Capacity building for Maritime Domain Awareness in East Africa
Overview

• What is NAVAF and what do we do?
• What is our model for capacity building?
• Programs for capacity building
  ➢ Africa Partnership Station
  ➢ CUTLASS EXPRESS
• Maritime Domain Awareness
  ➢ NAVAF goals and achievements
  ➢ SeaVision, CAMTES and Sametime chat
  ➢ Space Based Maritime Domain Awareness Network (SAMNET)
UNCLASSIFIED

Maritime Security Operations

- **Operate Forward** with regional partners, government and non-governmental organizations to provide security at sea

- **Be Ready NOW**
  - Africa Partnership Station (APS)
  - "EXPRESS" series exercises
  - Africa Maritime Law Enforcement Program
  - International collaboration / partnerships

- **Shape the Future**
  - Strengthen capabilities of regional organizations
    - Increased African leadership
  - Integrate with international navies
    - EU, NATO, CTFs
  - Strengthen interagency coordination
The effective understanding of anything associated with the maritime domain that could impact the security, safety, economy, or environment of a nation.

Why is MDA Important?
- Fight piracy and illegal trafficking (fish, humans, weapons, drugs)
- Protect international trade – food and energy security, economic growth
- Employ forces economically, effectively

This mission unites us in an intergovernmental, interagency, military and civilian effort dedicated to achieving the maritime safety and security that is the foundation for economic growth and development.
**MDA Goals**

**Strategic Goal:** Support African partners to build MDA capacity to protect their territorial waters and EEZ from piracy and illegal activities.

**Operational Goals (since 2010):**
1. Build capacity - HW, SW, Maintenance
2. Improve Interagency cooperation
3. Increase ops center communication
4. Facilitate Data Sharing
5. Deploy Advanced capabilities
6. Foster Continuous Improvement

**Tactical Goals:**
1. Each country reporting into MSSIS
2. Partners trained in MDA tools
3. Maintain a Common Operating Picture
4. 24/7 watch on key areas of interest
5. Techniques to find non-identifying targets
6. Track and report high risk vessels
7. MDA data to stop piracy and trafficking
Goal 1: Build partner MDA capacity
Equipment: Maritime Surveillance System (MSS)

• Surveillance system consisting of radars, AIS, and data fusion display, some cameras
• Data fusion display provides radar with overlayed AIS data
• Connected to MSSIS
• Deployed in a number of East Africa countries though the Navies
## Goal 2/3: Interagency Cooperation, Cooperation between Operations Centers

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Countries</th>
<th>Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa Partnership Station Phased MDA Training</td>
<td>2013</td>
<td>Tanzania</td>
<td>Navy, MRCC</td>
</tr>
<tr>
<td>CUTLASS EXPRESS</td>
<td>Nov 2012</td>
<td>Djibouti, Kenya, Mauritius, Mozambique, Seychelles, Tanzania</td>
<td>Navies, MRCC (Tanzania) RMRCC (Kenya)</td>
</tr>
<tr>
<td>Environmental Workshop</td>
<td>Jun 12</td>
<td>Tanzania</td>
<td>Fisheries, Marine Parks, University of Dar es Salaam, Navy, Port Authority, Public Prosecution.</td>
</tr>
<tr>
<td>Space Based Advanced MDA Network</td>
<td>2012</td>
<td>Seychelles, Mauritius</td>
<td>Seychelles: Foreign Affairs, University of Seychelles, Police, Coast Guard, Ministry of Information, Fisheries. Mauritius: Coast Guard, Research Institute</td>
</tr>
<tr>
<td>Hydrography Workshop</td>
<td>2011</td>
<td>Tanzania</td>
<td>Navy, Port Authority</td>
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<td>Fisheries Enforcement Workshop</td>
<td>2011</td>
<td>Tanzania</td>
<td>Navy, Fisheries</td>
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<tr>
<td>Equipment networking agreement</td>
<td>2012</td>
<td>Tanzania</td>
<td>Navy, MRCC, International Maritime Organization</td>
</tr>
</tbody>
</table>
Goal 4: Create a robust maritime information sharing environment

