



The **COAST GUARD** Journal of Safety
& Security at Sea

PROCEEDINGS

of the Marine Safety & Security Council

Fall 2014

The USCG Western Hemisphere Strategy

*Combating
networks*

*Securing
borders*

*Safeguarding
commerce*





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Deputy Commandant's Perspective

by VICE ADMIRAL CHARLES D. MICHEL
*U.S. Coast Guard
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I am honored and pleased to serve as the Flag sponsor for the Western Hemisphere Strategy issue of Coast Guard *Proceedings*. During the past year, the Coast Guard has engaged an exceptional array of partners and stakeholders to develop a first-of-its-kind regional Coast Guard strategy for the Western Hemisphere. Much like the Coast Guard Arctic Strategy, released in 2013, the Western Hemisphere Strategy takes a regionally focused look at specific challenges for our nation and our partners and allies and proposes clear strategic priorities to guide our service's efforts in the coming decade.

Our nation has always recognized and prioritized the security and stability of the Western Hemisphere, a region characterized by dramatic human progress and increasing prosperity, as well as by ever-evolving threats that pose significant risks to hemispheric security. As global demands strain national security and defense resources, the Coast Guard will assume an even more critical role in safeguarding our interests in areas closer to our shores.

I have witnessed firsthand the nature of the challenges associated with this dynamic environment as a cutterman serving on major cutters and patrol boats in the Atlantic Ocean and Caribbean Sea, as the Director of Joint Interagency Task Force South, and most recently as the Deputy Commander of Coast Guard Atlantic Area. The rise and convergence of transnational organized crime and terrorists; alarming trends in illicit maritime, communication, and intelligence capabilities; globalization; cyber threats; and the rising economic and human impact of natural disasters represent some of our greatest challenges in the years ahead.

The Western Hemisphere Strategy emphasizes agile knowledge and risk-based response and adaptation to the threats and challenges that pose the greatest risks to maritime security and, by extension, our national prosperity. It establishes three innovative strategic priorities for the Coast Guard in the next 10 years—combating networks, securing borders, and safeguarding commerce. Recognizing the enduring nature of the task ahead, the strategy also outlines numerous critical enabling factors essential to our shared success. Many of these enabling factors place a strong emphasis on unity of effort and building partnerships across public and private sectors, states, agencies, and nations.

The Western Hemisphere has always been—and will remain—the primary operating area for the U.S. Coast Guard. It is where the Coast Guard expends the vast majority of its efforts and resources to ensure the safety, security, and stewardship of our nation's waters. As we progress into a new century of opportunity in this vibrant region, we will remain always ready to meet and overcome both the persistent and emerging challenges that lie ahead.

Champion's Point of View



by CDR JAMES MORAN
U.S. Coast Guard
Emerging Policy Staff

In recent decades, it seems that our national security focus has been dominated by concerns in the Eastern Hemisphere. Even as we attempt to extricate ourselves from the military engagements of the post-9/11 era, we still find much of our public, private, and national dialog focused on rising Eastern powers or engagements with destabilized countries that pose terrorist threats.

Although the Coast Guard is active across the globe, our primary mission space has always been in the Western Hemisphere. The Coast Guard Western Hemisphere Strategy details the importance of safety and security in waters closer to our shores by highlighting the importance of regional safety and security that promotes our nation's—and region's—prosperity. Amid the overriding trends and significant hemispheric challenges our nation will face in the coming years, the Western Hemisphere Strategy provides a clear framework to address the most pressing risks the Coast Guard will confront within our primary operating region during the next 10 years.

As an author and project lead for this strategy, it was a great pleasure to work closely with a wide array of dedicated professionals, academia, and security experts who helped make this unprecedented Coast Guard Strategy possible. Many of these same people have also provided insightful commentary for this issue of *Proceedings*. The authors who submitted articles for this edition are a true testament to the interest the Coast Guard's Western Hemisphere Strategy has garnered in the past year.

Among the usual cast of dedicated Coast Guard military and civilian authors, this issue of *Proceedings* features an internationally recognized author on transnational organized crime, Mr. Douglas Farah, as well as officials from a wide variety of partner agencies and commands, including the Department of State, the U.S. Maritime Administration, the Department of Defense, and the Joint Interagency Task Force South.

The topics presented in this edition mirror the organizational structure of the Western Hemisphere Strategy itself, which presents three strategic priorities—combating networks, securing borders, and safeguarding commerce—along with a section on critical enabling factors that will ensure our long-term success in the region. I hope you find this edition interesting and informative.

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Threat Convergence

When enemies unite.

by MR. DOUGLAS FARAH
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In recent years, the concept of threat convergence from transnational organized crime (TOC) networks to terrorist groups—into new and more dangerous hybrid threats to U.S. national security—has gained currency in law enforcement, academic, and intelligence communities.

One of the primary zones of convergence for the TOC and terrorist nexus is Latin America, and of particular concern are the seven countries of Central America. In Central America, El Salvador, Guatemala, and Honduras are at the center of the regional convergence phenomenon.

This emerging threat combination comprises a hybrid of

criminal/terrorist, and state/non-state franchises, combining multiple nations acting in concert and traditional transnational organized crime networks and terrorist groups acting as proxies for the nation-states that sponsor them. Today, the United States should view these hybrid franchises as a tier-one security threat.

Understanding and mitigating transnational organized crime threats require a whole-of-government approach, including collection, analysis, law enforcement, policy, and programming. No longer is the state/non-state dichotomy viable in tackling these problems, just as the TOC/terrorism divide is increasingly disappearing.



Recognizing TOC Threats

In 2011, President Obama released the Strategy to Combat Transnational Organized Crime, recognizing the reality that TOC networks “are proliferating, striking new and powerful alliances, and engaging in a range of illicit activities as never before. The result is a convergence of threats

that have evolved to become more complex, volatile, and destabilizing.”¹

Moreover, in 2013, the book *Convergence: Illicit Networks and National Security in the Age of Globalization*,² received widespread attention, arguing that threat networks are forming new, lethal alliances—some temporary and some

of longer duration—that pose a new level of threat to state sovereignty, undermine the rule of law, threaten democratic governance, and are a clear and present danger to the United States and other nations.

Today, transnational organized crime threats include not only traditional activities, such as drug and human trafficking, but others, including the potential for weapons of mass destruction (WMD)-related trafficking. Moreover, regional and extra-regional state actors, along with leaders deeply enmeshed in crime, carry out these activities. These same leaders have a publicly articulated doctrine of asymmetrical warfare against the United States and its allies that explicitly endorses as legitimate the use of WMD.

An Alliance Made Out of Hatred

The self-described Bolivarian states seeking to establish 21st century socialism are at the vanguard of the hybrid movement bringing together TOC groups, terrorist organizations, and criminalized states. The group takes its name from Simón Bolívar, who liberated much of South America from Spanish rule.

