

# A Maritime Threat Assessment of Sea Based Criminal Organizations and Terrorist Operations

Terrance G. Lichtenwald, Mara H. Steinhour, and Frank S. Perri

## ABSTRACT

*This article reviews the United States Department of Defense, law enforcement, and intelligence agencies' use of the Maritime Strategic Doctrine and the Drug Trafficking Vessel Interdiction Act to combat drug smuggling vessels and boats during counter-drug smuggling operations. Threat analysis, using strategic warning indicators, is proposed and employed to analyze a range of factors: coalitions between drug trafficking and terrorist organizations, self-propelled semi-submersible vessels, low-profile vessels, robotically controlled and human-piloted submarines, and recruitment of captains and crews with the ability to pilot these vessels and boats. Drug trafficking organizations and terrorist groups' inter-technology transfer of sea-based smuggling and terror tactics are analyzed. Circumstances under which strategic warning indicators may necessitate policy changes to the Maritime Strategic Doctrine are described.*

## INTRODUCTION

*Tell me what you know. Tell me what you don't know. Tell me what you think. Always distinguish which is which.*

**General Colin L. Powell, USA, CJCS,  
1990**

Within the past year, two different drug trafficking submarine construction projects were discovered: one in Ecuador near a tributary close to the Colombian border and the second in Timbiqui, Colombia. The discovery of submarine construction sites again raised the issue of threats posed by South American drug trafficking organizations (DTO) and terrorist group coalitions. Upper level US policymakers are concerned about terrorist groups' substantial control over construction sites for low profile

vessels (LPV), self-propelled semi-submersibles (SPSS), and submarines in South America. US Representative Ted Poe, R-Texas, announced during a speech in the House in May 2011:

Just to be clear, Mr. Speaker, intelligence tells us that these submarines are made by the Revolutionary Armed Forces of Colombia, or FARC. That is the military wing of the Colombian Communist Party. Of course, that is how they finance their revolution and the revolutionary ideas in South America.<sup>1</sup>

There are reports that the FARC has substantial control over the construction process, in large part due to the FARC controlling the drug labs in the jungles and the exit routes for drug trafficking.<sup>2</sup>

FARC terrorist groups, their connection with DTO, and control of construction sites raise concerns that Middle Eastern terrorist groups, which have metastasized from western Asia to South America, will gain access to SPSS and LPV and use them in terrorist attacks.<sup>3</sup> These groups include Hezbollah and Hamas, as well as Shining Path Maoist-style narco-terrorists of Peru. Submarine discoveries in Colombia and Ecuador raised questions of how to assess the probability that DTO or terrorist groups employing LPV, SPSS, or submarines might attack the United States, what form the attacks would take, and whether there is a method by which the United States could verify that an attack is imminent.

The 1960s intelligence mission of the National Indications Center provided strategic warning of possible attack to the United States from the Sino-Soviet Bloc. The center's threat assessment model, developed in 1963, shows promise when adapted for today's threat of sea-based drug smuggling. To achieve its mission, the center developed a basic inferential structure, referred to as an indicator list, which defined 123 types of specific behaviors that a Sino-Soviet Bloc

country might take if it intended to wage war against the United States. The specific occurrence of one of these behaviors was called an indication. "Indicators were used to develop strategic warnings, which differ from tactical warnings in timeliness and in derivation."<sup>4</sup> Tactical warnings rely exclusively upon mechanical detection devices, such as sonar nets which cannot trigger warnings until the attack has been set in motion, thus providing no more than a few hours and probably much less for US forces to react. Conversely, strategic warnings given before a strike is launched are derived from estimating enemy intentions as well as specific behaviors. While the warnings are to some extent dependent upon signals from mechanical detection devices, they also involve the analysis of a great deal of other data less easily quantified and correlated.

The Ramsey and Borner model is based on a research study that quantified and ranked the relevance of different types of indicator patterns of different types of hostile action indicating a premeditated surprise attack on the United States by the Soviet Union. In this article, probable strategic warning indicators based on analysis of observed behaviors of DTO and terrorist group coalitions are examined using a modified Ramsey and Borner model. The Colombian Norte del Valle drug cartel and the FARC are compared against the Liberation Tigers of Tamil Eelam (LTTE), a Sri Lankan rebel/terrorist group and the only terrorist group to have its own navy, including submarines. Terrorist sea-based attacks, such as the Mumbai attack of 2008 during which terrorist kill teams were inserted in country by way of open water craft; North Korea's attacks on South Korea, employing submarine warfare; the 2005 Abdullah Azzam Brigades rocket attack on US amphibious assault ships; and the al-Qaeda attacks in January and October of 2000 employing open water craft are compared and contrasted using the modified Ramsey and Borner model.<sup>5</sup>

Observable behaviors of DTO and terrorist groups in South America indicate that smuggling and terrorist group coalitions' intentions and capabilities to construct LPV that operate at the surface, SPSS capable of dropping several feet below the surface, and submarines that operate at depths as shallow

as sixty-five feet will exist as long as they are financially viable.

Prior to the demise of the LTTE in 2009, the group developed a smuggling warfare navy called the Kadal Puli, or Sea Tigers, which consisted of a variety of vessel classifications: suicide bomber, LPV, and SPSS for penetrating the Sri Lanka Navy blockade, as well as patrol boats, gunboats, and submarines. The Sea Tigers constructed some of these craft in their own boatyards. The Sea Tigers also had a flotilla of commercial vessels including, but not limited to, cargo and fishing vessels. Their initial missions were smuggling supplies (military supplies, weapons, etc.) through the narrow straits between India and Sri Lanka, as well as piracy, robbery, and finally drug smuggling, the profits from which supported the antigovernment cause.<sup>6</sup> Additional missions included attacking and sinking Sri Lankan Navy vessels and supporting the Black Tigers – the ground troops of the LTTE.<sup>7</sup> The Sea Tigers are of interest as a touchstone for a three-way comparison among DTO with no terrorist intent, narcoterrorists, and terrorist groups that also engage in narcotic smuggling for profit.

There may be a concern that DTO and terrorist groups may not cooperate because they have different motives. However an analogy can be drawn to land-based relationships that exist between organized crime and terrorist groups.<sup>8</sup> The authors suggest caution in making assumptions concerning interactions in reference to sea-based interactions. For example, the problems of organized crime and terrorism were often considered separate phenomena prior to 9/11. Security studies, the military, and law enforcement seminars discussed the emerging threat of transnational organized crime or terrorism, but the important links between the two were rarely made. This lack of linkage may be due in part to the fact that organized crime and terrorism are usually viewed as two different forms of crime. Organized crime's main focus is economic profit, while terrorism is often viewed as motivated by ideological aims and a desire for political change.

The 1990s can be described as the decade in which the crime-terror nexus was consolidated and the two separate

organizations identifiable by their distinct motives began to reveal operational and organizational similarities. In fact, organized crime and terrorism appear to be learning from one another and adapting to each other's successes and failures.<sup>9</sup> Since September 11, 2001 nations acknowledge the interrelationship between these organizations, especially since terrorist groups now use the services of organized crime to assist their activities and terrorists themselves engage in organized crime activities as a means of financial support. Furthermore, terrorist groups adopt methods to finance their operations that were once believed to be within the province of organized crime.<sup>10</sup> Just as land-based terrorist groups have blurred motives and tactics that may resemble those of organized crime groups that operate on land, it is not unreasonable to extrapolate the same analysis to the issues presented herein.<sup>11</sup>

South American DTO's inclusion of submarines in their smuggling navies, with the capability to cruise into US territorial waters, raises the question of what the similarities and differences are between the vessels in the DTO navies and the terrorist navies. Moreover, can the similarities and differences between the drug trafficking and terrorist navies be reliably identified? To what extent do the similarities and differences indicate shifts in strategic thinking and provide indicators of different types of threats to United States?

## WHAT WE KNOW

South American DTO constructed LPV that cruise between western and northern parts of South America into eastern and western parts of Central America. LPV have been identified setting to sea from the west coast of Colombia (Buenaventura). These vessels cruise the Pacific Ocean and rendezvous off the southwest coast of Mexico with smugglers who transport the drugs inland. A second set of LPV go to sea from the north coast of Colombia and cruise through the Caribbean Sea and rendezvous off the southeast coast of Mexico. Advantages of launching smuggling operations in the Pacific are the calmer waters and a coast that is not as closely

monitored or densely populated as the Caribbean shoreline. However, the Caribbean shoreline offers access to hideaways in the islands and direct routes to Central America and Europe.<sup>12</sup> LPV smugglers have further increased the probability of getting through sea-based security by employing navigation and communication equipment, stealth technology, and avoidance tactics.

A common land-based smuggling technique is to simultaneously send multiple smuggling vehicles using a variety of smuggling methods to cross territory, including official entry points. Sea-based smugglers mirror that strategy by employing multiple LPV or SPSS simultaneously to cross a country's territorial waters. The United States' sea based national security policy addressing the threat posed by sea-based smugglers was explained in detail in *A Cooperative Strategy for 21st Century Seapower*, presented by the chief of naval operations and the commandants of the US Marine Corps and US Coast Guard at the International Seapower Symposium in Newport, R.I. on Oct 17, 2007. The strategy draws the Navy, Marine Corps and Coast Guard even closer together in working to protect and sustain the American way of life and is referred to in this paper as the Maritime Strategic Doctrine.<sup>13</sup>

What is different about sea-based smuggling strategy – from a national security threat assessment perspective – is that these smuggling craft are coordinated to penetrate territorial sea boundaries on both coasts of Central America, a strategy analogous to coordinated penetration of Pacific and Atlantic coastal territorial waters of the United States simultaneously. To date, coordinated simultaneous penetration of a country from two different directions of its land or coastal borders has not been observed except during a time of war. Three factors inherent in South American DTO using LPV and SPSS necessitate a review of sources and methods used to evaluate threats they may pose to US national security:

- Inherent similarities between (a) underwater penetration of territorial waters and behaviors identical to a state-sponsored prelude to war and (b) terrorist groups using similar methods.