SeaVision
- Current data streams
  - MSSIS real time AIS
  - Satellite AIS
- Future data
  - Satellite Radar
  - Coastal Radar
  - Electro optical satellite

- Vessels
  - Cargo vessels > 300T
  - Passenger ferries
  - Trawlers
  - Small vessels

- Tools
  - Threat detection: CAMTES
  - ICODE MDA – Ship detection, widgets
Goal 4: Robust maritime info sharing environment
Maritime Safety and Security Information System (MSSIS)

MSSIS

• Collects and distributes worldwide, open source AIS data
• Participants voluntarily share national AIS information. In return participants have access to all AIS in the network including SEA VISION
  • Participants upload/view AIS data on TV32 software (developed by Volpe)
  • Developed, hosted and maintained by US Department of Transportation Volpe Center
• Volpe provides operations and maintenance support for NAVAF servers
  • Seven country visits per year
  • Sever upgrades in FY13

http://en.wikipedia.org/wiki/Maritime_Safety_and_Security_Information_System
http://www.youtube.com/watch?v=AEuWV-1yV80
Goal 4: Robust maritime info sharing environment
Turning the lights on around Africa

- Jun 2009
- Jun 2010
- Jun 2011
- Oct 2012 – MSSIS only
- Oct 2012 – with Sat AIS

- Satellite AIS tracks now 70% of the COP
- Close to 5 million messages per day around Africa
- 19 countries regularly contributing to MSSIS and using SeaVision
- Ships starting to transpond off Somalia
- 8 satellites from 2 provides – maximum 2 hrs latency
- Coverage to 400 NM from coast
Goal 4: Robust maritime info sharing environment with and without satellite AIS

Satellite AIS
- Doubles the number of contacts
- Easy access (through web)
- Increases the range of data (400 NM+)
- Covers areas of coast not covered by Terrestrial AIS
- Doesn’t require equipment maintenance

MSSIS Picture
- Real time
- Receiver line of sight
- Maintenance has been improved through digis
- Internet connections required
- Links are a problem
Goal 4: Robust maritime info sharing environment

CUTLASS EXPRESS: Drawing tools
Goal 4: Robust maritime info sharing environment

CUTLASS EXPRESS: Satellite Radar drills
Goal 4: Robust maritime info sharing environment
Countries are contributing MSSIS data regularly

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<tr>
<th>Country</th>
<th>Jan '12</th>
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<th>Mar '12</th>
<th>Apr '12</th>
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Countries Participating
Click and drag in the plot area to zoom in.
Goal 4: Robust maritime info sharing environment
SeaVision usage is widespread by African partners
Goal 4: Robust maritime info sharing environment
CAMTES Threat Assessment Tool

Computer Aided Maritime Threat Assessment System (CAMTES)
**Goal 4: Robust maritime info sharing environment**

**CAMTES Threat Assessment Tool**

<table>
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<th>Port Movements</th>
<th>Yellow</th>
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<td>Trusted Conveyance</td>
<td>Green</td>
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<td>Trusted Crew</td>
<td>Green</td>
<td>0</td>
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<tr>
<td>Trusted Ownership</td>
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<tr>
<td>Vessel Registration</td>
<td>Red</td>
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**Vessel Safety**

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<tr>
<th>Details</th>
<th>Interest Factor</th>
<th>Score</th>
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<tbody>
<tr>
<td>Longest Detention</td>
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</table>

<table>
<thead>
<tr>
<th>Details</th>
<th>Rule</th>
<th>Score</th>
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<tbody>
<tr>
<td></td>
<td>Longest Detention Between 1 and 3 Days</td>
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<td></td>
<td>Longest Detention Between 11 and 15 Days</td>
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<td>Longest Detention Between 16 and 20 Days</td>
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<td>Longest Detention Between 4 and 10 Days</td>
<td>0</td>
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</tbody>
</table>

**Details**

- **Reason for Score:**
  - **Score:**
  - **Rule ID:** 06.42.5
  - **Rationale:**
    - This vessel's longest period of detention has been more than 20 days.
    - The longest detention for this vessel was greater than 20 days in length. Longer detentions are most likely the result of numerous safety and security violations indicating a vessel that practices unsafe seamanship.