This bloc of nations, led initially by the late Hugo Chávez of Venezuela (includes Chávez’s successor Nicolás Maduro, Rafael Correa of Ecuador, Evo Morales of Bolivia, Desi Bouterse of Suriname, and Daniel Ortega of Nicaragua), seeks to break the traditional ties of the region to the United States. To this end, the Bolivarian alliance has formed numerous organizations and military alliances, which explicitly exclude the United States, including a military academy in Bolivia, to erase the vestiges of U.S. military training.³

The only things the Bolivarian nations and the reactionary theocratic regime in Iran have in common is a stated hatred for the United States, and the desire to inflict damage on the nation they view as the “Evil Empire,” or the “Great Satan.” This is a new type of alliance of secular (self-proclaimed socialist and Marxist) and radical Islamist organizations with a common goal directly aimed at challenging and undermining the security of the United States and its primary allies in the region (Colombia, Chile, Peru, Panama, and Guatemala).

These hybrid franchises operate in and control specific geographic territories that, in turn, allow them to function in a relatively safe environment. These pipelines, or recombinant chains of networks, are highly adaptive and able to move humans and a multiplicity of illicit products (cocaine, weapons, and bulk cash) that ultimately cross U.S. borders undetected, thousands of times each day.

The actors along the pipeline form and dissolve alliances quickly, occupy both physical and cyberspace, and use



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highly developed, modern institutions, including the global financial system, as well as ancient smuggling routes and methods.

Transnational Organized Crime is Profitable

The profits of global TOC activities are enormous, even before factoring in the growing efficiencies derived from state sponsorship and protection. The sheer scale of the enterprise and the impact it has on legal economies, argues for sustained national and international attention and resources as a tier-one security threat. These new factors further increase the threat.

The most recent comprehensive studies of global criminal proceeds demonstrate the magnitude of the challenge. The White House estimates in its 2011 Transnational Organized Crime Strategy that money laundering accounts for \$1.3 to \$3.3 trillion, or between 2 to 5 percent of world gross domestic product (GDP).

Bribery from transnational organized crime networks adds close to \$1 trillion to that amount, while drug trafficking generates an estimated \$750 billion to \$1 trillion, counterfeited and pirated goods add another \$500 billion, and illicit firearms sales generate from \$170 to \$320 billion. This totals to potentially \$6.2 trillion—fully 10 percent of world GDP, placing it behind only the U.S. and E.U., but well ahead of China, in terms of global GDP ranking.⁴ Other global criminal proceeds estimates range from a low of about 4 percent to a high of 15 percent of global GDP.⁵

As noted in my study, *Central America’s Northern Triangle: A Time of Turmoil and Transition*,⁶ little of what is occurring in Central America and elsewhere is new. Even the presence of Russian TOC networks selling weapons dates back more than a decade. What is new is the growing power and the state penetration of these groups, both in terms of political power and territory control.





U.S. Coast Guard crewmembers examine a self-propelled semi-submersible, captured off the coast of Central America. U.S. Coast Guard photo.

The Rise of TOC Networks

Instead of operating on the periphery of the state, elements of the new convergence are operating ever closer to the centers of power, acquiring financial resources that rival or outstrip those of the state, and are becoming institutionalized across the region. These groups control private security forces that often out-gun the national law enforcement forces, control intelligence structures that are far superior to those of the state, control vast amounts of territory where the TOC groups effectively are the state, and have political power through almost every institution and political party in the region.

Rather than the acts themselves being new, it is the volume, sophistication, power, and impunity of the illicit activities and actors that is fundamentally reshaping much of Latin America. This is due to the significant and growing criminalization (varying from country to country) of the Central American nations.⁷ This has led to the collapse of the state as a guarantor of an impartial and functioning judicial system, the rule of law, border control, and to a political process that represents little other than the investments of different TOC groups in securing their interests.

Most of the goods and services that generate this wealth pass through geographic regions often described as “stateless” or “lawless.” However, these regions are far from ungoverned; in fact, they represent a powerful component of the threat from transnational organized crime networks, terrorist groups, and other non-state actors, which control them, either at the expense of weak host states and their neighbors, or in alliance with stronger ones that host them, tolerate them, or use them as statecraft instruments.

Significant TOC organizations — principally drug trafficking groups — have posed serious challenges for U.S. security since the rise of the Medellín cartel in the early 1980s, and the growth of the Mexican drug trafficking organizations in the 1990s.

There has also been, for the past two decades, an overlap and interaction of Latin American TOC groups across multiple continents, mostly on a relatively small scale and largely confined to the exchange of goods (cocaine for heroin) and services (money laundering, weapons, and safe havens). In recent years, these many emergent relationships

have grown to include the support of terrorist organizations as well. For example, in the particular cases of Latin America and West Africa, there have been documented cases of illicit weapons purchases and transfers to non-state armed actors.⁸ Other cases, such as ties of the Colombian drug trafficking organizations to Australian weapons traffickers have been identified, but not fully examined, and presumably many others have yet to come to the attention of authorities.

Moreover, governments have become more aware of the increased flow of South American cocaine through Venezuela to West Africa—particularly through Mali, Guinea Bissau, and other fragile states. This is possibly benefitting not only the traditional regional transnational organized crime structures and their Colombian and Mexican allies, but several terrorist entities, including Al Qaeda in the Islamic Maghreb, Hezbollah,⁹ and the Revolutionary Armed Forces of Colombia.¹⁰

In addition to shifting routes, several other states that traditionally have had little interest or influence in Latin America have emerged during the past decade, primarily at the invitation of and with support from the Bolivarian bloc.

Iran, identified by successive U.S. administrations as a state sponsor of terrorism, has expanded its political alliances, diplomatic presence, trade initiatives, and military and intelligence programs in the Bolivarian axis. The U.S. intelligence community has recently assessed that Iranian leadership is now more willing to launch a terrorist attack inside our homeland in response to perceived threats from the United States.¹¹

This press for expanded Iranian ties in the Bolivarian states comes despite the almost complete lack of cultural or religious ties to the region, linguistic affinity, or traditional economic logic and rationale in the relationships.

Russia is a growing force, particularly in Mexico and the Bolivarian states, where it is building up a regional presence through rapidly rising weapons sales, naval and air force visits, increasing diplomatic presence, and nuclear cooperation agreements with Venezuela, Bolivia, and Ecuador. In addition to the growing presence of a state itself, which is increasingly viewed as criminalized, there has been a significant increase in the presence of Russian non-state actors in the form of TOC networks, which are widely involved in drug trafficking, weapons smuggling, and money laundering activities.¹²

Foreign Involvement with TOC Groups

China is aggressively and successfully moving in to acquire access to many of the region's natural resources, and trade between Latin America and China is growing exponentially. During the past decade, China's trade with Latin America has jumped from \$10 billion to \$179 billion.¹³

With the increased presence has come a significantly enhanced Chinese intelligence capacity and access across Latin America. At the same time, Chinese triads (Chinese transnational organized crime organizations) are now operating extensive money-laundering services for drug trafficking organizations via Chinese banks.

