

# *United States Coast Guard Auxiliary Telecommunications Workshop*



Homeland  
Security

# United States Coast Guard

- The lead military agency of the Department of Homeland Security (not DOD)
- A multi-mission agency:
  - Law Enforcement
  - Safety of Navigation & SAR
  - Military Operations
  - Environmental Protection
- Extensive Sea-borne and Air-borne Assets

# COAST GUARD COMMS

- CG utilizes a full range of comms:
  - From Medium Frequency through UHF +:
  - 2 Megahertz through 800 Megahertz plus Satellite Comms
- CG utilizes a full range of modes:
  - Voice
  - Digital Data transmission
  - Images



# NATIONAL DISTRESS RESPONSE SYSTEM (NDRS)

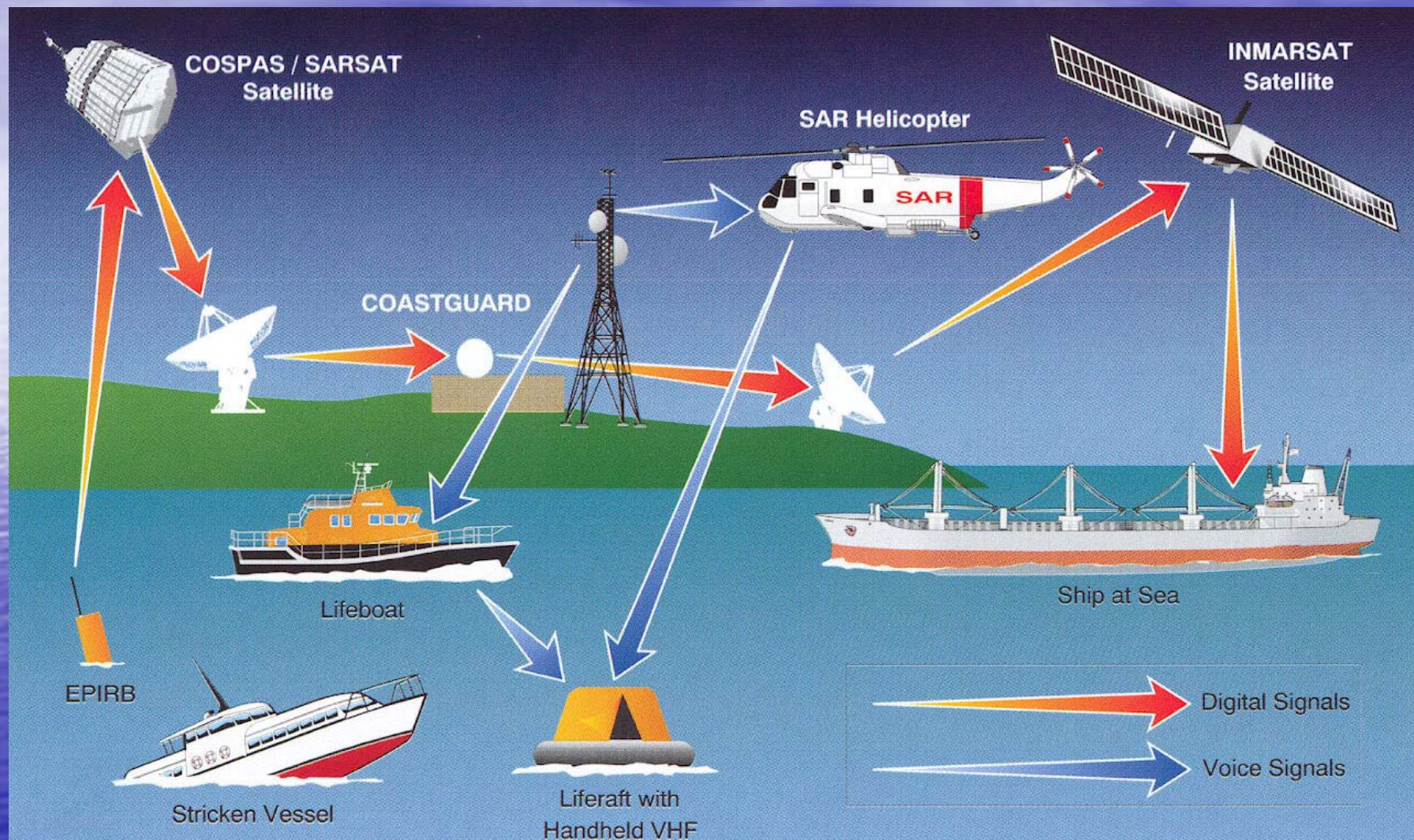


- Results of piecemeal growth.
  - Obsolete / aging equipment.
  - Lack of spare parts.
  - Non-standard equipment throughout system.
  - Limited to single channel, transmit or receive at a time.
  - Gaps & "Dead spots" in numerous coverage areas.
  - Virtually no DF capability.
  - Limited interoperability with other agencies.
  - No means for secure/protected communications.
  - No effective way to track assets.
  - Cannot comply with GMDSS obligations.