**Result**

<table>
<thead>
<tr>
<th>VesselDetail.MaxDetainedDays IS GREATER THAN 20</th>
<th>Result</th>
<th>Score</th>
</tr>
</thead>
</table>
**Goal 5: Harness advanced capabilities**
*Space Based Advanced MDA Network (SAMNET)*

**Goals**

- **Improve SeaVision and NAVAFCOP with additional tools and data.**

- **Work toward regional MDA operations centers and information sharing.**
  - Regional partners become leaders, building capacity and information sharing locally.
  - Focus on inter-agency partnerships between both civilian (Fisheries, Ports and Harbors) and military (Navy, Coast Guard, Air Force) agencies to improve information exchange and efficiency locally.

- **Build MDA capacity in partner nations, strengthen cooperation**
  - Improve partner MOCs and ensure sustainable partner contribution to MDA.
  - Address challenging MDA problems through local capacity/solutions (i.e. small vessel detection via corner reflectors, fishing fleet tracking).

- **Enable coordinated joint patrols and exercises (SADC)**
  - Effective communication, information exchange, joint planning and execution.
Goal 5: Harness advanced capabilities
SAMNET-Southern Indian Ocean

- Project started in FY12 with Mauritius and Seychelles (Coast Guards, Fisheries, Universities, Research Labs) to share data regionally and develop additional data analysis tools
  - Plan to share RADAR and VMS between regional partners.
  - Developing home-grown solutions to address relevant MDA issues (small boats, piracy, IUU fishing)
    - Integrating visualization of all data (currently RADAR, AIS, and VMS are on separate displays).
    - Perform series of sea trials, evaluate contribution and gaps from each available data source.
**Goal 5: Harness advanced capabilities**

**SAMNET-Southern Indian Ocean**

- Planned and executed sea trial with Seychellois to evaluate detectability of RADAR reflectors with Coastal RADAR.
- Seychellois contributed significant time and resources to sea trials.
Goal 5: Harness advanced capabilities
SAMNET-Southern Indian Ocean

- Since site visits and DIGI installs were performed at 5 AIS sites in Mauritius and Seychelles in June, 2012 contributions to MSSIS have significantly increased.

▼ Mauritius and Seychelles Patrol crews are now using SeaVision to plan and execute patrols.

<table>
<thead>
<tr>
<th>Average Contribution</th>
<th>Prior to June 2012</th>
<th>After June 2012</th>
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<tbody>
<tr>
<td>Mauritius</td>
<td>38.78%</td>
<td>96.15%</td>
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</tbody>
</table>
**Goal 5:** Harness advanced capabilities

**MDA Future Directions**

- **Long Term Goals**
  - Expand and include additional partners to build regional MDA.
    - SADC data sharing
  - Expand information sharing to include other sources of data beyond AIS.
    - Coastal RADAR data
    - VMS data
    - Vessel pictures, reports, analysis
  - Continue to integrate MDA tools and capabilities into SeaVision through ICODE-MDA.
Goal 6: **Support continuous improvement**

<table>
<thead>
<tr>
<th>2012</th>
<th>2013</th>
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<tbody>
<tr>
<td>➢ Developed and implemented a capability maturity model</td>
<td>➢ Support partner nations that would like to improve their national and military MDA capability.</td>
</tr>
</tbody>
</table>