China also has shown a distinct willingness to bail out financially strapped authoritarian governments if the price is right. For example, China loaned Venezuela \$20 billion, in the form of a joint venture with a company, to pump crude that China then locked up for a decade at an average price of about \$18 a barrel. The money came as Chávez was facing a financial crisis, rolling blackouts, and a severe liquidity shortage across the economy.¹⁴ Since then, China has extended several other significant loans to Venezuela, Ecuador, and Bolivia.

The dynamics of the relationship between China and the Bolivarian bloc and its non-state proxies will be one of the key determinants of the future of Latin America and the survival of the Bolivarian project. Without significant material support from China, the economic model of the Bolivarian alliance will likely collapse under its own weight of statist inefficiency and massive corruption, despite being richly endowed with natural resources.

However, Chinese leaders likely understand that any real replacement of the Bolivarian structure leadership by truly democratic forces could result in a significant loss of access

to the region and cancellation of existing contracts. This, in turn, gives China incentive to continue to support some form of the Bolivarian project going forward, even if leaders such as Chávez and Fidel Castro are no longer on the scene.

Other even less well-known groups are appearing in the region. For example, Nigerian transnational organized crime groups have been particularly active in Ecuador, where they drew police attention because of the unusual violence of the group, including instances of beheading competitors.¹⁵

These developments indicate that multiple groups—terrorist and criminal—as well as some extra-regional states are expanding their relationships in breadth and scope, demonstrating the Latin America case is far from unique.

While there have been criminalized states in the past (the García Meza regime of “cocaine colonels” in Bolivia in 1980, and Desi Bouterse in Suriname in the 1980s, for example), what is new with the Bolivarian structure is the simultaneous and mutually supporting merging of state with TOC activities across multiple state and non-state platforms.

García Meza, Bouterse, and others were generally treated as international pariahs with no little outside support. In contrast, the new criminalized states offer each other economic, diplomatic, political, and military support that shields them from international isolation and allows for mutually reinforcing structures.

This conceptualization of the criminalized state builds on a hybrid model that describes the relationship among terrorist groups and TOC networks,¹⁶ adding the element of the criminalized state appropriating and sometimes merging with those hybrid groups, such as the Revolutionary Armed Forces of Colombia. There is a shared overarching political vision that justifies the state support of transnational organized crime as another tool in the toolbox of 21st century revolutionaries.

Of particular concern is the relationship of these Bolivarian states supporting non-state actors in the hemisphere, with Iran, a state that has for many years funded, trained, and protected Hezbollah—one of the most effective and efficient non-state (or quasi-state) terrorist actors in the world. The growing presence of Hezbollah in the Latin American drug trade—both directly and through its proxies in West Africa and Southern Eurasia—presents a new and important threat to U.S. security.

Moving Forward

Given this reality, it is imperative that the U.S. intelligence community, military, and law enforcement agencies develop a much deeper and more nuanced understanding of how the



criminalized state/TOC/terrorist groups and foreign hostile state and non-state foreign actors exploit the ungoverned or stateless areas in an areas of close proximity to U.S. borders—and the dangers they represent both in their current configuration and future iterations.

Understanding how these groups develop and how they relate to each other and to groups from outside the region is vital—particularly given the rapid pace with which they are expanding their control across the continent, across the hemisphere, and beyond. Developing a predictive capacity must be based on a more realistic understanding of the shifting networks of actors exploiting the pipelines, the nature and location of the geographic space in which they operate, the critical nodes where these groups are most vulnerable, and their behaviors in adapting to new political and economic developments, market opportunities, setbacks, internal competition, and the countering actions of governments.

In turn, an effective strategy for combating transnational organized crime must rest on a solid foundation of regional intelligence, which, while cognizant of the overarching transnational connections, remains sensitive to unique local realities behind seemingly ubiquitous behavior. A one-size-fits-all policy will not suffice. It is not a problem that is only or primarily a matter of state or regional security, narcotics, money laundering, terrorism, human smuggling, weakening governance, democracy reversal, trade and energy, counterfeiting and contraband, immigration and refugees, hostile states seeking advantage, or alterations in the military balance and alliances.

It is increasingly a combination of all of these. It is a comprehensive threat that requires analysis and management within a comprehensive, integrated whole-of-government approach. At the same time, however expansive in global terms, a strategy based on geopolitics—the fundamental understanding of how human behavior relates to geographic space—must always be rooted in the local.

About the author:

Mr. Douglas Farah is the president of IBI Consultants LLC and senior associate, Americas Program, CSIS.

Endnotes:

- ¹ *Strategy to Combat Transnational Organized Crime: Addressing Converging Threats to National Security*. National Security Council; the White House, July 2011. Available at www.whitehouse.gov/sites/default/files/microsites/2011-strategy-combat-transnational-organized-crime.pdf.
- ² *Convergence: Illicit Networks and National Security in the Age of Globalization*. Michael Miklaucic and Jacqueline Brewer, editors, NDU Press, Washington, D.C., 2013. The author contributed a chapter to the book.
- ³ These include recently founded Community of Latin American and Caribbean States (*Comunidad de Estados Latinoamericanos y Caribeños-CELAC*), and the Bolivarian Alliance for the Peoples of Our America (*Alianza Bolivariana para los Pueblos de Nuestra América-ALBA*).
- ⁴ *Fact Sheet: Strategy to Combat Transnational Organized Crime*. Office of the Press Secretary; the White House, July 25, 2011.
- ⁵ On the lower end, the United Nations Office of Drugs and Crime estimate TOC earnings for 2009 at \$2.1 trillion, or 3.6 percent of global GDP. Of that, typical TOC activities such as drug trafficking, counterfeiting, human trafficking, weapons trafficking and oil smuggling, account for about \$1 trillion or 1.5 percent of global GDP. For details see *Estimating Illicit Financial Flows Resulting from Drug Trafficking and other Transnational Organized Crimes*. United Nations Office of Drugs and Crime, September 2011. On the higher end, in a speech to Interpol in Singapore, 2009, U.S. Deputy Attorney General Ogden cited 15% of world GDP as total annual turnover of transnational organized crime. See: Josh Meyer's *U.S. attorney general calls for global effort to fight organized crime*. Los Angeles Times, October 13, 2009. Available at: <http://articles.latimes.com/print/2009/oct/13/nation/na-crime13>.
- ⁶ *Central America's Northern Triangle: A Time of Turmoil and Transition*. IBI Consultants, April 2013. Available at: www.ibiconsultants.net/_pdf/turmoil-and-transition-2.pdf.
- ⁷ For a broader definition and look at how "criminalized states" in Latin America operate, see Douglas Farah's *Transnational Organized Crime, Terrorism and Criminalized States: An Emerging Tier-One Security Priority*, U.S. Army War College, Strategic Studies Institute, August 2012.
- ⁸ One of the most detailed cases involved the 2001 weapons transfers among Hezbollah operatives in Liberia, a retired Israeli officer in Panama and a Russian weapons merchant in Guatemala. A portion of the weapons, mostly AK-47 assault rifles ended up with the United Self Defense Forces of Colombia (*Autodefensas Unidas de Colombia-AUC*), a designated terrorist organization heavily involved in cocaine trafficking. The rest of the weapons, including anti-tank systems and anti-aircraft weapons likely ended up with Hezbollah. For details, see Douglas Farah's *Blood From Stones: The Secret Financial Network of Terror*. Broadway Books, New York, 2004.
- ⁹ For a detailed look at this development see Antonio L. Mazzitelli's *The New Transatlantic Bonanza: Cocaine on Highway 10*. Western Hemisphere Security Analysis Center, Florida International University, March 2011.
- ¹⁰ The FARC is the oldest insurgency in the Western hemisphere, launched in 1964 out of Colombia's Liberal Party militias and enduring to the present as a self-described Marxist revolutionary movement. For a more detailed look at the history of the FARC see Douglas Farah's *The FARC in Transition: The Fatal Weakening of the Western Hemisphere's Oldest Guerrilla Movement*. NEFA Foundation, July 2, 2008. Available at: www.nefafoundation.org/miscellaneous/nefafarc0708.pdf.
- ¹¹ Clapper, J., Director of National Intelligence. *Unclassified Statement for the Record: Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence*, January 31, 2012, p. 6.
- ¹² For the most comprehensive look at Russian Organized Crime in Latin America, see Bruce Bagley's *Globalization, Ungoverned Spaces and Transnational Organized Crime in the Western Hemisphere: The Russian Mafia*. Paper prepared for International Studies Association, Honolulu, Hawaii, March 2, 2005.
- ¹³ Morris, R. China: *Latin America Trade Jumps*. Latin American Business Chronicle, May 9, 2011, accessed at: www.latinbusinesschronicle.com/app/article.aspx?id=4893.
- ¹⁴ Cancel, D. *China Lends Venezuela \$20 Billion, Secures Oil Supply*. Bloomberg News Service, April 18, 2010. By the end of August 2011 Venezuela's publicly acknowledged debt to China stood at some \$36 billion, equal to the rest of its outstanding international debt. See Benedict Mander's *More Chinese Loans for Venezuela*, FT Blog, September 16, 2011. Available at: <http://blogs.ft.com/beyond-brics/2011/09/16/more-chinese-loans-4bn-worth-for-venezuela/#axzz1Z3km4bdg>.
- ¹⁵ *Quito y Buenos Aires, Ciudades preferidas para narcos nigerianos*. El Universo (Guayaquil, Ecuador, January 3, 2011).
- ¹⁶ Shelley, L. *The Unholy Trinity: Transnational Crime, Corruption and Terrorism*. Brown Journal of World Affairs, Winter/Spring 2005, Volume XI, Issue 2.



Confronting Transnational Criminal Organizations

Promoting stability and economic development in the Western Hemisphere.

by LCDR FRANK NOLAN
Judge Advocate
U.S. Coast Guard Office of Claims and Litigation

Criminal organizations, working in combination with other threat actors, such as international terrorist organizations and insurgent forces, continue to corrupt, penetrate, and co-opt traditional sources of stability in the Western Hemisphere. These converging threats influence economic development and undermine international relations.

The U.S. Coast Guard, focused on the national objectives set out in the 2011 Strategy to Combat Transnational Organized Crime, seeks to prevent transnational criminal organizations from exploiting maritime infrastructure, transportation, commerce, and trade in the Western Hemisphere.¹

Corrupting Influence

Within the Western Hemisphere, transnational organized crime organizations have successfully penetrated or replaced important aspects of civil society, such as government, social, and business institutions. Through bribery and coercion, criminals influence national and local governments by targeting officials who have access to the people and functions they need to prosper.

Corrupt officials provide criminal organizations with access to lawful security and economic networks. Through these connections, criminal organizations provide societies with alternative sources of economic opportunity, security, and governance.

As increasing numbers of people rely on criminal organizations for opportunity, security, and governance, they perceive constitutional governments as corrupt, inefficient, and irrelevant.

Threatening International Relationships and Strategic Markets

In communities where criminal organizations have replaced constitutional governments as the primary sources of stability, criminal organizations employ networks to influence economic development. By increasing business costs through bribery and coercion, criminal organizations discourage U.S. companies from participating in economic activities. Thus, U.S. companies are less likely to invest in transportation infrastructure or developing natural resources.

The limited U.S. influence thus enables criminal organizations to strengthen their hold on developing nations. In addition, it provides opportunities for companies from other developed nations, which are willing to incur higher business costs, to invest in the Western Hemisphere.



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U.S. Coast Guard crews from the San Diego area intercept a suspected drug smuggling boat and crew in international waters off the coast of Baja California. The suspects were turned over to Mexican authorities for prosecution. U.S. Coast Guard photo by Petty Officer Henry Dunphy.

Such actions further limit U.S. influence on emerging markets, commerce, and transportation. So, the influence of criminal organizations threatens to disrupt U.S. access to natural resources from the region. Furthermore, it threatens to undermine regional transportation networks, upon which maritime trade and commerce relies.

Converging Threats

Other regional and transnational threat actors collaborate with criminal networks to expand the unlawful trade in drugs, other goods, and people. By expanding their networks to include international drug trafficking organizations, human smugglers, insurgents, and international terrorists, criminal organizations further undermine constitutional governments in the region. For example, drug trafficking organizations from the Western Hemisphere are forming business partnerships with criminal networks in West Africa to ship cocaine to Western Europe and the Middle East.²

As regional and transnational threat networks converge, they challenge the ability of local governments to provide stability. Notably, regional and transnational threats, such as the Revolutionary Armed Forces of Columbia and Hezbollah, continue to expand their involvement in the international drug trade to fund insurgent and terrorist activities targeting local government organizations and officials.³ Unstable societies enable international terrorist groups to conceal their activities, as they prepare to use converged networks to transport people and weapons to attack the U.S.

Smuggling

The convergence of criminal networks presents a significant threat to the United States and its neighbors in the Western Hemisphere. These networks operate sophisticated

smuggling enterprises that are capable of forging official documents, bribing and intimidating government officials, and subverting border controls.

By penetrating existing transportation infrastructures, they move criminals, fugitives, terrorists, trafficking victims, economic migrants, as well as drugs, arms, counterfeit products, and other illicit goods. Each year in the Western Hemisphere, human smuggling alone generates more than \$6.6 billion in revenue.⁴ Criminal networks use this revenue to solidify, diversify, and expand their spheres of influence.

The Internet

As criminal networks expand to the Internet, they drive black markets for all types of malware and stolen information. They operate anonymously, using extortion, fraud, and identity theft to create new revenue streams. In addition, criminal organizations use information technologies to plan, finance, and coordinate activities. These actions disrupt economic activity and undermine people's confidence in legitimate commercial and social networks.