# GMDSS – the DRIVER

In 1999, a whole new concept in maritime communications was put into place called **Global Maritime Distress and Safety System**







# GMDSS Components

- GMDSS mandatory on commercial vessels
- GMDSS voluntary on recreational vessels
- COSPAS – Satellite based SAR services
- VHF Radio
- Digital Selective Calling
- Rescue 21 System
- Automatic Identification System
- Cell Phones

# VHF RADIO

- Most commonly used service in coastal areas and inland lakes. 20 miles
- Used by commercial and recreational vessels alike.
- Focused on Safety.
- CG monitors Channel 16 24/7.
- Other channels used for command and control.
- CGAUX uses 81A, 82A, 83A working channels



# Digital Selective Calling

- Digital selective calling (DSC), an alternate distress communication system used internationally on Channel 70. If properly registered with a Mobile Maritime Service Identity (MMSI) number and interfaced with GPS, the DSC radio signal transmits vital vessel information, position, and the nature of distress at the push of a button.

- DSC is part of GMDSS
- DSC uses digital data rather than voice to transfer information between radios
- Can direct information to specific addresses
- Effective range is improved
- DSC Radios must be registered in order to work
- Encoded with unique 9 digit FCC ID number or MMSI to each vessel or shore station
- Information on vessel entered in USCG national distress database



- System operates on HF and VHF with worldwide coverage
- Sends automatic MAYDAY on Channel 70 that identifies vessel
- Private ship to ship calls possible just like a cell phone call
- DSC can not only page a specific vessel but also automatically switch that vessel's voice radio to a specific channel
- DSC can page vessels in a particular area or in a pre-defined "Group"

# USCG RESCUE 21 SYSTEM

- Largest system upgrade in CG history, will bring CG marine communications into the 21 st century
- Contract awarded to General Dynamics Decision Systems (GDDS) in 2002
- Will cost \$714 million
- Incorporates DSC for VHF
- Adds AIS (Automatic Identification System)
- Eventually will allow data transmission
- Implementation is behind schedule due to software problems and high site acquisitions



## RESCUE 21 also provides for

- Uninterrupted Channel 16 guard
- 98% coverage of maritime zone, out to 20 NM
- Direction-Finding capability  $\pm 2^\circ$  5 watt 2 meters off the water.
- Automatic Asset Tracking & Public Safety Interoperability
- Archiving/ Recording of calls
- Digital Selective Calling on Ch. 70
- Improved Recoverability & Operational Availability requirement

- Marine-band radios provide boaters the most reliable maritime distress notification.
- Rescue 21 helps the USCG save lives by taking the 'search' out of search and rescue.
- Rescue 21 is flexible to new technology, like DSC radios, but boaters **must** register their MMSI and properly connect the DSC radio to their GPS.
- Single biggest change in CG Comms since the introduction of FM VHF radio