**Key processes**
- National policy
- Organization/ Infrastructure
- Training/ Personnel

**5 levels:**
- Initial (ad hoc)
- Repeatable
- Defined
- Managed
- Optimized
<table>
<thead>
<tr>
<th>Level</th>
<th>Policy</th>
<th>Org/ Infrastructure</th>
<th>Training/ Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Interagency Cooperation</strong>&lt;br&gt;<strong>Regional Cooperation</strong>&lt;br&gt;<strong>National Planning</strong></td>
<td><strong>Equipment</strong>&lt;br&gt;<strong>Processes</strong>&lt;br&gt;<strong>Maintenance</strong></td>
<td><strong>Training programs</strong>&lt;br&gt;<strong>Career specialty</strong>&lt;br&gt;<strong>Skills and Morale</strong></td>
</tr>
<tr>
<td><strong>Level 5</strong></td>
<td>Proactive regional lead for sharing information.&lt;br&gt;Assists neighbors and improves joint patrols and prosecution agreements.</td>
<td>Operates one or more interagency fusion centers.&lt;br&gt;Operate as a regional ops center.</td>
<td>Training leader in the region.&lt;br&gt;Develops policies and procedures.&lt;br&gt;Shares lessons learned. Develops profiles of ‘normal’ and sees deviations.</td>
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<td><strong>Optimized</strong></td>
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<td><strong>Level 4</strong></td>
<td>Participates in regional MDA networks. Joint patrols. Exercises and updates national MDA plan.</td>
<td>Ops center has short term development and long term maintenance plans in place.&lt;br&gt;Continuous 24/7 watch.</td>
<td>MDA capabilities consistently employed and show results. Can compare radar and AIS pictures to see dark targets.</td>
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<tr>
<td><strong>Managed</strong></td>
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<td><strong>Level 3</strong></td>
<td>Regular meetings of maritime agencies.&lt;br&gt;Cooperation with neighboring countries on maritime security.&lt;br&gt;National MDA plan in place</td>
<td>Contributes to MSSIS &gt;80% of the time.&lt;br&gt;24/7 watches during ops or exercises&lt;br&gt;Maintenance contract in place.</td>
<td>Conducts initial training according to MDA training plan.&lt;br&gt;Career specialty for sailors.&lt;br&gt;Officers can earn BWC certification.&lt;br&gt;High morale.</td>
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<td><strong>Defined</strong></td>
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<td><strong>Level 2</strong></td>
<td>Some agencies work together for specific goals eg IUU.&lt;br&gt;Some regional discussions on maritime borders.&lt;br&gt;National MDA being considered</td>
<td>Ops center has working radar, AIS, MSSIS, and radio.&lt;br&gt;Regular internet and back up generator.&lt;br&gt;Ops center manned 12/5</td>
<td>MDA training plan in place.&lt;br&gt;Sends trainers to TTT programs.&lt;br&gt;Certification for watch keeping.&lt;br&gt;Ops center team led by a skilled JO or NCO 12/5.</td>
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<td><strong>Repeatable</strong></td>
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<td><strong>Level 1</strong></td>
<td>Minimal interaction between maritime stakeholders.&lt;br&gt;Low levels of trust and transparency.&lt;br&gt;No national MDA plan.</td>
<td>MDA systems fail and are slow to be repaired.&lt;br&gt;Ops center manning is inconsistent.&lt;br&gt;Internet and power patchy.</td>
<td>Mixed level of skills.&lt;br&gt;Low operational tempo.&lt;br&gt;No link to civilian watch centers.&lt;br&gt;No MDA training plan.</td>
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<td><strong>Initial</strong></td>
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Summary: US Naval Forces Africa (NAVAF)

Capacity Building in MDA

• NAVAF
  ➢ Key Engagement Programs
    ✓ Africa Partnership Station
    ✓ CUTLASS EXPRESS Exercise
  ➢ Our MDA Strategy for Africa has 6 goals
    ✓ Equipment and maintenance capacity
    ✓ Interagency cooperation
    ✓ Improved communications between operations centers
    ✓ Robust data sharing
    ✓ Advanced capabilities
    ✓ Continuous improvement/ process maturity
  ➢ MDA Engagement and data sharing
    ✓ Space Based Advanced MDA Network (SAMNET)
    ✓ MSSIS – VOLPE (US Department of Transportation)
Questions?

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Kirsty.mclean@eu.navy.mil