- The possibility that terrorist groups use drug terrorist coalitions to gain sources and methods that can be modified for terrorist attacks then pass this information to another terrorist organization (i.e., LTTE sharing sea-based methods, including suicide sea bombing techniques, with al-Qaeda).
- The conditions that enable terrorist groups to gain control of an LPV, SPSS, or submarine capable of penetrating US or allied territorial waters. An example of this is where a terrorist group, which has onsite access and operational knowledge, uses an LTTE Sea Tigers terrorist method and gains access to an LPV, SPSS, smuggling torpedo, or submarine via hijacking (while at sea) or sea robbed (while in the “harbor”) of the craft from the DTO.<sup>14</sup>

## IDENTIFYING DRUG TERRORIST BEHAVIORAL INDICATORS

During the Cold War, intelligence agencies that monitored and analyzed threat potentials had a general sense of how many Sino-Soviet Bloc sea vessels (including submarines) were produced each year, dry-docked for repairs, and operated at sea. Conversely, US agencies do not know the number of smuggling LPV and SPSS, or the possible existence of submarines, in the Pacific and Caribbean on a mission at any one time. Also unknown are the numbers of LPV and SPSS under construction, produced, and ready to be outfitted. The calculations regarding the possible size of the smuggling fleet is derived from captured vessels. For example, during the past three years, Colombia has succeed in intercepting sixteen SPSS and LPV in the Pacific on courses toward Central America.<sup>15</sup> During 2007, thirteen of the LPV were seized on Colombian dry land or stopped at sea. In the first six months of 2008, the US Coast Guard and the US Navy detected forty-two LPV or SPSS.<sup>16</sup>

The general behaviors of LPV and SPSS at sea are known. A small but notable number of LPV and SPSS set to sea from Ecuador, travel around the Galapagos Islands and then, bearing on a northeast course, head to the coast of Central America. Another set,

which constitutes the majority of the vessels, leaves South America and cruises to the east of the Galapagos, bearing north to Central America. A third smuggling fleet leaves northern Colombia, cruises north along the South American coastline, and arrives in Honduras, Guatemala, and Belize. A fourth fleet leaves northern Colombia and cruises to Haiti, Jamaica, or around the southeast of Cuba and north to the Florida Keys. Thus, if an applied behavioral analysis indicates that DTO have fallen into predictable behavior patterns such as “always” or “usually,” mechanical detection warning devices can be placed across the path of the smuggling vessels.

United States and allied submarines in the Pacific or the Caribbean may lie in wait to gather information (including tracking of LPV, SPSS, or submarines as they leave the harbors) and run on a finite range of course headings or through known choke points such as off the southeast coast of Cuba or the Galapagos Islands. These opportunities can be exploited, as occurred during the Caribbean U-Boat battles of World War II and the Cold War intelligence operations in the Atlantic and Caribbean. The authors acknowledge that heavy traffic of LPV and SPSS on defined smuggling routes necessitate considering the possibility that DTO will send submarines by an alternative route, less defined and thus less monitored, and along the littoral zone to take full advantage of its inherent poor acoustics for tracking submarines.

## INDICATORS RELATED TO COMMAND AND CONTROL STRUCTURES

South American DTO employing sea-based smuggling operations have developed command and control structures with loose and fixed polar ends of a continuum. The loose structure includes construction of LPV for individuals or coalitions of smugglers who pool their money and purchase a single vessel for smuggling operations for which they decide the departure time, course, and crew. Highly organized DTO encourage poorly organized independent smugglers to operate in an area targeted by law enforcement and intelligence agencies in a classic strategy that

is enormously beneficial to the DTO. This is because the independent smugglers create a rich target field for interdiction vessels to pursue and consequently deplete intelligence and law enforcement resources. In this strategy, the highly organized DTO attempts to gain the advantage of its vessels, successfully completing the mission using intelligence and counter-intelligence information they have gathered. As predicted by the Developmental Smuggling Model (a model used to both describe different smuggling organizations and the strategies they employ), what appears to be chaos, in respect to the multiple smuggling targets sighted in the Pacific and Caribbean, fits into a predictable transnational criminal smuggling strategy gestalt.<sup>17</sup>

Fixed command and control structures construct LPV, SPSS, and submarines and determine for the fleet when, where, and how smuggling vessels are sent to the Pacific and the Caribbean and how captains and crews are to return to home base. Therefore, the authors put forth as a priority the need to find indicators to identify leaders and workers in the sea-based fixed smuggling command chain and how the leaders communicate while on land, as well as the communication methods and secret codes used to communicate with sea-based smuggling vessels. Additionally, identifying the number of groups as well as nationalities of those involved in each LPV, SPSS, and submarine design and construction illuminates possible intent of the vessel or boat and thus provides warring indicators.

For example, information gathered from the 2011 Colombian submarine construction indicates that the supplies came from multinational sources such as Russia, China, and the United States,<sup>18</sup> thus offering a variety of possible leads, each of which can be traced back to one command and control center. Information derived from local sources indicated the nationalities of individuals involved in the design and construction, as well as their probable ethnic backgrounds. This information may include the locations where they obtained the training experience and the contact with the DTO necessary to be recruited for and participate in such a project, as well as who rented the facility and the probable

connection to the DTO. Technological indicators cannot gather information alone and will require human information-gathering methods.

### **INDICATORS RELATED TO SECRET CODES AND COMMUNICATION PATTERNS**

At this time, there is no evidence that LPV or SPSS, either in the Pacific or Caribbean, are communicating with each other or employing “wolf pack” smuggling tactics such as employing a lead vessel or boat to scout for interdiction ships and then signaling others to avoid detection.<sup>19</sup> However, during one South American LPV crew’s debriefing, the captain reported that operations included radio communication using codes sent and received from different locations at different times during the smuggling mission. The first set of communication consisted of an LPV sending a transmission to Colombia as often as twice a day to verify and correct course, so that each vessel would arrive at the correct time and location. The second set of communication was sent to receivers within the targeted country. When the LPV was at the rendezvous point, the targeted country’s criminal organization sent the receiving boats to meet the LPV to off-load the drugs.<sup>20</sup> Thus, it appears, at least in some circumstances, that LPV had an intersecting communication pattern: Colombian base to vessel, criminal group in targeted country such as Panama or Mexico to the vessel. It is unknown whether the Colombian base was communicating with the criminal group using the same radio frequency and codes, or switching to other methods such as the Internet, thereby creating a triangle communication pattern.

### **INDICATORS RELATED TO VESSELS IN THE SOUTH AMERICAN FLEET: A CLASSIFICATION SYSTEM**

An open-source review of South American DTO sea-based smuggling strategy indicates that DTO have expanded their surface smuggling fleet to include a “silent service” consisting of LPV and SPSS. Further, DTO have made at least four attempts to construct with the intention to launch sophisticated

SPSS and submarines to the Pacific and one attempt to use an SPSS to retrieve cargo off the coast of Spain. Comparison between the vessels and boats that were in the Sea Tigers fleet and those belonging to South American DTO reveal that the former consisted of logistic craft, attack craft, and suicide craft. Some vessels in the Sea Tiger fleet had special modifications, such as metal barbs on the front of the suicide boats to hook into the ship they rammed prior to exploding, whereas such vessels have not been captured under the control of South American DTO.<sup>21</sup>

The capabilities of vessels in the Sea Tiger’s navy reflected a different mission. For example, in a manner similar to Los Zetas (the Mexican-based DTO that employs military grade weapons and tactics to temporarily control areas on the United States-Mexico border and protect its smuggling interests) the LTTE navy was engaged in ship protection and temporary sea control, in addition to carrying out raids and delivering supplies. Thus, there are similarities and differences between the militarized capabilities of land and sea-based

DTO.<sup>22</sup> The authors searched for documents listing the types of vessels in the South American smuggling fleet that would either support or refute the premise that South American DTO have built vessels with capabilities similar to those of the Sea Tigers, such as suicide craft and armed fast water craft.

A classification system that described the various types of smuggling craft known to have been constructed and employed by South American DTO is provided in Table 1.<sup>23</sup> For purposes of discussion, the authors propose the addition of robotic submarines divided into two types: Type 1-C, which is a true submarine in that the entire vessel remains submerged except when surfacing to check positioning or refuel, similar to the US Navy Autonomous Underwater Vehicles research projects; and the second, Type 1-D, which is an SPSS controlled by an antenna that remains above the water line and is remotely piloted similar to a predator drone.

Smuggling Submarines, Torpedoes & Semi-submersibles						
Classification System						
Type	Classification	Propulsion	Cost	Number	Dive Control	Stealth
Type 1-A	Submarine	Self propulsion	Millions	Rare	65 feet to over 300 feet	Excellent
Type 1-B	Towed torpedo	Towed	Simple and cheap	Several	Depth set then towed	Moderate
Type 1-C*	Torpedo robotic autonomous	Electric	\$500,000	One	Set by software	Excellent
Type 1-D*	Torpedo robotic remote controlled	Electric	\$500,000	One	Runs just below surface	Moderate-excellent
Type 2	Semi-submersible	Self propulsion	Complex and expensive	Only few captured	Ballasting down to lower its surface profile	Moderate to excellent control over its running depth but not fully submerging
Type 3	Low-profile vessels	Self propulsion	\$250,000- 500,000	Many captured	Boat designed to run awash	Moderate minimize radar cross-section

\*Authors propose new classification

**Table 1:** Smuggling Submarines, Torpedoes, and Semi-submersibles Classification System

**INDICATORS RELATED TO SOUTH AMERICAN SMUGGLING FLEET DEVELOPMENT PHASE**

The authors identify three distinct phases of development for smuggling vessels: experimentation through trial and error (1992-2004); rapid prototyping with

increases in capability and use of SPSS (2005-2006); and the current phase of mature designs and greater standardization (2007-present).<sup>24</sup> At issue in this paper – in light of drug terror group coalitions and rebel groups obtaining submarines – is whether South American smuggling vessels will go into a next phase that entails capabilities that

could be used to attack the US homeland or US interests abroad. A possible alternative development phase for smuggling fleets is evident in a comparison between the South American drug smuggling fleet and land-based smuggling vehicles used by narco-terrorist groups operating in Mexico. In this comparison, the common feature is the behavior of DTO as they exercise control over territory. This comparison raises the question of what conditions would be necessary for example when DTO attack each other to sink, steal loads or are attacked by pirates while at sea for South American sea-based smuggling organizations to morph into the militarized developmental stage whereby they equip and operate sea vessels in a manner similar to combat-equipped land-based smuggling vehicles recovered in Tamaulipas, a northern border state of Mexico in 2011.<sup>25</sup> This question is examined in greater detail in the threat assessment section of this article.