Enabling Through Subterfuge

Criminal networks also operate "front" companies to invest in maritime transportation, trade, and commerce. Aided by dishonest professionals, including accountants, bankers, real estate brokers, financiers, and attorneys, criminal networks engage in commercial transactions to launder money, forge documents, and transport people and goods.

These clandestine relationships enable criminal networks to remain hidden. In addition, they enable criminal networks to thrive and expand, further influencing the economic development of Western Hemisphere societies.

Committing Resources to Combat Transnational Organized Crime

The 2011 Strategy to Combat Transnational Organized Crime commits all instruments of national power to neutralize transnational criminal networks, their accomplices, and collaborators. The strategy establishes five objectives:

- Federal agencies will work together to protect the people of the Western Hemisphere from violence and exploitation.
- Officials will enable partner nations to build stronger governments, capable of fighting corrupt criminal influences.
- Federal agencies will prevent criminal networks from penetrating strategic markets and financial systems.
- Agencies will target the infrastructures that the most dangerous criminal organizations use to carry out

activities. In addition, agencies will prevent criminal networks from converging with international terrorist organizations.

- The federal government will strengthen international cooperation and partnerships among Western Hemisphere governments and other organizations within civil societies to defeat transnational organized crime.

Confronting transnational criminal organizations operating in the maritime domain is a U.S. Coast Guard strategic priority. As a federal agency with the ability to shape considerable aspects of the maritime domain, such as transportation, trade, commerce, infrastructure development, investment, law enforcement, and military operations, the U.S. Coast Guard is in a unique position to deploy elements of national power to neutralize the threats transnational criminal organizations pose to the American people and their interests.

Guiding these efforts, the U.S. Coast Guard Western Hemisphere Strategy sets out the ends, ways, and means by which the U.S. Coast Guard intends to combat transnational organized crime.⁵

Understanding and Confronting Criminal Networks

To confront transnational criminal organizations exploiting maritime transportation and infrastructure in the Western Hemisphere, the U.S. Coast Guard, in partnership with other federal agencies, intends to strengthen the ability of its law enforcement and foreign intelligence programs to collect and analyze information about criminal network activities to identify patterns, partnerships, capabilities, and operating areas.

The U.S. Coast Guard will use this intelligence to support strategic, operational, and tactical planning, operations, acquisitions, and resource allocation. In addition, the intelligence will inform policy-making and risk-assessment processes.

Identifying Criminal Networks

As the U.S. Coast Guard commits greater resources to decrease the ability of criminal organizations to use the maritime domain to influence economic development in the Western Hemisphere, the service expects those organizations to change and adapt.

Prepared for such action, the U.S. Coast Guard, in cooperation with its international allies and partners, intends to develop an intelligence network within the Western Hemisphere to collaborate with existing U.S. and allied intelligence organizations to collect and analyze all-source information to support national and departmental intelligence

requirements. Such a capability will enable the U.S. Coast Guard and its partners to continually anticipate threats, as these bad actors attempt to avoid detection and capture.

Targeting Networks

U.S. Coast Guard leaders understand the success of the Western Hemisphere Strategy relies on the service's ability to work with other federal agencies, such as the U.S. Department of State, to build closer relationships with international allies.

The U.S. Coast Guard also intends to strengthen existing bilateral agreements to address how the service and its international partners will neutralize criminal organizations' abilities to exploit the maritime domain to support drug and human trafficking, smuggling, terrorism, cyber crime, and money laundering, as well as commerce and trade carried out by organizations associated with criminal networks.

In cooperation with international partners and other federal agencies, the U.S. Coast Guard will also work to promote lawful trade and commerce, infrastructure development, investment, law enforcement, and military operations in the region, as noted in the U.S. Coast Guard Western Hemisphere Strategy.

About the author:

Frank Nolan has served as legal counsel to the DHS Information Analysis and Infrastructure Protection Directorate, the Coast Guard Counterintelligence Service, and the Coast Guard Office of Counterterrorism and Special Missions. In addition, he has worked in the Operations and Environmental Law Divisions at the Office of Maritime and International Law. He holds degrees from Georgetown University, the National Defense Intelligence College, the Naval Postgraduate School, and the University of San Diego School of Law.

Bibliography

Neumann V. (2013) *Grievance to Greed: The Global Convergence of the Crime-Terror Threat*. Published for the Foreign Policy Research Institute by Elsevier Ltd.

Convergence: Illicit Networks and National Security in the Age of Globalization. Edited by Michael Miklaucic and Jacqueline Brewer. Published for the Center for Complex Operations Institute for National Strategic Studies. Washington DC: National Defense University Press, 2013.

Endnotes:

¹ *Strategy to Combat Transnational Organized Crime: Addressing Converging Threats to National Security*. Washington, DC: Government Printing Office. The White House, July 2011. Available at www.whitehouse.gov/sites/default/files/Strategy_to_Combat_Transnational_Organized_Crime_July_2011.pdf.

² See United Nations Office on Drugs and Crime. *The Globalization of Crime: a Transnational Organized Crime Threat Assessment* (2010). Available at www.unodc.org/documents/data-and-analysis/tocta/TOCTA_Report_2010_low_res.pdf.

³ Sullivan, M., & June Beittel, (2013). *Latin America: Terrorism Issues*. Washington: Congressional Research Service. Available at www.fas.org/spp/crs/terror/RS21049.pdf.

⁴ *Transnational Organized Crime: A Growing Threat to National and International Security*. Washington, DC: National Security Council. Available at www.whitehouse.gov/administration/eop/nsc/transnational-crime/threat.

⁵ *Western Hemisphere Strategy*. Washington, DC: U.S. Coast Guard, 2014.



Connectivity

The Coast Guard's central, critical need.

by CDR JAMES A. VALENTINE
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Current U.S. Coast Guard efforts to combat and dismantle transnational organized crime (TOC) in the Western Hemisphere's maritime domain, while safeguarding the nation's borders and national commerce, emphasize shared synchronized situational awareness (S3A). This linchpin provides unity of effort against threats in a complex maritime world.

To meet challenges, the Coast Guard must leverage modern technology. On an operational level that means:

- defining the characteristics of the modern information operating environment,
- optimizing operations within the environment,
- recognizing what capabilities the Coast Guard will need to bridge the gap between its industrial-age operating model and one more suited to these strategic visions.

The "Real" World

The primary problem with information environment strategic analyses is that they focus on the results of capabilities operating in the environment, rather than the properties of the environment itself. We are assailed with examples of how the Internet, mobile devices, social media, and such, have revolutionized everything from the news cycle and trade to rebellion and international crime. However, these examples only show what operating in the environment can do. It is akin to demonstrating the capabilities of a new tank, rather than discussing the advantages and disadvantages presented by the terrain within which the tank must operate.

