem

- *Over 150,000 commercial ships*
- *80,000 involved in global trade*
- *40,000 ships within 1,000 mi of US coastline*

VLCC
200091+ DWT

150W 120W 90W 60W 30W 30E 60E JE 120E

Enabling Technology Investment Areas

- ***Ability To <u>Uniquely</u> "Fingerprint" Thousands of Large and Small Hull Commercial Ships***

- ***Fusion and Reasoning Tools***

- ***Persistent Surveillance***

- ***Cooperative Communications / Information Sharing***

"Finger Printing"

- **AIS (Automatic Identification System)**
- **EO/IR**
- **Radar/Radar Emissions**
- **Acoustics**
- **Hyperspectral**
- **Other Unintended Emissions**

- **Less Uncertainty**
- **More Targets**
- **Greater Ranges**
- **Bearings and Tracks**

BULK CARGO CARRIER

25 nmi Range

GOES-12 IMAGER - 3.9 IR (CH 02) - 2015 UTC 10 FEB 2003 - CIMSS
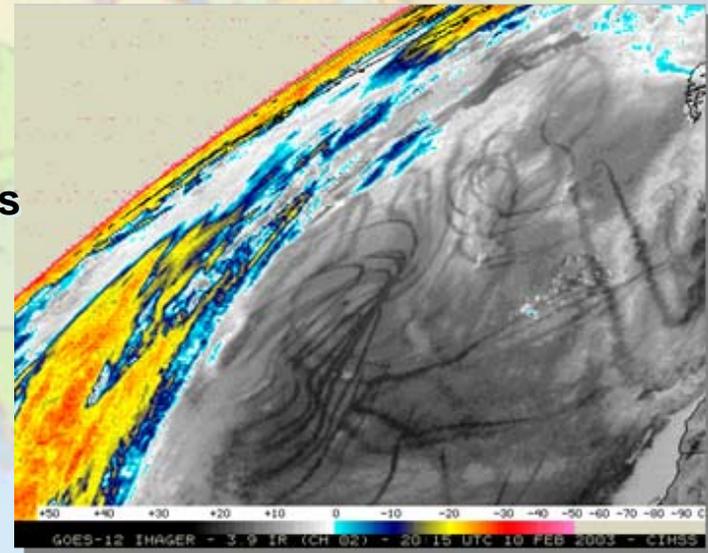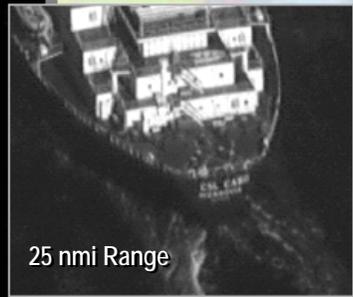
"Knowing Who's Who with Certainty"

Fusion and Reasoning Tools/Algorithms

- **Behavior Analysis / Pattern Recognition**
- **Netted and Shared Information**

NOA: Ship, Voyage, Cargo, Crew

NOA: INFO, Criminal Data Bases Other Intelligence

Track Files

Ship and Company Data Bases

AIS Info

Port Data Bases

- *"Clutter Rejection"… Weeding Out the Good Guys*
- *Knowing Where Your Ship Has Been Lately?*