# PUGET SOUND VESSELL TRAFFIC CONTROL SYSTEM

# VTS Center 1974-1979





# VTS Center 1979-1996



# VTs Center 2006



Photo by Dave McKnew



# Sector Operators at VTS



Photo by Dave McKnew

USCG Auxillary Communications

19

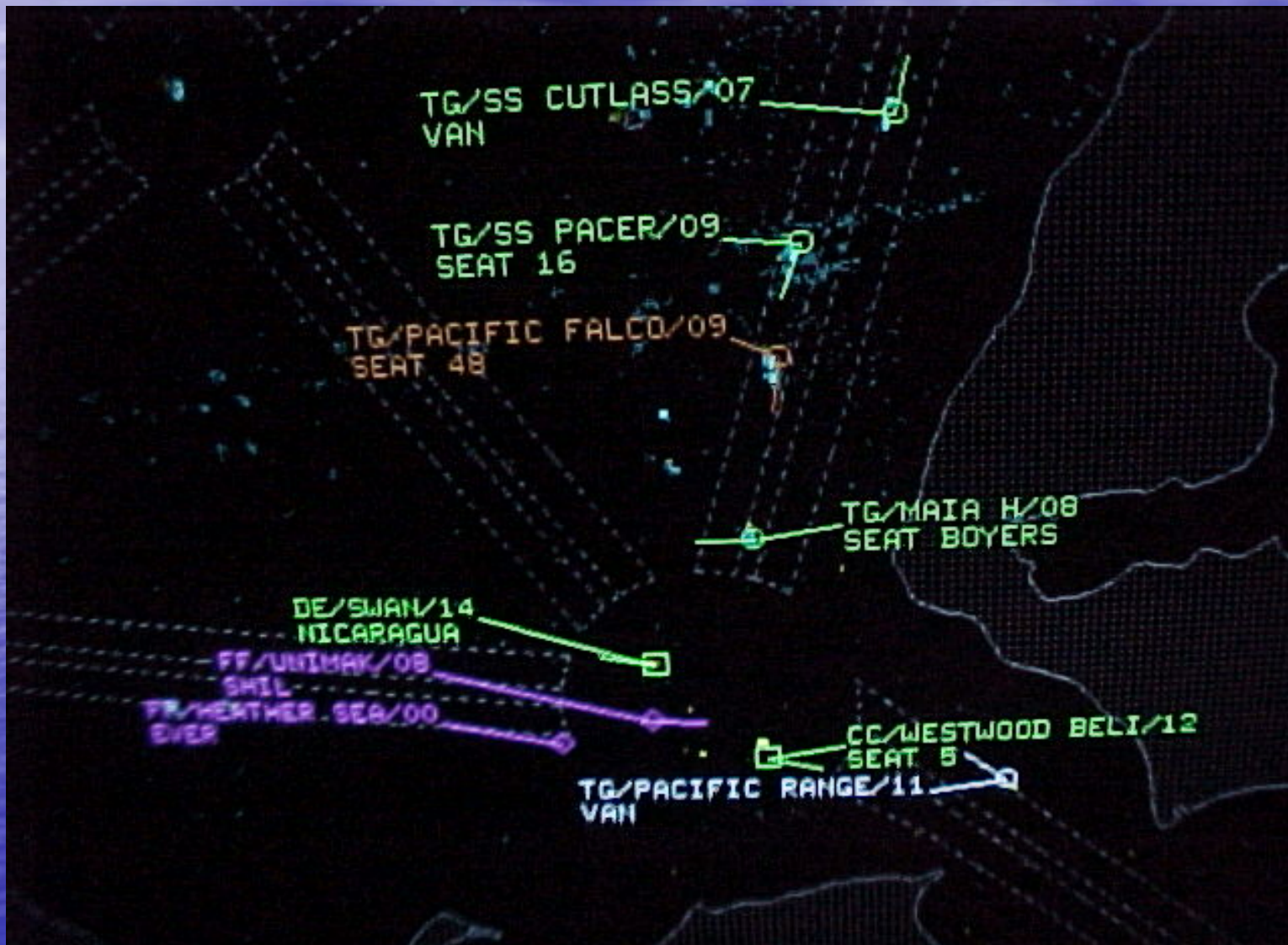
# Operator on Straits Sector



Photo by Dave McKnew



# What we see at VTS



# Assist tug on the go



Photo by Petty Officer Van Hise

USCG Auxiliary Communications

22



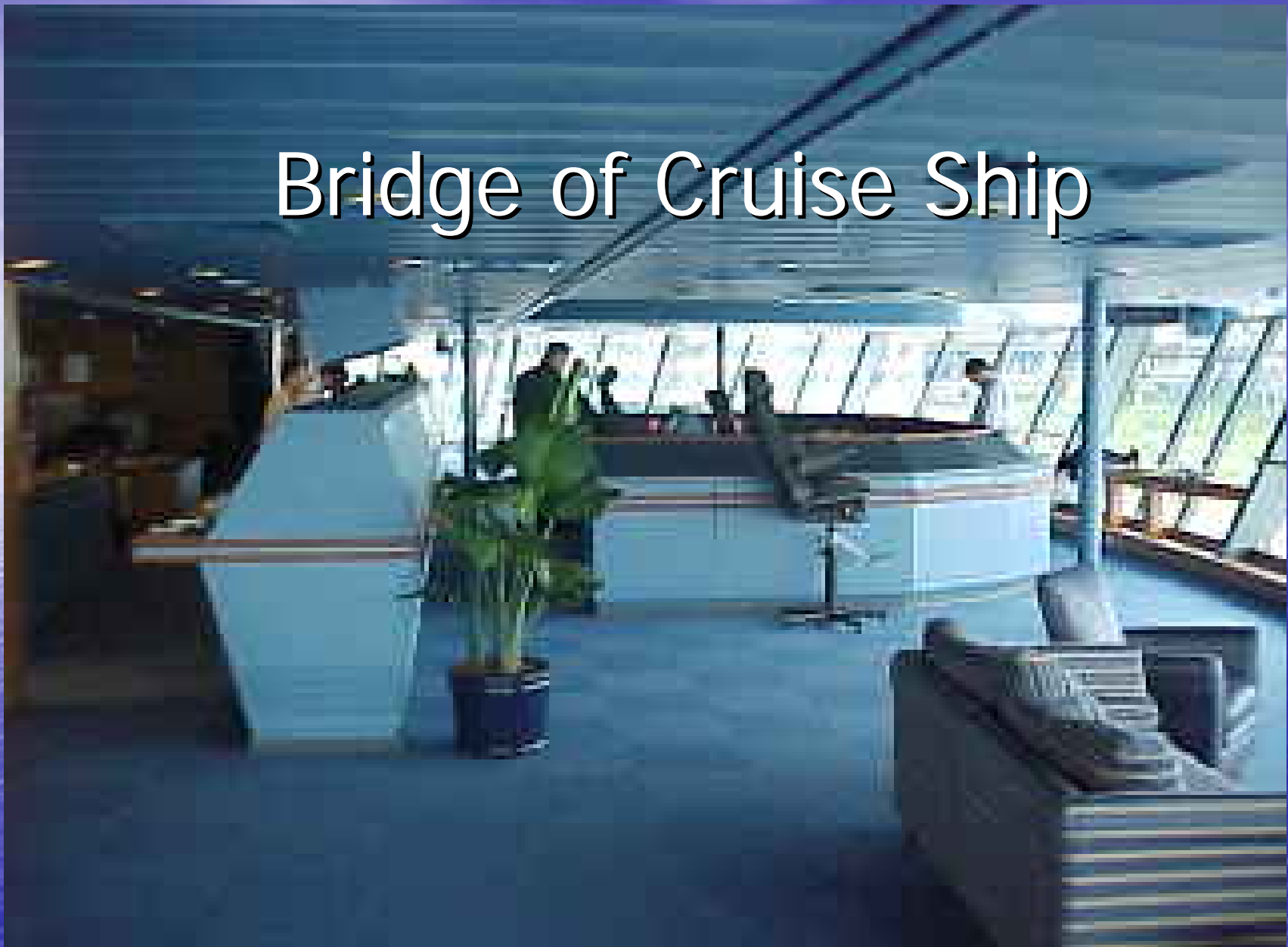
# Cruise ship in Seattle



Photo by Dave McKnew

USCG Auxiliary Communications

# Bridge of Cruise Ship



# Where not to be.....



USCG Auxillary Communications

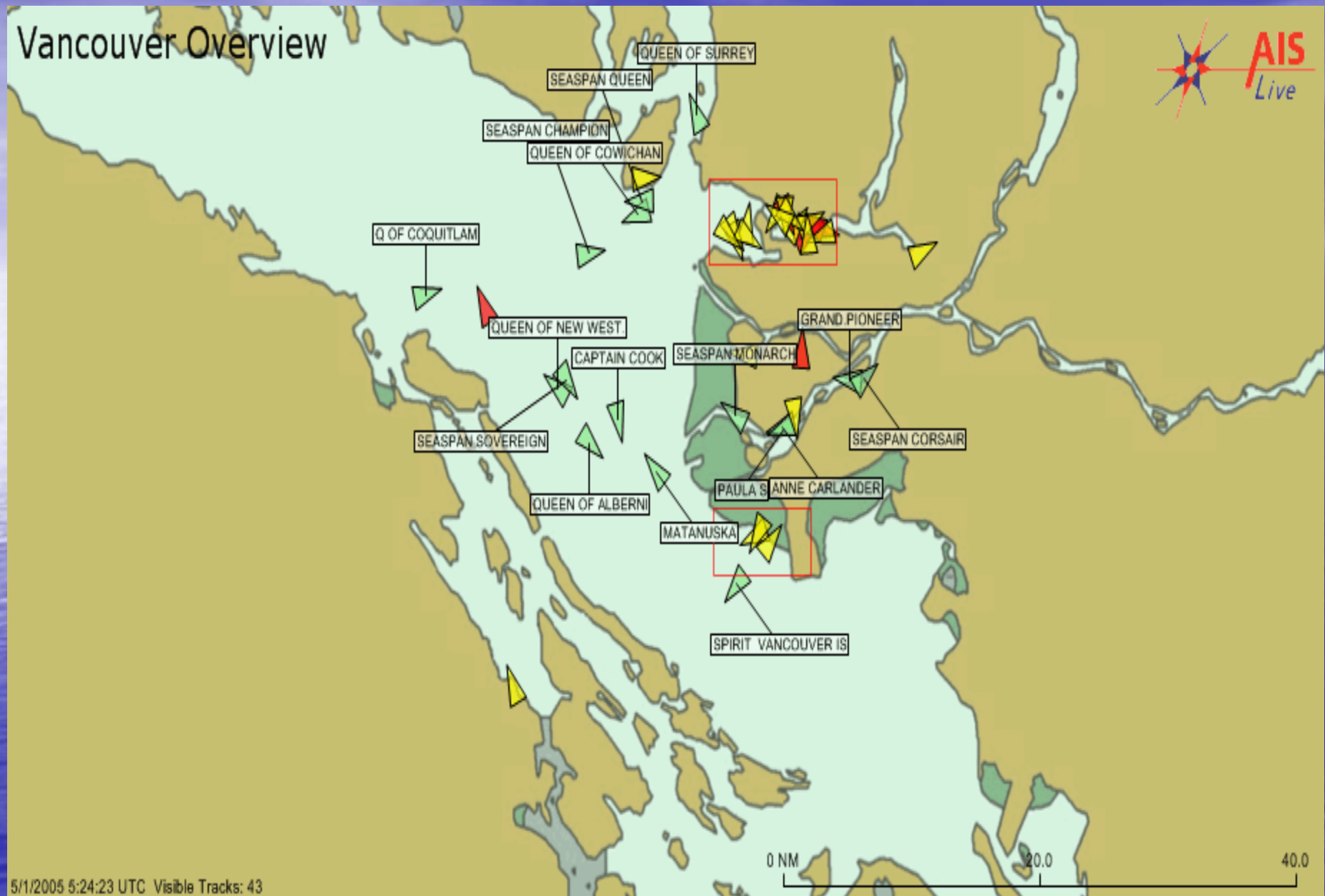
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# Automatic Identification System (AIS)

- AIS is a transponder based system using UHF radios.
- Vessels will automatically transmit a variety of information periodically