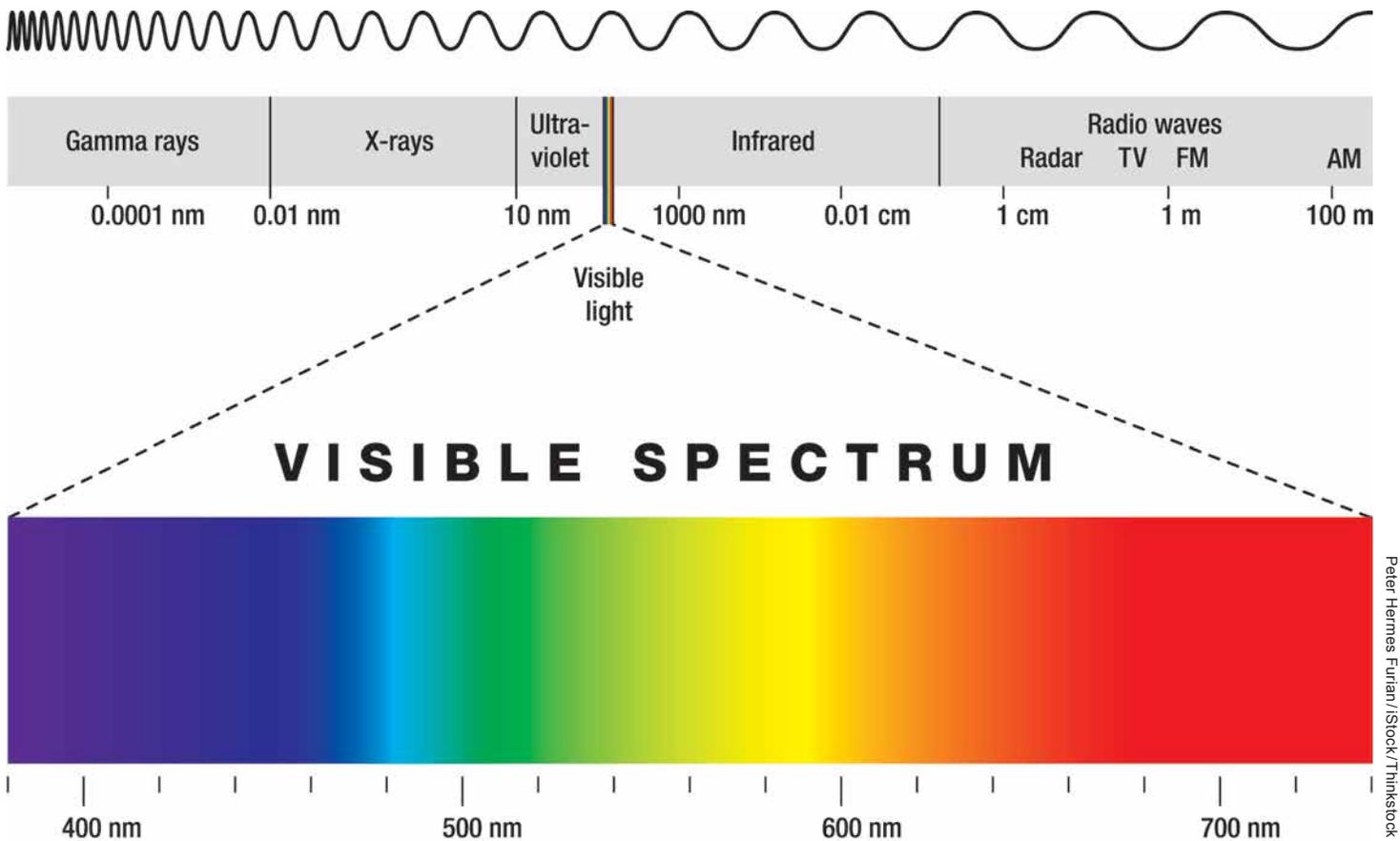
We do this because we make a reflexive judgment as to the reality of the information environment. It is apparent in our choice of words. We use terms such as "virtual" and "cyber," which carry significant conceptual baggage. These words imply something that is not "real," or is outside our ability to think about or act on, in a concrete fashion. This perception remains, despite our reliance on handheld computers that we call "smart phones," which allow us to operate in, impact, and use the information environment, regardless of time or place.

Just like the air, space, ground, and maritime environments, the current information environment is a byproduct of technological advances that allow us to take advantage of a physical domain. If the Coast Guard does not have the right technology, it cannot optimize operations. Similarly, the degree to which we can exploit the domain depends on the sophistication of our technology—a national security cutter is much more capable in the maritime domain, for example, than a Viking longboat.

When we have access to the electromagnetic (EM) domain via modern information technology (IT), we can operate in it, and, by extension, access the modern information environment. What operational results we can achieve and how



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Peter Hermes Furlan/Stock/Thinkstock

successful they are, depend on the quality of the technology, from infrastructure and architecture to hardware, software, and mobility, and our degree of expertise in the relevant subject matter, which may not be IT-related. When we do not have access to the EM domain, or our technology is sub-standard, our ability to properly leverage the information environment disappears.

Characterizing the Electromagnetic Domain

The EM domain consists of the electromagnetic spectrum, from radio waves through visible light all the way to high-energy gamma radiation. It is a fundamental force in the universe that we have harnessed, clumsily at first, then with increasing precision and skill, as society has advanced. Practical applications of the EM domain include the heat from a fire, the light from a cathode ray tube television set, and the signals from cellphone to cell tower. Given that the electromagnetic domain is tied to the fundamental physics of the universe (even what we term “empty space” radiates microwave energy at a consistent rate and level), it has fundamental properties that define it.

For example, the electromagnetic domain is everywhere, all the time. This is true in an absolute scientific sense and in a practical sense. No matter where we are, we’re in the EM

domain, whether or not we have the means to access and operate in it.

Secondly, the EM domain is symmetrical. That is, it does not “look” appreciably different from one place on Earth to another. The rules of its operation do not change, and it behaves the same regardless of our location. Most importantly, from the strategic perspective, on the surface of the Earth, it has little variation; the EM domain is operationally “flat,” providing no strategic advantage to anybody.

The most useful way to think of this would be the open ocean. While there may be currents, winds, waves, and swells that could be exploited on a tactical basis to accomplish narrow ends, there is nothing inherent in the open ocean that provides an overarching strategic advantage to one party over another. Rather, advantage comes from the combination of superior expertise and the technology used to exploit the environment.