### **INDICATORS RELATED TO TRANSFER OF SMUGGLING TECHNOLOGY**

Theories holding that advances in smuggling strategies arise from adaptation to detection methods hypothesized the existence of LPV and SPSS before any were captured. These theories suggested that smuggling organizations would transform go-fast boats, hobbyist-built submarine kits, tourist submersible “submarines,” or submersibles found working ocean-based oil rigs into craft that adapted to the interdiction pressure. Because an LPV or SPSS had not been captured, such craft were nicknamed “big foot” in reference to a mythical creature rumored to exist but not captured. Since 1992, when “big foot” vessels shifted from theory to reality, observers discovered unanticipated leaps in submarine development due to transfer of technology from sources such as the Soviet Union and former Soviet Republics (FSUR).

The amount of submarine technology transferred from professional navies to drug terrorist coalitions indicates that significant leaps forward in smuggling submarines’ capabilities must be anticipated. For example, although arguments have been presented that the Ecuador submarine was

“crude” (i.e., not capable of diving below sixty-five feet), the counter argument is that the submarine was constructed without unnecessary expenditures – diving to that range effectively neutralized thermal imaging capabilities. The submarine’s efficient design supplanted that of the overwrought Bogota 2000 steel double-hulled smuggling submarine design. The Ecuador submarine was covertly constructed in a jungle, in hope of avoiding the fate of the Cartagena/Facatativa Colombia submarine (2000) that was detected while undergoing construction in the village of Cartagena, Colombia. In addition, the Timbiqui, Colombia, smuggling submarine (2011) was outfitted with essential technology to enhance its anti-detection capabilities, demonstrating that the designers adapted to recent interdiction methods using thermal imagery detection technology on overhead flights. With respect to construction, the authors noted that drug terrorist coalitions reverted to the prior strategy in that the 2011 Colombian submarine was detected hidden in a jungle in the Timbiqui region.

Although LPV have a lower upfront cost, smugglers may reasonably turn to submarines as a cost-effective alternative, employing leapfrog advances gained from technology transfers, requiring fewer total crew members for the “silent smuggling service,” increasing range and covert mission time, and enabling round trips using internal fuel tanks. Moreover, professional submariners have been trained and conditioned to spend months at sea operating complex machinery and to remain silent about their missions. These professionals are available from a variety of sources, including FSUR.<sup>26</sup> Alternatively, if DTO do not want to rent an FSUR captain or crew, Russia is offering submarine courses and training, including purchasing or renting submarines to a number of countries – India, Iran, China, Poland, Romania, Algeria, and Vietnam – with a deal to upgrade Venezuela’s old submarines.<sup>27</sup> The transfer of technology through criminal- as opposed to state-sponsored agreements must also be considered.<sup>28</sup>

Based on this reasoning, South American DTO inevitably will exploit technology transfers and training opportunities. Thus, it

would be beneficial to know which individuals from South America attended submarine training programs (in such places as the training center in Sosnovyy Bor near St. Petersburg) and what, if any, connections they have to smuggling or terrorist organizations.<sup>29</sup> In many respects, the FSUR submarine training programs are similar to the flight school the 9/11 terrorists attended. Given the technical assistance and transfer of technology from the former Soviet Union, smuggling submarines now have a significant tactical advantage: once at sea, there may rendezvous with cargo ships carrying drugs and fuel far away from traditional smuggling routes. These vessels will likely have been purchased or controlled by a DTO, which would likely provide a command vessel disguised as a trawler for insertion of smaller manned or robotic submarines.<sup>30</sup>

Also, the smuggling submarine can use professional submariners and thereby leapfrog ahead in operational methods, such as remaining submerged as it approaches, off-loading within a targeted country's territorial waters, or moving into the littoral zone in a manner similar to an SPSS. In terms of gaining tactical advantages, the authors argue that it is reasonable to anticipate that DTO will upgrade as the technology is obtained from the Type 1-B torpedo to the Type 1-C or Type 1-D. Finally, the authors posit that just as submarine technology was transferred from DTO based in South America to others based in Southern Europe, DTO will transfer the Type 1-C and Type 1-D technology to African- and European-based enterprises as well as to terrorist groups.

### **INDICATORS OF CHANGE IN SMUGGLING FLEET STRATEGY**

Go-fast vessels continue to represent 40 to almost 50 percent of trafficking in the maritime environment, however, there has been a decline in the use of LPV and SPSS after they peaked in 2008.<sup>31</sup> A critical factor in this decline was the arrest of key criminals by employing the Maritime Strategic Doctrine (i.e., Operation Panama Express, the multiagency organized crime drug enforcement task force). The arrest of

Colombian national Enrique Portocarrero (nicknamed Captain Nemo) was key because it was reported that he was the principal builder of about a third of the LPV in 2003, although where the plans came from is still not clear.<sup>32</sup> The arrest in Argentina of Ignacio Alvarez Meyendorff, one of the main organizers of a DTO submarine building operation, reflected the pressure applied through the Maritime Strategic Doctrine. The suspect, also known as "Old Man" and "Big Brother," was identified as working for the Colombian Norte del Valle drug cartel. It's believed that Meyendorff was tracked down via information obtained by the US Office of Naval Intelligence and the Drug Enforcement Agency.<sup>33</sup> Many other factors could account for the decrease of smuggling craft spotted at sea:

- Limited number of craftsmen, such as Portocarrero, with the dry-dock skills to build vessels. Even if the drug traffickers are able to mass-produce vessels, the arrest of that one builder has a profound impact on the construction rate.
- Drug traffickers reverting to go-fast boats with advancements in packaging that adjust for shifting fuel and cargo loads while at sea.
- Smuggling vessels navigating within the territorial waters of each country as they travel north with the goal of avoiding international waters where the multinational drug interdiction forces are most likely to patrol.
- Recent attempts by the Colombian government to control the availability of fiberglass used to construct the LPV.<sup>34</sup>
- Appeal of successful land-based smuggling methods such as tunnels that transport multiple contraband.<sup>35</sup>
- Discovery of construction sites, thus shifting DTO strategy back to land and air methods.
- Decrease in the availability of LPV and SPSS captains and crews.

## **INDICATORS RELATED TO CONSTRUCTION WORKERS, CAPTAINS, AND CREWS**

Available information indicates that LPV in the Pacific and the Caribbean are piloted and crewed by Colombian nationals, with notable exceptions. For example, during Operation Panama Express, a smuggling vessel interdicted off the coast of Costa Rica had among its crew four men: two Colombians, a Guatemalan, and a Sri Lankan Tamil, who claimed that he was a resident alien of Colombia.<sup>36</sup> However, as of yet, there are no open source documents that indicate the nationality, training, and recruitment of any of the submariners who would have crewed either the Colombian or Ecuadorian SPSS or submarines.

LPV sent to sea from organizations with fixed command and control structures consist of a captain, two or three crew members who work in twelve-hour shifts, and an enforcer, as described by one LPV captain who talked to a news reporter. Somewhat analogous to a Russian political commissar or politruk, the drug enforcer's loyalty is to the DTO and not to the captain and crew. In contrast to the political commissar of the USSR, the drug commissar aboard an LPV has the authority to countermand the sea captain's orders and, as such, is responsible for maintaining crew discipline with authorization to use lethal force. Moreover, the LPV commissar is the individual who informs the LPV captain of the course and rendezvous point after the LPV has been towed to sea and cut loose. Available information regarding LPV captains suggests that they may be licensed sea captains, may have successfully completed smuggling runs on surface vessels, may have completed previous LPV missions, and may have knowledge through prior experience of avoiding the targeted countries' radar and sonar.<sup>37</sup>

## **DRUG TRAFFICKING VESSEL INTERDICTION ACT: DEBRIEFING CAPTAINS AND CREWS**

With the passing of the Drug Trafficking Vessel Interdiction Act (DTVIA), LPV and SPSS captains and crew can be arrested and

prosecuted even after they have scuttled the vessel. The opportunity to debrief captains and crews provides opportunities to gather detailed information regarding all the events from their recruitment to arrest, which can be used to develop a quick interdiction response. There is little open source information about crew members, but what is known suggests that use of submarines implies military training.<sup>27</sup>

The case of Enrique Portocarrero serves as an example of how to capitalize on the arrest of sea smugglers and demonstrates the importance of analyzing each individual's background. Portocarrero led a double life as a shrimp fisherman in Buenaventura, Colombia, and has been credited as the creator of LPV, having designed and constructed, in a mangrove swamp twenty miles south of the city, as many as twenty fiberglass Type 3 vessels. Each LPV was a custom design detailed to the specifications of the packaging and weight of the cargo to be smuggled – thus the variations inherent in Portocarrero vessels, from Buenaventura in South America to Central America and Mexico. The Type 3 construction included innovations such as a bow that produced very little wake, a conning tower that raised only a foot above the water (implied Type 2 SPSS), and a valve system that enabled the crew to scuttle the SPSS or LPV in ten minutes. Portocarrero developed a signature design: a sleek V-shaped hull, a sturdy keel, and an exhaust system that reduced the thermal image. At the time of his arrest, Portocarrero had \$200,000 hidden in the spare tire of his car. He had invested his reputed \$1 million per-vessel fees to purchase five shrimp boats. The extent to which the shrimp boats served as tenors or spotters is unknown.<sup>38</sup>

Captured crew members refer to LPV as floating coffins. The authors surmise that this reference illustrates the drop-off of potential crew members willing to make more than one trip. An additional problem for smugglers is that the effectiveness of LPV stealth measures, such as running diesel smoke underwater and shielding hot engines with lead pads to avoid detection, is limited by the crafts' structure.<sup>39</sup> The authors propose that these factors, weighed against the inherent positive factor of the covert nature of smuggling submarines capable of operating

in the littoral zone and the transfer of technology and engineering capability from FSUR, make the smuggling submarine an attractive alternative and natural progression from the LPV. Thus, similar to the hypothesis regarding a “big foot” progression from go-fast boats to LPV, once the leapfrog in technology and operational skill is included, the authors support the likelihood of a progression from LPV to smuggling submarines. The capture of the sophisticated SPSS and smuggling submarines in Colombia in 2000, Ecuador in 2010, and Colombia in 2011 (with the 2010 and 2011 discoveries occurring within eight months of each other) is worthy of concern when placed on a time line. The probability that drug terrorist coalitions are engaged in multiple ongoing sophisticated SPSS and submarine construction projects should be considered.

