DHS Science & Technology Directorate
Project NEMO
The hunt for Self-Propelled Semi-Submersible (SPSS) boats & other small vessels

Brief to:

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from Science and Technology… to Security and Trust

Homeland Security

The Problem

Capability Gap: The current capability gap is the inability to detect, persistently track, and evaluate non-cooperative, non-emitting vessels (particularly small boats less than 100 feet) in ocean areas extending past the port region, beyond-the-horizon.

*Background: Self-Propelled Semi-Submersibles (SPSS) represent the emerging sophistication and innovation of drug traffickers to adapt to U.S. and regional counter drug capabilities.
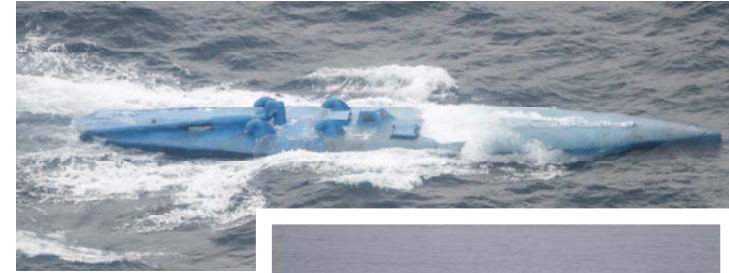
• Vessels are designed and built by Drug Trafficking Organizations (DTO) in Colombia to smuggle large volumes of cocaine over long distances in a manner that is difficult to detect

• *U.S. counterdrug officials estimate that SPSS are responsible for 32% of all cocaine movement in the transit zone*

• Since the vessels have a low profile – the hulls only rise about a foot above the waterline -- they are hard to see from a distance, leave little wake and produce a small radar signature

• U.S. Southern Command, the U.S. Coast Guard and regional officials consider SPSS a serious threat to U.S. and regional security

Source is USSOUTHCOM

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The Problem

Why SPSS's?: *The growing number of SPSS vessels indicates that their stealthy characteristics and ability to carry many tons of cocaine have helped them develop into what now seems to be a major component of the narcotics logistics chain

• * Colombian Navy believes that during the past two to three years, cocaine smuggling SPSS vessels have been arranged mostly by the drug trafficking factions of the FARC, probably in association with organized crime groups also involved in drug trafficking

• **Profit margin:

  – 1 Kg of cocaine is sold in the US for ~$20 to $25,000 USD ($30 to $35,000 USD in Europe)

  – 7000 Kg of cocaine can be carried in a SPSS

  – *Money earned: 7000 x 25,000 = $175 million USD*

  – Captain gets paid $20 to $25,000 USD per trip, other crew gets $5 to $6,000 USD per trip; Total crew cost ~$40,000 USD

  – *$1 to $2 million invested to build and run a SPSS is ~2 to 3% of the whole profit made → it's good business!*

*Source: * 2008 Jane's Information Group, **MarineBuzz.com*

Seized contraband ⟶

The Challenge

***Target Characteristics:** SPSS has proved to be very reliable for smuggling since 1990s, boats are becoming larger and more sophisticated

• 40 to 80 feet in length, very low freeboard (typically 18" or less)

• Typically fiberglass/wood construction

• Propelled by single or twin diesel engines

• Speed between 6-10 knots and range ~2000 NM

• Can carry up to four persons and cargo of 4-12 metric tons

• Crew operated or remote controlled, uses GPS for navigation

• Takes several months to build at a cost of ~$ 2 million USD

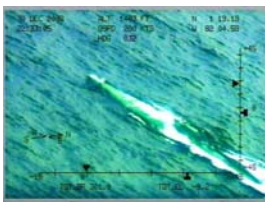*Source is JIATF-S

Bigfoot-1 on static display at JIATF-S, Captured Nov 2006

Bigfoot-2 Captured Sep 2008

SPSS vessel tracked by CBP P-3 aircraft, 30 Dec 2008

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The Challenge

The Challenge at Sea:

• Very low observable target - vessel size and material composition complicate detection

• Extremely large search area to cover – known operational area in the eastern Pacific covers more than 1 million SQNM

• Background environment makes the problem harder
  – Other small, legitimate boats operate in the target area
  – Weather conditions can obscure the target vessel
  – Resource limitations

1M SQNM

Examples of target and background vessels

Self-Propelled Semi-Submersible

"Go-Fast" Boat

Sport fishing Boat

Ribbed Boat

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Engagement Strategy

Capability Developers and Intelligence Providers

Primary Customers

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Intelligence Community

Science and Technology

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Need "formal" Inter-Agency Advisory Group

- Coordinate RDT&E efforts
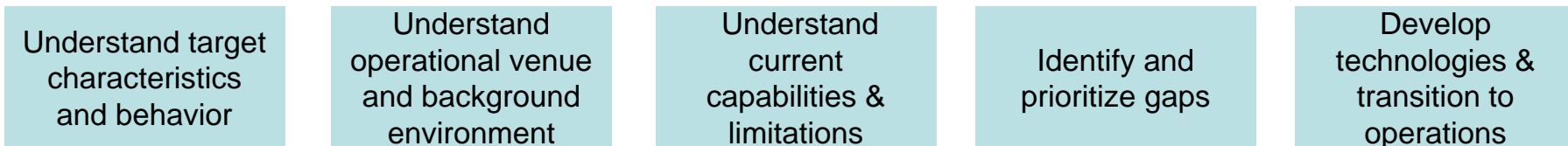- Develop holistic solutions
- Develop "National" capabilities

CBP – Air & Marine

The Approach

Interdiction Operations

Surveillance & Reconnaissance

Intelligence Analysis & Watch Operations

Movement & Interdiction

Enhance capabilities for each phase of the interdiction chain

Intelligence → **Technologies and Capabilities**

Understand target characteristics and behavior	Understand operational venue and background environment	Understand current capabilities & limitations	Identify and prioritize gaps	Develop technologies & transition to operations
What to look for, when to look & where to look	What can cause the target to be masked, hidden, or obscured from view	What resources do we have to detect, ID, and interdict the target	What's preventing us from accomplishing our mission	Fix it

Course of Action

Course of Action – How we are accomplishing our task

FY09 Activities ← → **FY10 Activities & Investments**

✓ **Completed a series of complex field exercises**

Collected a wide spectrum of data from multiple platforms

- Scenario driven
- Realistic targets
- Realistic operating conditions

Pluto – DHS constructed vessel

Bigfoot 2 – Captured vessel

Go-Fast vessel

Examples of other small vessels

Target Data and Environmental Factors ("Gold Standard")

NEMO dataset is being provided to RDT&E and Intelligence Communities

- **Evaluate test results**
- **Identify technology gaps**

Complete- Aug 09

Vessels are in DHS/S&T custody

CONOP and Employment Strategies

Architectures

Exploitation Algorithms

Analyst Tools

Future Testing

Acquisition Recommendations

Policy Recommendations

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Questions?

Backup

Close-up of Bigfoot-2

USS McInerney (FFG 8) and U.S. Coast Guard Law Enforcement Detachment 404 (LEDET) intercepted "Bigfoot-2", a Self-Propelled Semi-Submersible (SPSS) carrying seven tons of cocaine on 13 Sep 2008

Bigfoot-2 in tow behind USS McInerney

Bigfoot-2 as seen at the time of capture

Seized contraband

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The United States of America

Close-up of Pluto

Pluto is a DHS constructed craft the emulates many features of the known SPSS vessels

• Safer to operate – designed to be "unsinkable"

• Adaptable – can be used for many different testing purposes

• Available to other US Govt entities for testing

Pluto preparing for testing

Pluto

Pluto underway during testing

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