The third important characteristic is not inherent in the electromagnetic domain itself, but is a product of its speed and the relatively short distances EM signals travel on Earth. Events in the electromagnetic domain literally occur at the speed of light—roughly 300,000 km/second—while the



SWOT Analysis: Coast Guard Operations in the EM Domain

<p>Strengths</p> <ul style="list-style-type: none"> ■ People ■ Adaptability ■ Initiative 	<p>Weaknesses</p> <ul style="list-style-type: none"> ■ Operating in the Modern Information Environment ■ “Big Data”
<p>Opportunities</p> <ul style="list-style-type: none"> ■ Existing Partnerships ■ Devolved Authorities 	<p>Threats</p> <ul style="list-style-type: none"> ■ Malevolent Actors

Earth’s circumference is about 40,000 km. An object moving at that speed could depart, travel around the Earth, and return to its starting location in about .13 seconds. Given that the average eye blink is between 100 and 400 milliseconds, or .10 to .40 seconds, it would depart and arrive “in the blink of an eye.” What this means is, we can create an effect in one part of the EM domain on the Earth, and affect a target anywhere else on the planet almost instantaneously.

While the qualifier “almost” has significant ramifications for fundamental physics, Global Positioning System satellite precision, or interstellar exploration, if we send a text or make a telephone call on Earth, the recipient is notified immediately. For all practical purposes, any perceived time lag because of signal strength, data size, mobile coverage, processing speed and such, is not an effect of the EM domain, but rather that of our technology for exploiting it. Therefore, this perception of simultaneous cause and effect, at least for earthly distances, is the final strategic characteristic that defines the EM domain.

The Information Environment

Because the modern information environment relies on the EM domain—indeed, exists only because of our technological exploits in it—it shares the domain’s characteristics of ubiquity, symmetry, and simultaneity. The “information revolution” means we can gather, process, and communicate information to anyone at any place at any time, in a “many-to-many” configuration, versus “point-to-point” or “point-to-many.” A natural question might be: “What if I am

in a cellphone dead zone, or don’t have the right technology to access the EM domain and thus the modern information environment?” In that case, these properties and characteristics do not hold.

Without IT access to the electromagnetic domain, we are not part of the modern information environment. Instead, we are part of and operating in the classical information environment, which has precisely the opposite properties—ubiquity becomes scarcity, information access and availability are asymmetrical, and its flow, rather than being near instant, is defined by friction at nearly all movement points. This is a result of the technology, not of the environment itself. For instance, a navigable river is an impediment to an army without boats, but perhaps an advantage to one with sturdy watercraft; analogously, overnight air delivery of a simple search query would hardly be simultaneous.

Strengths, Weaknesses, Opportunities, and Threats

While the EM domain and the modern information environment do not confer inherent advantages or disadvantages to any actor, like all organizations, the Coast Guard must optimize its operations in this strategic space. Therefore, the Coast Guard must understand the strengths, weaknesses, opportunities, and threats (SWOT) that the service has or faces in the environment. This is commonly referred to as a “SWOT analysis,” and is often used to develop strategies that conquer specific challenges and provide an advantage over adversaries.

Strengths: people, adaptability, initiative. Coast Guard personnel and the service’s history of adaptive responses to threats, disasters, and challenges are net positives, especially in relation to combating TOC in the Western Hemisphere. The Coast Guard values expertise rather than rank to identify the right person for the job.

Additionally, the service employs collaboration to secure the complex maritime domain, which is a social function that relies on the degree and strength of the connection among social network nodes, the ability of the individuals in the collaborating structures, and the trust among them. Another key strength of the Coast Guard is a willingness to take initiative rather than waiting for direction.

Weaknesses: operating in the modern information environment, “big data.” The Coast Guard, like many longstanding organizations with procedural roots in the industrial age, has a legacy information technology infrastructure built on administrative requirements rather than operational requirements. While we have made strides in

modernizing this infrastructure, from desktops to bandwidth to software applications, it remains a critical strategic deficit.

Similarly, big data¹ capability does not yet exist internally; and, because our IT infrastructure is a weakness, our ability to leverage external big data is limited.

Opportunities: existing partnerships, devolved authorities. The Coast Guard's existing relationships with non-governmental organizations, other countries, and federal, state, local, and industry partners represent a huge opportunity for executing the service's strategic vision of collaboration and coordination in maritime governance via S3A and its desire to combat networked transnational organized crime, defend the maritime border, and secure the maritime global supply chain.

Each partnership brings different types of expertise, information, and, in many cases, authorities. Examples include: using a regional coordinating mechanism to deconflict local maritime/riverine operations among DHS and other federal, state, and local agencies within Coast Guard sector boundaries; the Coast Guard's various bilateral and multilateral agreements with countries in the Western Hemisphere to combat maritime drug smuggling; and the service's relationships with many maritime industries, such as area maritime security counsels at each Coast Guard sector. Properly connected through the EM domain, we can bring the right information to the right people at the right time to increase the decision-making time available for proactive and responsive measures.

Threats: malevolent actors. For the Coast Guard, we view a cyber threat in the specific sense of the word—that which is actively attempting to thwart Coast Guard's missions, or damage the Coast Guard itself via the information environment.

The cyberspace realm itself is not a threat. It is an operational environment with specific properties and qualities. Anybody entering it shares the same environmental advantages and disadvantages. The quality of the results achieved in the environment depends on the means, knowledge, and will of the people exploiting it.

For instance, the "Internet of things," which gives appliances and industrial equipment a location in the modern information environment, because they are connected to the Internet, simultaneously exposes them to threats with potentially catastrophic consequences. For example, hackers could render a major cargo port inoperable, because they broke into and disabled computer-controlled loading equipment or inventory tracking systems. The fix and the backlog

would cost millions, if not billions, in terms of time lost, overtime, and perhaps perished goods or failure to meet business supply chain parameters.

At a simpler level, but equally, or perhaps even more damaging if left unchecked, fishing vessel crews could use social media to coordinate illegal fishing activity, or even plot out and analyze their electronically shared pool of sightings of Coast Guard patrols geospatially, to avoid interdiction. This is to say nothing of maritime drug smugglers or potential terrorists looking to coordinate their activities using the modern information environment.

Matching Strategy: Think Faster Than the Enemy

To accomplish our mission of solid maritime governance—a mission shared with other federal, state, local, and tribal agencies, as well as industry, international organizations, and other countries—we must connect our people to each other and to their partners at the right echelons. The Coast Guard must continue to cooperate and collaborate to secure borders, combat bad actors, and guard the commercial supply chain. We must do so with a high degree and strength of connection at every critical node to create an overarching cognitive structure that leverages its members' collective expertise, traits, authorities, and responsibilities and that is dominant over our adversaries.

This kind of cognition, possible only through strong and deep connections among knowledgeable specialists, is the only strategy that can conceptually master maritime domain complexities. Although not each piece of this cognitive construct will know everything, it will collectively know not only everything it is reasonably possible to know within its purview, but will also "know what it knows."

We must enable these cognitive networks to become powerful, yet not lumbering behemoths that lack usefulness. Appropriate shared synchronized situational awareness allows mass, simultaneous, parallel communications for reams of data—such as video feeds, situational updates, or changes to courses of action—in near real time. The strategic advantage over the adversary thus relies on maintaining a faster and stronger "observe, orient, decide, and act" loop.