#### **TRANSFER OF SMUGGLING TECHNOLOGY: THE CASE OF THE ENGINEER FROM SPAIN**

Inferences that DTO intend to expand LPV, SPSS torpedoes, and submarine operations to the Atlantic have been voiced.<sup>40</sup> The strategic advantages of employing covert measures, rather than speed alone in smuggling operations, especially across vast distances, have been understood for some time. “When speed no longer won the day, traffickers, to avoid detection, turned to parasitic devices on the bottom of ship hulls, towed array devices and ultimately LPV and semi-submersible boats.”<sup>41</sup> It is surmised that technology from South American DTO will appear in Africa and Southern Europe, and there is speculation that the FARC will use Brazil to move drugs to these regions.<sup>42</sup>

Such conjecture is founded on the belief that Type 1-B torpedoes and Type 3 vessels have been interdicted while being towed by a larger ship off the coasts of Africa and Southern Europe. The authors were unable to locate any news or government reports of LPV, SPSS, or submarines off the coast of Africa. However, LPV and SPSS are reported to have been found in Spain and Sri Lanka, raising the issue of the vessels’ origins.<sup>43</sup> The Office of Naval Intelligence team calculated that the Ecuador submarine had a range (on

internal fuel) of about 12,000 kilometers, which supports the position that DTO have achieved the technical ability to construct a boat that could launch from the east coast of South America, cruise the Atlantic, and reach Africa and possibly Southern Europe or, alternatively, leave the west coast of South America and reach into the United States.<sup>44</sup> The authors searched newspapers and government documents in South America, Africa, and Southern Europe to locate documented cases of successful LPV, submersible, or submarine transatlantic smuggling operations originating from the east coast of South America. The authors could locate stories that speculated that an SPSS Type 2 vessel had crossed the Atlantic. However, they could not find any evidence that submarines Type 1-A or SPSS Type 3 had either been towed or had cruised from South America to the coast of Africa or Southern Europe.

The search indicated that in 2006 the Spanish Civil Guard followed up on a telephone tip and found what they reported as a Type 2 SPSS, which contained no drugs, in an inlet near the Atlantic in Spain’s northwestern Galicia coastal region.<sup>45</sup> There was no indication that either an SPSS or submarine had been towed from South America to the African or Spanish coastline.

Further searches of Spanish documents indicated that in 2009, during the beginning of the legal case regarding the captured smuggling SPSS in Spain, Spanish media reported that Manuel Clemente, alias “The Engineer,” built a nine-meter Type 2 SPSS in his garden shed at his home in Galicia. The SPSS was discovered by police empty of drugs but with its motor running, afloat off the coast of northwest Spain. It had room for one person, who received oxygen from a pipe that stuck up above the surface, fitting the description of a Type 2 SPSS. The smuggling method entailed Clemente accompanying the SPSS to a rendezvous point off the Spanish coast in a yacht. Clemente’s only avoidance tactics were scanning the horizon for patrol boats. His intent was to meet the Colombian boat containing the cargo, load the drugs, and then travel to the Spanish coast. Clemente reported that a Colombian drug cartel had paid €100,000 for the SPSS to be built in the

hope that it could imitate the success of similar SPSS.

The case of the Spanish engineer points up four crucial concepts in the development of indicators for sea-based smuggling. First, with respect to the transfer from one continent to another of SPSS smuggling technology by a criminal enterprise, Clemente alleged he received the blueprint for constructing the SPSS from a Colombian DTO. Second, Clemente reported that the man hired to pilot the SPSS jumped ship when it began to behave erratically on its first mission. Clemente then made sure the SPSS was discovered so he could tell the Colombians he had been the victim of a police raid rather than explain to the Colombians that the SPSS did not function as expected or that the pilot abandoned the vessel. The authors also note the difficulty Clemente experienced recruiting a pilot with the skill and knowledge to handle the smuggling vessel. It is unknown whether the blueprints for the SPSS were based on a design for operations in the littoral zone on the west and north coasts of Colombia and thus had flaws that impeded the vessel's operation in the littoral zone in Spain.

Third, with respect to the difficulty in constructing the vessel and transporting it to the sea, the police did not need to be told about the vessel because they had been tailing Clemente after spotting his SPSS during one of their many trips to the local docks. The difficulty Clemente experienced while trying to build a sea smuggling vessel, along with the problem of how to get the vessel to the sea, is universal in that smuggling vessels built in Colombia and Ecuador face similar difficulty in avoiding detection. Thus, the construction of the vessel, transportation to sea, possible reassembly of the vessel prior to launch, as well as the specifics of launching the vessel, present discreet phases for evaluation from a strategic warning perspective. The importance of gathering land-based intelligence during any one of these distinct phases is similar to the type of intelligence gathered about submarines from the Sino-Soviet Bloc in the modified Ramsey and Borner model. This may include any offensive capabilities – internal or external torpedoes, mine laying apparatus, and diver

lockout chambers – that a smuggling submarine might possess.

Another important indicator in the case of the engineer from Spain is the importance of geography in developing strategic threat assessments about where (what type of littoral zone and sea conditions) and when (daylight versus nighttime) smuggling craft are launched. If specific times and locations are known, space-based data collection platforms, unmanned aerial vehicles, or reconnaissance aircraft can be employed to support human intelligence collection efforts. One source opined, based on an analysis of Clemente's vessel, that it was not closely related to the Colombian subs in design. For example, the vessel was made from steel, had ballast tanks on the flanks, and used separate propellers for the diesel (main) and electric drive. This critic of the Spanish SPSS concluded that the craft was likely intended for short transits between the cargo ship and shore and not for long Atlantic Ocean cruises.<sup>46</sup> The authors observe that steel rather than fiberglass has been found in Colombian constructed LPV. Thus, a hull other than fiberglass may not be a telltale sign of the origin of design origin.

#### **INDICATORS DERIVED FROM LOCATION OF CONSTRUCTION SITES**

The Soviet Union's hidden submarine base at Balaklava – carved in rock and offering sea and bay entrances that submarines could use while remaining submerged – was similar to South American DTO facilities in specific geographic areas under the control of the FARC, which offer specific advantages for covert operation. The South American DTO use the triple jungle tree canopy that blocks or retards satellite penetration to cover their behaviors and intentions. There has been one attempt to use a metal-covered construction building in a remote location. Thus, two factors assist in narrowing the area to be searched. The first is that the areas are under the control of the FARC and secondly, the areas shield the construction from overhead surveillance. Analysis of the Sea Tigers construction sites is instructive because the group had developed boat-building "shipyards" and a system by which the vessels

would be taken by trailer to a launching site, complete a mission, placed back on a trailer, and hidden again in the jungle. The authors note that construction of a submarine, possibly by an independent enterprise outside of those protected by the FARC but within an area where a variety of rebel groups resided, was discovered in 2000 in Colombia.

### **FORMER SOVIET UNION'S DISTRIBUTION OF LITTORAL ASYMMETRIC WARFARE TECHNOLOGY**

The 1992 Navy and Marine Corps White Paper "...From the Sea" and its follow-on "Forward...From the Sea" (1995) recognized the dissolution of the USSR and the end of the Cold War (1989-1991) and logically predicted the increased importance of the littoral battle space.<sup>47</sup> However, the white paper understandably did not foresee the rise of the drug terrorist coalitions' blatant development of smuggling submarines, rebel groups constructing their own submarines, or the USSR or FSUR selling or leasing submarines and/or crews and providing training facilities for anyone who wishes to acquire the knowledge and skill to pilot a military grade submarine. It is reasonable that astute intelligence and counterintelligence officers were not surprised to learn that the power vacuum resulting from the readjustment of sea warfare policies of the two great navies of the world would be filled by transnational crime and terrorist groups.

A further outcome was that Ludwig Fainberg, a.k.a. "Tarzan," proposed a deal to sell a Tango class diesel-powered patrol submarine to move cocaine from Colombia to the coast of California with the plan that drugs, packed into capsules attached to buoys, would be fired through the submarine's torpedo tubes and float at sea until speedboats made the pickup.<sup>48</sup> The submarine was based in Kronshtadt, a large Russian submarine base on the Gulf of Finland, off St. Petersburg. During the negotiations, the price of the submarine, which included a crew of twenty for a year, dropped from \$9 million to \$5 million. The deal fell through when the Colombians backed out, apparently feeling such an

enterprise was too ambitious.<sup>49</sup> Ludwig Fainberg was also accused of trying to sell eight Mi-8 military helicopters. What is notable about Fainberg's failed logic was the assumption that a Russian Tango class submarine could repeatedly fire torpedoes off the coast of the United States without having been trailed to the area or that the noise of the multiple torpedo launches would go undetected or ignored.<sup>50</sup> The authors deduce that the DTO reasoned that operating a military grade submarine off the coast of the United States was inviting a military rather than a law enforcement response, thus inviting a disaster.