Persistent Surveillance

Sensor /
Capability
vs.
Power

Solar Electric

Hybrid Electric

Autonomous
Refueling

- *Day* ➡ *Week* ➡ *Month* ➡ *Continuous*
- *Tracking the Exceptions*
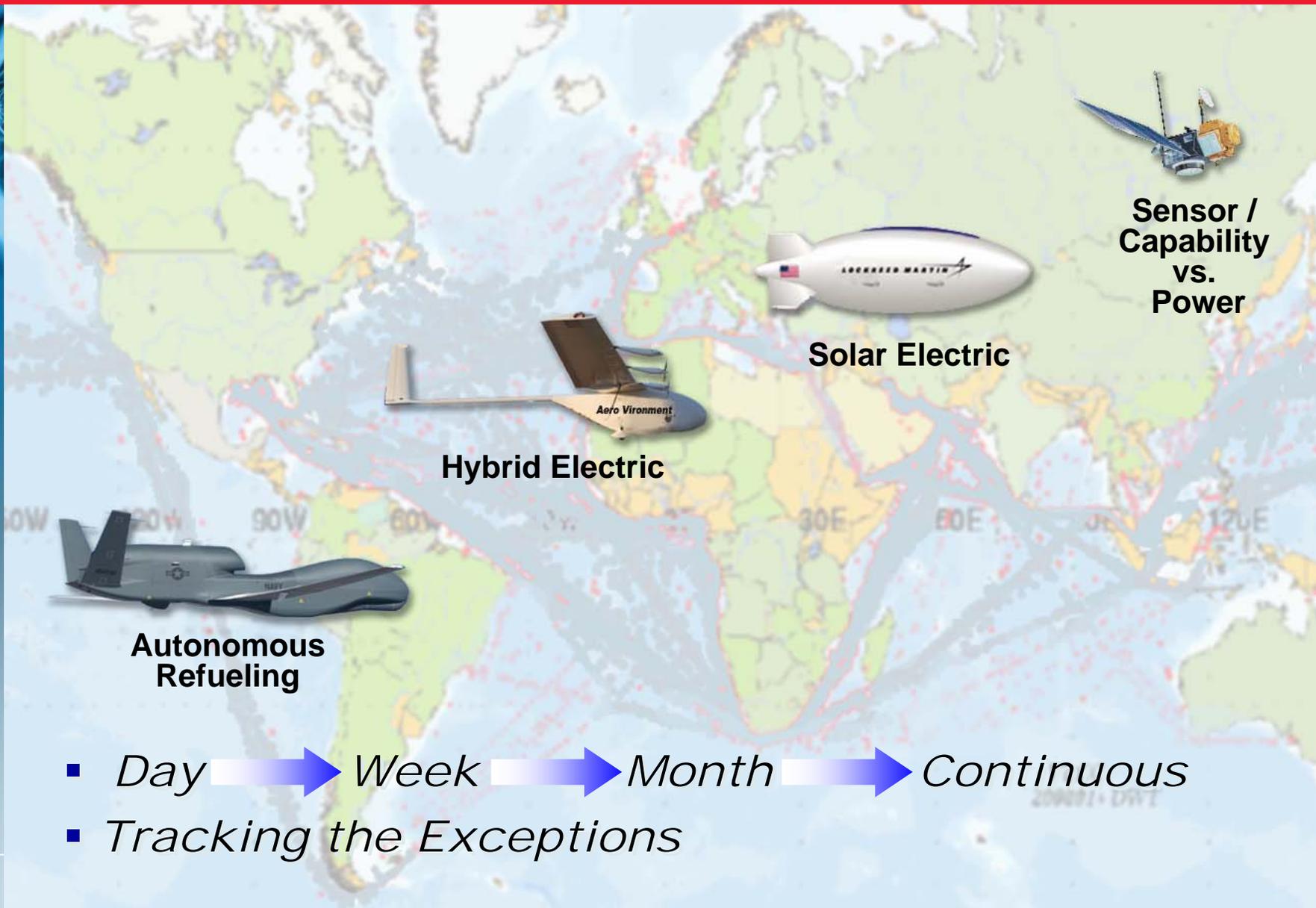
Cooperative Communications / Information Sharing

- **Linking dissimilar systems together cost effectively... Today today**
- **Assured Comms**

- *"Pay for it only when you need it"*
- *Seek options which provide interoperability / netcentricity now, and... enable affordable transition to standards / common systems*

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Duck Hunting Made Easy

NORTHROP GRUMMAN
DEFINING THE FUTURE