- Supplements coastal radar coverage (Vessel Traffic System) with detailed information
- Implemented now on large vessels

## Vancouver Overview



# Cellular Telephones on Boats

- CG does not advocate cell phones as a substitute for regular maritime distress and safety systems
- Cell phones cannot generally provide ship to ship safety communications or communications with rescue vessels
- Most cell phones are designed for land-based service and offshore coverage is limited
- Locating a cellular caller is hard to do



# Cell Phones - Continued

- VHF marine radios provide storm warnings and other urgent advisories
- Cell phone best as an on-board telephone as a link to shore based systems
- VHF marine radio is a powerful ally in an emergency

# Other Radio Options

**Ham Radio**      VHF/UHF/HF, Licensed Required

**CB Radio**      Low Power, No License, AM

**GMRS**      UHF, License Required

**FRS**      UHF, Very Low Power, CCTS

None of these systems are monitored by the Coast Guard





# **COAST GUARD AUXILLIARY COMMUNICATIONS**

# Primary purposes of the Auxiliary communications

- Coordinating authorized Auxiliary activities in support of Coast Guard Operation
- Augmenting the Coast Guard communications system, when required.
- Communicating urgent matters of official Auxiliary business.
- Training.
- Assisting national resources in time of disaster.



# CG AUXILIARY ROLES

- Public Education - "Use of your radio"
- Safety Patrols (Puget Sound and Lakes/Rivers)
- Vessel Inspection - Team communications
- Watchstanding – CG & CGAUX
- Search and Rescue
- Harbor Security Patrols
- Long Range HF Emergency Preparedness

# Base and Mobile Facilities





# *How can YOU Participate?*

- Join a local Flotilla
- Fill out paperwork for Security Clearance
- Complete ICS Training
- Attend Communications Training (AUXCOM)
- Acquire a Radio Facility



# IF YOU AIN'T GOT COMMUNICATIONS, YOU AIN'T GOT NUTTIN'



- **QUESTIONS**