### **SOUTH AMERICAN DRUG TRAFFICKERS' AVOIDANCE OF MILITARIZATION**

A review of smuggling vessels discovered in South America shows that none of the designs include torpedoes, mine laying features, diver lockout chambers, or armor plating. The avoidance of militarization of the LPV, SPSS, and submarines is a significant indicator. The authors argue that detection of any one of the four features in smuggling submarine armor –plating, weapons (e.g., either internal or external torpedo systems, etc.), diver lock out, or mine laying capabilities – would be a significant indicator and signal a profound shift in DTO intentions. Given the expense of constructing a submarine, it appears unlikely that using one as an explosive would be a reasonable cost-effective means to strike at an enemy. Potential vessels in the smuggling fleet that could reasonably be modified for littoral warfare are Type 1-C and Type 1-D, as well as Type 3 vessels.

The general consensus that robotic Type 1-C and Type 1-D submarines were too unpredictable to be used by smuggling organizations was rejected by the findings from Operation Panama Express. The operation identified three men, Gustavo Garcia-Velasquez, Lope Lopez-Ortega, and Carlos Vera, each with their own specialty: an electrician, a fiberglass fabricator, and a facilitator who arranged meetings between remote controlled submarine makers and potential buyers. The three men pleaded guilty in US District Court in Tampa, Florida,

in a conspiracy that goes back to 1997. “The remote-controlled vessels — up to 40 feet long — are smaller than the manned SPSS, which are up to 70 feet long,” said Joseph Ruddy, an assistant US attorney. “The remote-controlled vessels can carry up to 1,800 kilograms of cocaine and cost about \$500,000 to make, according to court documents. They have a range of about 1,000 miles without refueling, but they can be refueled at sea.”<sup>51</sup>

### **UNITED STATES NAVAL ENGAGEMENTS IN LITTORAL OPERATIONS: LESSONS LEARNED**

Since 2000, there have been three attacks on US Navy ships. On January 3, 2000, there was a failed attack by al-Qaeda using a boat full of explosives against the Navy destroyer USS *The Sullivans*, while in port at Aden, Yemen. On October 12, 2000, there was a successful attack on the destroyer USS *Cole* while it was harbored and refueling in port at Aden. Both attacks used small surface vessels. Analysis of transfer of sea-based smuggling technology and applied behavioral analysis of sea-based terrorist actions suggests a link between the LTTE and the al-Qaeda attacks in 2000. Specifically, the LTTE suicide attacks at sea are also said to have inspired other groups, including al-Qaeda. Sea Tigers often boast that it was their suicide attacks on Sri Lankan vessels, the *Abitha* and *Edithara*, that al-Qaeda emulated when it attacked the USS *Cole*.<sup>52</sup>

As a result of the USS *Cole* bombing, the US Navy began to reassess its antiterrorism and force-protection policy and methods, both at home and abroad. The Navy stepped up Random Anti-terrorism Measures (RAM), which are meant to complicate the planning of a terrorist attack by making it difficult to discern a predictable pattern to security posture.<sup>53</sup> The Abdullah Azzam Brigades claimed responsibility for firing at least three rockets at a US amphibious assault ship while two ships, the *Ashland* and the USS *Kearsarge*, were docked at Aqaba, a Jordanian port on the Red Sea, in 2005.<sup>54</sup> Two of the rockets were Katyushas, highly inaccurate, unguided weapons used by Lebanon’s Hezbollah guerrillas to attack

northern Israel. There have been a number of ships, such as *The Liberty Sun*, flying an American flag while carrying food aid for CARE and the World Food Program that were attacked by Somali pirates in 2005, and the number is likely to continue to rise.

### **RECENT ATTACK OF A NAVY SHIP BY A SMALL SUBMARINE**

The question of whether a mini-sub (which the Sea Tigers had in their terrorist smuggling fleet) has been used to attack a navy ship since 1941 was answered in the affirmative when the South Korean government announced that a 60-foot North Korean Yeono class (or alternative spelling “Yono”) submarine fired a torpedo that sank the South Korean corvette *Cheonan* in March 2010.<sup>55</sup> South Korea also declared that North Korea had a larger midget submarine, the *Sang-O*, on patrol in the area when the Yeono class mini-submarine attacked the South Korean ship.<sup>56</sup> As proof of the attack, South Korea announced that a civilian ship hired to dredge the area of the attack found remains of what South Korea classified as a CHT-O2D torpedo, made in North Korea.

That torpedo would have a big enough warhead, 250 kilograms, to destroy the corvette. Vice-Admiral Hwang Won-dong, who led the intelligence analysis unit of the investigation team, reported that after the provocation, the submarine “promptly returned to waters north of the Northern Limit Line (NLL) by back tracking the infiltration route.” The vice admiral reported,

We do not know whether the North observed the *Cheonan* in advance to attack it. But we believe that North Korean submarines must have undergone prior military drills, including firing a torpedo, in waters similar to those in which the South’s frigate was sunk. We detected that a few small submarines and a mother ship supporting them left a North Korean naval base in the West Sea 2-3 days prior to the attack. “No. 1,” a handwritten mark on the rear part of the torpedo collected from the sinking site, is consistent with markings on a stray North Korean torpedo the South recovered seven years ago.<sup>57</sup>

Government reports state that the ship's sonar did not detect the submarine or the torpedo.<sup>58</sup>

### **DIRECT ACTION AGAINST COMMAND AND CONTROL**

Unlike the command and control of the Sino-Soviet Bloc analyzed in the Ramsey and Borner model, current authorities are working to remove DTO leadership. Law enforcement efforts to identify and arrest members involved in sea-based smuggling conspiracies — from fabricators to leadership of DTO through Operation Panama Express and specifically those involved in LPV, SPSS, and submarine operations — will, over time, have an impact on DTO sea operations using LPV, SPSS, and submarines. Moreover, if key, difficult-to-replace smuggling fleet strategists, such as Meyendorff, are arrested, it follows that until the strategists can be replaced, there is a deficit in the ability of the DTO to respond to constant changes and advances in interdiction sources and methods. In the event that the DTO engage in terrorism, the issues emerge of the impact of removal of DTO leadership by military capture or kill methods.

A critical observation is what occurred to the Sea Tigers who were confronted by a military response, in large part due to the terrorism of the land-based operations. Specifically, the death in April 2009 of Colonel Soosai, a key leader in the LTEE and referred to as the Admiral of the Sea Tigers, brought an immediate end to the independent Tamil state civil war and thus the Sea Tigers' sea-based smuggling and terrorist operations. His death preceded that of Velupillai Prabhakaran, the leader and founder of the LTEE, killed in fighting with the army on May 18, 2009. The deaths of Colonel Soosai and Prabhakaran, the remaining command and control structure during military operations, and the demise of the LTEE raise the issue of the longevity of terrorist organizations that use sea-based terrorism once the leadership is removed by a military response that is absolute and final. These issues also prompt a comparison to the demise of about 50 percent of the FARC membership and whether the FARC has the

leadership capability to construct and operate a smuggling terrorist fleet.<sup>59</sup>

### **THE MODIFIED RAMSEY AND BORNER MODEL**

The Ramsey and Borner method of applied behavioral analysis for identifying indicators and formulating strategic warnings regarding the Sino-Soviet Bloc was appropriate at the time, given the geopolitical complexities of the waxing and waning relationships among the members of the Sino-Bloc prior to the collapse of the Soviet Union. The method remains relevant given the similar state of relationships among members in the drug trafficking terrorist coalition today.

In a similar vein, both DTO and rebel groups proclaim political doctrine that is diametrically opposed to their behavior. In the case of the drug traffickers, the pronouncements that they are nonpolitical and interested only in profit does not match their behaviors of controlling the government through intimidation, bribes, assassination and terrorist acts. The rebel groups' pronouncements — that they are political and not profit-driven and want to change the government through intimidation, bribes, assassination, and terrorist acts — do not match their participation in drug trafficking. Both groups seek to dominate specific areas of the world to satisfy their own wants and what drives the tension is that both groups need to control the political process in their countries by similar methods. As the drug organizations and the terrorist groups strive to control the government and compete against each other for resources, the distinctions between them blur, especially when there is a coalition.

The contradiction between alleged belief and behavior must be analyzed within the geopolitical context of the region when completing threat assessment, exercising risk management, and formulating policy decisions. At times, there is shifting on the crime-terror nexus within and among the three different group clusters — drug terrorist coalitions, DTO, and terrorist/rebel groups — with such speed that separation of terrorist from criminal becomes blurred.<sup>60</sup> The shifting dynamic within and among the

different members of the drug terrorist coalition complicates the identification of indicators and generation of strategic warnings. The threat analysis of a potential attack on the United States is juxtaposed over the three competing groups: drug terrorist coalitions, DTO, and terrorist groups. Unlike the Ramsey and Borner model, which considered one command and control structure, the South America threat assessment must consider these three separate command and control structures.

Within this juxtaposed template laid over the Ramsey and Borner model is the possibility that for-profit terrorist groups, such as Hezbollah operations in South America, may advance from a profit-generating smuggling mission to carrying out a political mission, either directly or in a scenario similar to Abdullah Azzam Brigades' rocket attack. Alternatively, the possibility that the FARC may advance to sea-based smuggling for profit must be calculated. Furthermore, the possibility that a drug trafficking organization may decide to engage in terrorist attacks against a Coast Guard vessel or land-based police force must be considered. As a means of organizing the above waxing and waning factors, as well as organizations' proclaimed political doctrine that is diametrically opposed to their behavior, the authors offer the HCR-20, a forensic behavioral science method of threat assessment that divides hostile intentions and behaviors into historical, clinical, and risk management components.<sup>61</sup>

The historical component is the collection of the behaviors that have occurred in the past and are fixed. For example, al-Qaeda, Hezbollah (through the Abdullah Azzam Brigades), and the Sea Tigers all demonstrated a history of sea-based terrorism. The Sea Tigers proclaimed their intentions to kill Sri Lankans and other nationals and did so during sea-based terrorist acts. Thus, these organizations had a history of terrorism, reported they believed in committing terrorist acts, and therefore only needed the opportunity and means to commit the terrorist acts. With respect to the South American DTO, there has been no stated goal of killing Americans or their allies using sea-based terrorist operations. However, using a behavioral science threat perspective

historically, the behaviors of DTO in North Central and South America have repeatedly demonstrated acts using military and terrorist strategies and tactics.

The clinical section of the threat assessment includes the contradiction between alleged belief and behavior or intentions. In the case of al-Qaeda and Hezbollah and Abdullah Azzam Brigades, there is no discrepancy between intentions and behaviors inasmuch as both claimed their intentions to kill Americans. The clinical assessment addresses what would need to change for South American DTO or the FARC to engage in sea-based terrorist attacks. Given that the DTO and the FARC have engaged in land-based terrorism — the former in North and Central America and the latter in South America — the issue for threat analysis is identifying which factors caused a change in the belief that sea-based terrorist acts would be in the best interest of the organization.

Applying threat assessment methods to DTO, narco-terrorists, and terrorist organizations using a behavioral science assessment of hostile actions calls for a third component, known as risk management, which considers the availability of tools for behaving in a manner consistent with a group's belief system. For example, equipping go-fast boats with barbs on the bow would not be consistent with a smuggling terrorist group's stated beliefs that it is only intending to engage in smuggling operations. Thus, although a DTO, such as the Colombian Norte del Valle, may report that it has no intention to engage in sea-based terrorism, its history refutes that assertion, and the collection of tools such as outfitting or equipping smuggling craft with terrorist capabilities also refutes that assertion, therefore raising the strategic threat warning.

The following threat matrix draws upon the authors' collection of information about sea-based smuggling crews, captains, communication patterns, avoidance tactics, technology, and strategic planners. The matrix also includes the structural advances in vessels and boats and whether the advances were similar or different from those used by military or terrorist organizations with sea-based capabilities. To address the

risk management component of the HCR-20 and in keeping with the Ramsey and Borner Model, a threat matrix is presented below that includes the information about sea-based smuggling operations without terrorist intentions or preparations and terrorist sea operations that had specific terrorist

intentions and preparations. In a manner similar to the Ramsey and Borner Model, different types of sea-based hostile actions that can take place and the different types of hostile behaviors that raise the potential for hostile action are offered.

Indicators	1	2	3	4
<b>Section A: Leadership and Crew</b>				
Loose—no command and control structure All crew agree to smuggling drugs—no political affiliation			X	
Loose—no command and control structure All crew agree to smuggle drugs; political affiliation among crew	X			X
Tight command and control structure All crew agree to smuggling drugs; no political affiliation			X	
Tight command and control structure; all crew agree to smuggling; political affiliation with command staff	X	X		
<b>Section B: Financing of Construction</b>				
Drug trafficking organization			X	
Coalition of drug traffickers who commissioned the boat			X	
Terrorist organization	X			X
Coalition of drug traffickers and terrorists	X			X
<b>Section C: Weapons</b>				
Release of controlled weapons and equipment to crew—grenade launchers	x			
Release of controlled weapons and equipment to crew—assault weapons	X			
Limited automatic weapons on board—one firearm to drug commissar			X	
Crew military trained	X	X		
Captain military trained	X	X		
<b>Section D: submarine vessel construction</b>				
Vessel outfitted—armor plating	X	X		X
Vessel outfitted—deck gun	X	X		X
Vessel outfitted—explosives	X	X		X
Diver lock out	X			X
Mine laying ability	X			X
Stealth avoidance only			X	X
<b>Section E: Course of vessel submarine, torpedo, low profile</b>				
Military installations	X			X
Military ships in harbor	X			
Fixed target of civilian opportunity—oil rigs	X			
Fixed target of civilian opportunity—oil carrying vessels, etc. (time of shipping on same course)	X			
Course avoids military installations			X	X
Course avoids civilian targets			X	X
<b>Section F: Submarine, low profile arrangement for crew’s return</b>				
Arrangement made			X	X
No arrangement made	X			
<b>Section G: Threats</b>				
Threats and intimidation to crew if captured; family will suffer		X	X	
No threats or intimidation to crew if captured	X			
<b>Section H Money paid to crew</b>				
Money paid to crew, around \$3,000			X	
No money paid to crew or crew; had to account for money spent; receipts	X			

**Table 2:** Threat Indicators

**Types of Actions**

1. Terrorist premeditated surprise attack mission to attack military or civilian targets
2. Escalation at point of interdiction/ability to attack if interdicted
3. Drug trafficking smuggling run—no means to attack
4. Terrorist trafficking smuggling run—no intent to attack but will attack to defend shipment

The Ramsey and Borner Model offered the indicators and type of hostile intentions to intelligence analysts to assess the weight of each indicator against each type of smuggling, terrorist, or coalition group and the type of threat they pose. The authors endorse a similar approach in completing an analysis from diverse groups — Coast Guard, Office of Naval Intelligence, Drug Enforcement Agency and Central Intelligence Agency.<sup>62</sup> The analysis from each group must determine the weight given to each indicator in the table above, based on knowledge of DTO, narcoterrorists, or terrorist groups using the sea-based smuggling method.

## SUMMARY

*When the mass of the information has been collected, the art is to sift the wheat from the chaff, and then to lay before the commander a short clear statement.*

*Field Marshal Earl Alexander*

This article has presented a model of South American drug traffickers, drug traffickers' terrorist coalitions, and narco-terrorist groups that use sea-based smuggling methods. The model is based on the analysis of behavior intentions and strategic thinking, yielding threat assessment. The model yielded four possible attack scenarios. The historical actions of South American sea-based drug trafficking organizations support the conclusion that the current strategy of DTO is to exploit the weaknesses of coastal defenses in Central America and Southern Europe. This study supports the position that the strategy of South American traffickers developing submarines is to attempt to use the submarine technology to leap ahead of sea-based interdiction methods. The authors contend that behavioral indicators suggest a non-terrorist strategy as part of South American DTO sea-based smuggling.

The developmental progress within and between LPV and SPSS indicate clear intent of South American DTO to avoid militarization of their fleet, while simultaneously neutralizing intelligence and law enforcement detection during smuggling operations. The developmental progress

within and between smuggling vessels, when compared to the LTTE terrorist navy, does not indicate South American DTO have any intent to carry offensive weapons. The study of littoral terrorist warfare indicates that attacks on US Navy ships have been from small open-craft surface vessels that were similar to small open-surface vessels used by the LTTE to attack the Sri Lanka navy.

There has been one land-based rocket attack on US Navy ships while in a harbor. The 2008 Mumbai attack, employing small open craft to insert terrorists into the country, is similar to both LTTE and North Korea terrorist operations with the understanding that North Korea has also employed mini-submarines to insert terrorist kill teams into South Korea. Littoral warfare involving submarines attacking navy ships has been conducted by North Korea and included a torpedo attack on a South Korean ship at sea. There is no indication that any South American drug smuggling organization or drug terrorist coalition has constructed a submarine with the purpose of inserting covert operatives or a torpedo system.

During the previous five years, the United States has evaluated specific behaviors of South American sea-based drug smugglers, such as scuttling vessels at sea, and has responded by passing the Drug Trafficking Interdiction Assistance Act of 2008. In response to the small open-vessel attack and a rocket attack on US Navy ships in harbors, the Navy responded by rewriting its Random Anti-Terrorism Measures. Recent successes of Operation Panama Express support the law enforcement approach inherent in the Maritime Strategic Doctrine for dismantling South American sea-based smuggling organizations. Drug traffickers have built submarines on the west coast of Colombia and Ecuador, which makes operating them in the Pacific far more probable than the Atlantic. Drug terrorist coalitions, although demonstrating the technological expertise to construct a submarine, have not demonstrated the capability to launch a submarine from the east coast of South America with a crew proficient to navigate the Atlantic Ocean on a cruise to Africa or Southern Europe.

A significant indicator will lie in the nature of the training, be it military or civilian, and the political and religious beliefs of the captain and crew prescribing to radical jihad. Currently, indications are that the captains and crews aboard smuggling vessels remain nonpolitical and are not religious extremists. Changes in the crew makeup would be a significant indicator, as would vessels with defensive or offensive weapons. Once the smuggling vessels are outfitted with defensive weapons (anything with more firepower than a single assault rifle) among the entire crew, there is significant potential for a Type 2 Action confrontation between members supporting the Maritime Strategic Doctrine and drug traffickers at sea. Once defensive weapons are aboard sea-based smuggling vessels, the drug traffickers have signaled a profound shift in strategic thinking, implying a willingness to defend the smuggling shipping lane with force, not unlike the defense of the land-based smuggling lanes in Central and North America.

The authors are aware of the danger of being unprepared when confronting an adversary who has made the strategic shift from a criminal response to one of terrorism. The comparison between terrorist strategies and tactics used by land-based drug traffickers (i.e., Mexico) and South American drug traffickers militarizing their vessels and boats is a significant warning to policy makers. In the event that drug organizations pursue the use of submarines with the capability to penetrate US territorial waters, a reevaluation of current doctrine and policies must take place prior to a confrontation. Although some would argue that an immediate policy review will escalate tensions, the authors vehemently disagree and maintain that it is the drug traffickers who would have escalated the situation at sea – an environment that is inherently dangerous and unforgiving. The LTTE terrorist tactics at sea and the DTO land-based terrorist tactics in Central America are precisely the type of terrorist behaviors that must be resolved quickly. Traditional antisubmarine warfare against drug traffickers in the littoral zone will require the United States to plan for defending civilian targets traditionally off limits during time of war.

At least one South American drug organization transferred advanced smuggling technology to Southern Europe and attempted a smuggling operation using a Type 2 vessel. Buenaventura vessels cruise the Pacific and rendezvous off the southwest coast of Mexico with smugglers who transport the drugs inland. The authors' position is that the smuggling technology most likely to be transferred to a terrorist organization is Type 1-C and/or Type 1-D. The most likely conflict at sea will be a Type 2 Action. If terrorist-based rebel groups in South America acquire vessels or a boat, Type 1 and Type 4 actions are probable.

## ABOUT THE AUTHORS

**Terrance G. Lichtenwald** maintains a private practice in clinical psychology conducting psychological, forensic, and threat assessments. His research interests include application of the Developmental Smuggling Model and Fraud Detection Homicide. Dr. Lichtenwald earned his bachelor's in broad field social studies and psychology from the University of Wisconsin-Madison and a master's in school psychology from the University of Wisconsin-Whitewater. He earned a second master degree and doctorate in clinical psychology from the California School of Professional Psychology-Fresno. He may be contacted at [tgl3155@aol.com](mailto:tgl3155@aol.com).

**Mara H. Steinhour** has a master's in clinical psychology from the Illinois School of Professional Psychology and a bachelor's from Rockford College. Her work experience includes the finance industry, as well as working in loss prevention for federated department stores. Her interests are in translation, forensic issues related to fraud, and psychopathology.

**Frank S. Perri** is employed as a criminal trial attorney with concentrations in white-collar crimes and homicide. He received his juris doctor from the University of Illinois, a master in business administration from Case Western Reserve University and Bachelor of Arts from Union College. In addition, he is a certified public accountant and certified fraud examiner. His research interests include Fraud Detection Homicide and the behavioral profiling of white-collar criminals. Mr. Perri can be contacted at: [frankperri@hotmail.com](mailto:frankperri@hotmail.com).

## ACKNOWLEDGEMENT

The authors are indebted to Ed Peaco for his editorial assistance.

---

<sup>1</sup> Ted Poe, "Colombian Drug Cartels Using Submarines to Bring Cocaine into the United States," Statement to United States House of Representatives, May 5, 2011.

<sup>2</sup> "Las FARC trabajan para los narcotraficantes mexicanos" (The FARC Works for Mexican Drug Traffickers), infobaie.com, September 13, 2010, <http://america.infobae.com/notas/9047-Las-FARC-trabajan-para-los-narcotraficantes-mexicanos>.

<sup>3</sup> United States Southern Command, "SouthCom Commander Testifies Before Congress," Testimony of Mass Communications Specialist 1<sup>st</sup> Class Michael Wimbish Before Congress, March 14, 2008, <http://www.southcom.mil/appssc/news.php?story=1007>; James G. Stavridis, "The Terrorism Threat," *Partnership for the Americas Western Hemisphere Strategy and U.S. Southern Command* (Washington, D.C.: National Defense University Press, 2010).

<sup>4</sup> Diane M. Ramsey and Mark S. Boerner, "A Study in Indications Methodology," *Center for Study of Intelligence* (Washington DC: Central Intelligence Agency, 2008), [https://www.cia.gov/library/center-for-the-study-of-intelligence/kent-csi/vol7no3/html/v07i3a08p\\_0001.htm](https://www.cia.gov/library/center-for-the-study-of-intelligence/kent-csi/vol7no3/html/v07i3a08p_0001.htm).

<sup>5</sup> David Kushner, "Drug-Sub Culture," *New York Times Magazine*, April 23, 2009; "Mumbai Terrorists were Trained to Become Mariners to Use Sea Route," December 1, 2008, <http://www.marinebuzz.com/2008/12/01/mumbai-terrorists-were-trained-to-become-mariners-to-use-sea-route/>.

<sup>6</sup> Dana Dillon, "Maritime Piracy: Defining the Problem," *SAIS Review* 25 (2005): 155-164.

<sup>7</sup> Scott Swanson, "Threat Assessment: LTTE Sea Tigers in the Strait of Malacca," *Delphi International Research, LLC*, [http://www.delphiresearch.us/files/StraightofMalacca\\_SeaTigerThreatv3.pdf](http://www.delphiresearch.us/files/StraightofMalacca_SeaTigerThreatv3.pdf)

<sup>8</sup> Frank S. Perri, Terrance G. Lichtenwald, and Paula M. MacKenzie, "Evil Twins: The Crime Terror Nexus," *Forensic Examiner* 18, no. 4 (2009): 16-29; Terrance G. Lichtenwald and Frank S. Perri, "Smuggling Tunnels: the Need for a Transnational Analysis," *Inside Homeland Security* 9, no.1 (2011): 52-69. See National Criminal Justice Reference #NCJ234281.

<sup>9</sup> Ibid.

<sup>10</sup> Perri, Lichtenwald, and MacKenzie, "Evil Twins."

<sup>11</sup> Lichtenwald and Perri, "Smuggling Tunnels."

<sup>12</sup> Kirk Semple, "The Submarine Next Door," *New York Times Magazine*, December 03, 2000.

<sup>13</sup> *A Cooperative Strategy for 21st Century Seapower*. (Presented by the U.S. Chief of Naval Operations and the Commandants of the U.S. Marine Corps and U.S. Coast Guard at the International Seapower Symposium on October 17, 2007), <http://www.navy.mil/maritime/Maritimestrategy.pdf>

<sup>14</sup> Dillon, "Maritime Piracy"; Moises Naim, "The Drug Trade: the Politicization of Criminals and the Criminalization of Politicians," Working Paper Prepared for the First Meeting of the Commission Geneva, January 24-25, 2011 (Washington, D.C.: Carnegie Endowment for International Peace), [http://www.globalcommissiondrugs.org/Archivos/Global\\_Com\\_Moises\\_Naim.pdf](http://www.globalcommissiondrugs.org/Archivos/Global_Com_Moises_Naim.pdf).

<sup>15</sup> "Colombia ha incautado 16 'submarinos' de los narcos en 3 años" (Colombia has Captured Sixteen Semi-Submersible Submarines in the Past 3 Years), April 5, 2011, <http://www.lapatilla.com/site/2011/04/05/colombia-ha-incautado-16-submarinos-de-los-narcos-en-3-anos/>

<sup>16</sup> "Latest Threat Facing America: Narco Subs," December 01, 2009, [http://www.ar15.com/forums/t\\_1\\_5/967920\\_The\\_latest\\_threat\\_facing\\_America\\_Narco\\_Subs.html](http://www.ar15.com/forums/t_1_5/967920_The_latest_threat_facing_America_Narco_Subs.html)

- <sup>17</sup> Terrance G. Lichtenwald, "Drug Smuggling Behavior: A Developmental Smuggling Model," *Forensic Examiner* 12, Part 1 (November/December 2003): 15-22. See National Criminal Justice Reference Service #NCJ209084; Terence G. Lichtenwald, "Drug Smuggling," *Forensic Examiner* 13, Part 2 (Spring 2004): 14-23. See National Criminal Justice Reference Service #209085.
- <sup>18</sup> Semple, "The Submarine Next Door."
- <sup>19</sup> "The Wolfpacks, What is a Wolfpack?" <http://www.uboot.net/ops/wolfpacks/overview.htm>
- <sup>20</sup> Kushner, "Drug-Sub Culture."
- <sup>21</sup> Sudha Ramachandran, "The Sea Tigers of Tamil Eelam," *Asia Time Online*, August 31, 2006, <http://www.atimes.com>
- <sup>22</sup> Ibid.
- <sup>23</sup> "Narco Submarines, Torpedoes, and Semi-Submersibles," *Covert Shores Naval Warfare Blog*, June 24, 2010, <http://covertshores.blogspot.com/2010/06/narco-submarines-torpedoes-and-semi.html>
- <sup>24</sup> Ibid.
- <sup>25</sup> Damien Cave, "Monster Trucks on the Road, From Gangs in Mexico," *NYTimes.com*, June 7, 2011, <http://www.nytimes.com/2011/06/08/world/americas/08mexico.html>.
- <sup>26</sup> David Farah, "Russian Mob, Drug Cartels Joining Forces," *Washingtonpost.com*, September 29, 1997.
- <sup>27</sup> "Submarine Proliferation Russia Export Behavior," January 2010, [www.nti.org/db/submarines/russia/export](http://www.nti.org/db/submarines/russia/export); "Venezuela Acquiring Russian Submarines," UPI.com, August 10, 2010, [http://www.upi.com/Business\\_News/Security-Industry/2010/08/10/Venezuela-acquiring-Russian-submarines/UPI-75881281471976/print/#ixzz1T81Ac8ko](http://www.upi.com/Business_News/Security-Industry/2010/08/10/Venezuela-acquiring-Russian-submarines/UPI-75881281471976/print/#ixzz1T81Ac8ko).
- <sup>28</sup> Russell Working and Nonna Cherryakova, "Stripped for Cash: Impoverished Russian Sailors Stealing Submarine Parts," *Chronicle Foreign Service*, June 25, 2001, [http://www.articles.sfgate.com/2001-06-25/news/17603658\\_1-radioactive-isotopes-submarine-crime-rate/](http://www.articles.sfgate.com/2001-06-25/news/17603658_1-radioactive-isotopes-submarine-crime-rate/)
- <sup>29</sup> "Submarine Proliferation Russia Export Behavior."
- <sup>30</sup> Shin Joo Hynn, "North Korean Submarine Helmsman Breaks 14-Year Silence," *Daily NK*, June 1, 2010.
- <sup>31</sup> "Non-traditional Challenges: A Perspective from U.S. Southern Command," *The Center for Strategic and International Studies* (Military Strategy Forum with General Douglas M. Fraser, Commander, U.S. Southern Command, July 29, 2010); Maria Cvetanoski, "Colombian Captain NEMO Captured submarine with 1.6 Tons of Cocaine," *Politics the War* 06 (2008): 16; "Submarines: Drug Gangs Build a Real One," *Strategy Page Online*, July 6, 2010, <http://www.strategypage.com/htm/htsub/20100706.aspx>
- <sup>32</sup> Cvetanoski, "Colombian Captain NEMO Captured Submarine."
- <sup>33</sup> "Finding the Brains behind the Cocaine Boats," *StrategyPage Online*, May 04, 2011, <http://www.strategypage.com/htm/htsub/20110504.aspx>
- <sup>34</sup> "Los narcos hispanoamericanos distribuyen droga por todo el mundo hasta con el uso de submarines," *RealidadEnSudamerica*, January 7, 2011, [http://www.youtube.com/watch?v=\\_ioZllCD5Tw](http://www.youtube.com/watch?v=_ioZllCD5Tw); Esperanza Calvo, "Narcosubmarinos: La guerra contra el narcotráfico se submerge," *Informativostelecinco- Reporteros Online*, December 21, 2010, <http://www.telecinco.es/informativos/reporteros/noticia/100031725/Narcosubmarinos+La+guerra+contra+el+narcotrafico+se+sumerge>.
- <sup>35</sup> Lichtenwald and Perri, "Smuggling Tunnels"; Terrance G. Lichtenwald, Frank S. Perri, and Paula MacKenzie, "Smuggling Multi-Consignment Contraband: Isolated Incidents or a New Trend," *Inside Homeland Security* 7, no. 2 (2009): 17-31.

- <sup>36</sup> Walter Jayawardhana, "LTTE Prime Suspects in Transporting 3 tons of cocaine in Submarine," *Ministry of Defense*, December 30, 2010, [http://www.defence.lk/new.asp?fname+20061206\\_03](http://www.defence.lk/new.asp?fname+20061206_03); Hannah Stone, "Honduras Catches First Narco-Sub," July 15, 2011, <http://www.insightcrime.org/insight-latest-news/item/1237-honduras-catches-first-narco-sub>.
- <sup>37</sup> Ramsey and Boerner, "A Study in Indications Methodology"; Chris Kraul, "Drug Traffickers Dive in Submersibles Are Used to Ferry Narcotics. Some Fear the Tactic May Inspire Terrorists," *Los Angeles Times*, November 6, 2007; Alexander Buhler, "Former Drug Smuggler Tells His Story," *Spiegel Online*, December 2, 2010.
- <sup>38</sup> Cvetanoski, "Colombian Captain NEMO Captured Submarine."
- <sup>39</sup> Kushner, "Drug-Sub Culture."
- <sup>40</sup> Nils Elzenga, "Latin American Drug Traffickers May Use Submarines to Move Drugs Across the Atlantic," *HuffintonPost.com*, June 20, 2011, [http://www.huffingtonpost.com/2011/06/20/latin-american-cocaine-traffickers-submarines-atlantic-\\_n\\_880861.html](http://www.huffingtonpost.com/2011/06/20/latin-american-cocaine-traffickers-submarines-atlantic-_n_880861.html).
- <sup>41</sup> "DEA Intel Aids in Seizure of Fully – Operational Narco Submarine in Ecuador," news release from DEA Public Affairs, no.202-302-7977, July 03, 2010, <http://www.justice.gov/dea/pubs/pressrel/pro70310p.html>.
- <sup>42</sup> "FARC Have Drug Trafficking Networks in Brazil," May 20, 2010, [http://dgtpowerdemo.dgtmedia.com/flarenetwork/learn/central\\_and\\_south\\_america/article/farc\\_have\\_drug\\_trafficking\\_networks\\_in\\_brazil.htm](http://dgtpowerdemo.dgtmedia.com/flarenetwork/learn/central_and_south_america/article/farc_have_drug_trafficking_networks_in_brazil.htm)
- <sup>43</sup> "Submarines: Drug Gangs Build a Real One."
- <sup>44</sup> "Finding the Brains Behind the Cocaine Boats."
- <sup>45</sup> "Spanish Police Seize Suspected Drug Sub," *The Sydney Morning Herald*, August 15, 2006, <http://www.smh.com.au/news/World/Spanish-police-seize-suspected-drug-sub/2006/08/14/1155407741662.html>; "Spanish Police Find 'Drugs' Sub," *BBC News Online*, August 14, 2006, <http://news.bbc.co.uk/2/hi/europe/4792075.stm>
- <sup>46</sup> "Narco Submarines, Torpedoes, and Semi-Submersibles."
- <sup>47</sup> "...From the Sea: Preparing the Naval Service for the 21<sup>st</sup> Century" (Washington, DC: Department of the Navy, September 1992), <http://www.au.af.mil/au/awc/awcgate/navy/fromsea/fromsea.txt>; *Forward...From the Sea* (Washington, DC: Department of the Navy, 1995), <http://www.dtic.mil/jv2010/navy/b014.pdf>.
- <sup>48</sup> Perri, Lichtenwald, and MacKenzie, "Evil Twins."
- <sup>49</sup> Farah, "Russian Mob, Drug Cartels Joining Forces."
- <sup>50</sup> Mark Mazzetti and Thom Shanker, "Russian Subs Patrolling Off East Coast of U.S.," *The New York Times*, August 5, 2009, <http://nytimes.com/2009/08/05/world/05patrol.html>.
- <sup>51</sup> Elaine Silvestrini, "Sub Crews Getting that Sinking Feeling," *Tampa Tribune*, October 2, 2009, <http://www2.tbo.com/news/metro/2009/may/12/na-sub-crews-getting-that-sinking-feeling-ar-89963>; "Robot Submarines Go to War – Part 2 the Navy's AUV's," *Popsci*, January 01, 2008, <http://www.popsci.com/scitech/article/2003-03/robot-submarines-go-war-part-2-navys-auvs>.
- <sup>52</sup> Ramachandran, "The Sea Tigers of Tamil Eelam."
- <sup>53</sup> "Security Against Terrorism on U.S. Military Bases," Statement of Captain Joseph F. Bouchard, USN, commanding Officer, NS Norfolk to the Special Oversight Panel on Terrorism of the House Armed Services Committee 107 Congress, June 28, 2001, [http://commdocs.house.gov/committees/security/has179240.000/has179240\\_of.htm](http://commdocs.house.gov/committees/security/has179240.000/has179240_of.htm)
- <sup>54</sup> Shafika Mattar, "U.S. Ship Attacked in Jordan Port, Rockets Miss Mark; No Sailors Injured," *WashingtonPost.com*, August 20, 2005, [http://washingtonpost.com/wpdyn/content/article/2005/08/19/AR2005081900287\\_pf.html](http://washingtonpost.com/wpdyn/content/article/2005/08/19/AR2005081900287_pf.html)
- <sup>55</sup> Bruce E. Bechtol, "The Implications of the Cheonan Sinking: A Security Studies Perspective," *International Journal of Korean Unification Studies* 19, No. 2 (2010): 1-40.

- <sup>56</sup> Joe Pappalardo, "Is the U.S. Prepared to Face Midget Subs?" Foxnews.com, May 27, 2010. See <http://www.foxnews.com/scitech/2010/05/27/navy-korea-midget-sub>
- <sup>57</sup> Lee Hyo-Sik, "Submarine Detoured in West Sea," *The Silent Sentinel* (June 2010) [http://www.ussv.usandiego.org/Sentinels/SS\\_06\\_2010.pdf](http://www.ussv.usandiego.org/Sentinels/SS_06_2010.pdf)
- <sup>58</sup> "Little Subs for Commandos," *StrategyPage*, July 10, 2007, <http://www.strategypage.com/htmw/htsf/20070710.aspx>
- <sup>59</sup> Mohammed M. Hafex and Joseph M. Hatfield, "Do Targeted Assassinations Work? A Multivariate Analysis of Israeli Counter-Terrorism Effectiveness during Al-Aqsa Uprising," (Paper prepared for United States Institute of Peace, Kansas City, Missouri: University of Missouri Department of Political Science, 2006), <http://www-personal.umich.edu/~satran/PoliSci%2006/Wk%2012-1%20Hamaz%20Hafez.pdf>; Aaron Mannes, "Testing the Snake Head Strategy: Does Killing or Capturing its Leaders Reduce a Terrorist Group's Activity," *The Journal of International Policy Solutions* 9 (Spring 2008): 40-49, <http://irps.ucsd.edu/assets/017/7167.pdf>
- <sup>60</sup> Perri, Lichtenwald, and MacKenzie, "Evil Twins."
- <sup>61</sup> Christopher D. Webster, Kevin S. Douglas, Derek Eaves, and Stephen D. Hart, *HCR-20 Assessing Risk for Violence - Version 2* (British Columbia, Canada: Mental Health, Law, and Policy Institute - Simon Fraser University, 1997); Kevin S. Douglas, Christopher D. Webster, Stephen C. Hart, Derek Eaves, and James R.P. Ogloff, *HCR-20 Violence Risk Management Companion Guide* (British Columbia, Canada: Mental Health, Law, and Policy Institute - Simon Fraser University, 2001).
- <sup>62</sup> United States Coast Guard, *Intelligence* (Washington, DC: U.S. Coast Guard Publication 2-0, May 2010).



Copyright © 2012 by the author(s). *Homeland Security Affairs* is an academic journal available free of charge to individuals and institutions. Because the purpose of this publication is the widest possible dissemination of knowledge, copies of this journal and the articles contained herein may be printed or downloaded and redistributed for personal, research or educational purposes free of charge and without permission. Any commercial use of *Homeland Security Affairs* or the articles published herein is expressly prohibited without the written consent of the copyright holder. The copyright of all articles published in *Homeland Security Affairs* rests with the author(s) of the article. *Homeland Security Affairs* is the online journal of the Naval Postgraduate School Center for Homeland Defense and Security (CHDS).

<http://www.hsaj.org>