Conversion Strategy: Modern Information Environment Operation Becomes a Strength

The Coast Guard must properly operate in, not just administer, the modern information environment. This requires a continuous, robust presence in the modern information environment at every point in the Coast Guard, regardless of location or time of day. The Coast Guard must collect, process, make relevant, and then make available enormous, ever-growing quantities of information from a variety of

sources, from shipboard radar to readiness reports and boarding information.

Further, this information must be integrated into the Coast Guard's data cache as soon as it is collected, whether the sensor is a video camera, a training qualification system, or a boarding team member. All of it must be available on demand to the people who need it, in the format or visualization they need it, including contextual and analytical insight that assists decision making.

Mitigation Strategy: Risk Management

The modern information environment, like any other, exposes the operators within it to certain hazards and introduces new vulnerabilities and threats. Rather than thinking about these threats in terms of cybersecurity, the Coast Guard must adopt the same mechanism it uses to mitigate threats in all other domains—risk management. The question cannot be, "How do we make our presence in the information environment secure?" But rather, "What is the operational gain associated with exposing ourselves to this threat or hazard?"

If someone or something compromises our ability to operate seamlessly and agilely in the information environment, then our security measures, while tactically successful at preventing intrusion, reduce our strategic security by impeding our cognitive processes and our ability to effectively use information. This renders us susceptible to threats.

If we can find a way to connect classified systems in hostile foreign territory during military actions, then cybersecurity and operations in the information environment are quite compatible. However, operational requirements must dictate

the security construct, not the other way around. Operators must have access to their full suite of capabilities when it is technologically possible. The role of cybersecurity is never to deny such capability, or to substitute a lesser capability, but to deliver the full capability within an acceptable level of risk, without procedural hurdles for the operator.

Our Critical Need

The common theme in each of these strategies is connectivity to the modern information environment through the EM domain, via a capable and robust IT infrastructure. Absent deep connectivity, the Coast Guard will be unable to execute strategies that promote collaboration, cooperation, or that require us to make sense of the maritime environment. We will be perpetually trapped in a strategically reactive cycle, responding only to the latest hazard or threat.

However, with strong connectivity, the Coast Guard can enact matching conversion and mitigation strategies that will allow us to proactively and strategically shape the maritime operating environment to provide less friction for legitimate activity, while simultaneously making the environment hostile and difficult for adversaries. Our field connectivity will feed shared synchronized situational awareness across the Coast Guard and our partnerships, while our strategic connectivity will allow the ready evolution of networked maritime governance regimes and constructs that can pivot to get ahead of emerging challenges.

Modern information technology provides this connectivity and allows our presence in the modern information environment, just as cutters and boats give us our presence in the maritime environment. And, just as the Coast Guard strategically recapitalizes the cutter and boat fleets, it is time to recapitalize our IT infrastructure and approach.

The Blueprint for Connectivity

At its core, connectivity is about people. While two or more systems may "talk" to each other, they do so in order that people can *do* something. The people using the system must be able to comprehend and understand the interface, what the IT tool is trying to teach them, and how to change the IT tool as needed.

Although IT is the vital technology that enables this connectivity, it is the means to an end, not the end in itself. Consequently, if we build information technology that people cannot use, find frustrating, or that adds to their administrative overhead, while providing little or no actual operational return, then people will not use it unless they must. In the end, this results in bad data, which is useless or actually harmful, cannot be used to build appropriate networks that allow the Coast Guard to execute its missions, and will accomplish no strategic end.

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Given the above, information technology must reduce the barriers people encounter when connecting with information and to each other. This requires a strategic focus on usability, data, and mobility.

Usability: Usability is a combination of factors that focus on user experience when engaging with the system. The system must assist the user in accomplishing his or her task, and the information captured must be available for multiple operational and administrative purposes.

The interface must also be intuitive—the average user should not require training to use the basic functions of any IT tool. It should be aesthetically pleasing, so that the user will not be in a rush to get out of the application or off the system.

Additionally, there should be low lag time between a user action and the system response, and the system must also have high availability—you cannot use a system that is always down for repairs. The user must be able to provide quick feedback, and that feedback must be incorporated into updates.

In short, proper usability should make information technology a joy to use.

Data: System information must be of high quality and standardized in terms of content, format, searchability, and interoperability. It must be accessible to the user anywhere, at any time, and delivered in the format that the user requires. This requires high data discipline, meaning that the right information is entered and recorded at the right time, and that regardless of entry or display format, it is stored in the rigorous, standardized ways laid out above.

System information requires planning ahead for new data standards to prevent software and hardware limitations on connectivity, new storage requirements, and new and ever larger bandwidth needs, especially as sensor integration from video feeds, radar, and even personnel become part of the S3A picture.

Mobility: Users must have access to people and information networks anywhere, at any time, while preserving all aspects of data usability integrity that they can realize at a landline location. Full user mobility is critical to modern world operations. When connectivity disappears, we cease to operate in the modern information environment, ceding advantage and dominance to adversaries who do have connectivity.

Moving Ahead

While information technology itself cannot inherently provide an advantage, as it is merely a cost of doing business in today's world, it is strategically vital, because it is the "weapons system" that allows us to operate in the modern information environment.

Mastering the maritime environment and our operations in it requires the collective expertise, traits, capabilities, and will of the Coast Guard and its partners. Connectivity, our new critical, strategic need, is the foundation upon which all future visions of the Coast Guard rests.

About the author:

CDR Valentine is a 1997 Coast Guard Academy and a 2005 National Intelligence University graduate. He is currently the chief of analysis at the Coast Guard Intelligence Coordination Center.

Endnotes:

¹ Information sets too large and/or complex to process using traditional data processing applications.



One Team, One Fight

The union between operations and intelligence.

by LCDR KELLY MOYERS
*Geospatial Intelligence Department Head
U.S. Coast Guard Intelligence Coordination Center*

LCDR MICHAEL MOYERS
*Admin, Policy and Standards Division Chief
U.S. Coast Guard Office of Cutter Forces*

Marriage is an intimate or close union. The *Encyclopædia Britannica* further defines marriage as a union “regulated by laws, rules, customs, beliefs, and attitudes that prescribe the rights and duties of the partners.”

You are probably asking yourself:

“What does marriage have to do with the U.S. Coast Guard, the operations community, the intelligence community, or the Western Hemisphere Strategy?”

The operations community and the intelligence community in the USCG each has its own set of beliefs, rules, customs, and laws, and is essentially a culture. As such, this culture is unique to the particular community, and only its members know its language, for the most part. Just like a marriage, each entity is distinct, but the union creates a relationship that includes success as well as conflict.

Moreover, you may also notice that the article authors have the same last name. And, coincidentally, work in intelligence and operations. Enough said.

As far as the Coast Guard is concerned, the Western Hemisphere Strategy lays out concepts to ensure the Coast Guard’s long-term success, including integrating operations and intelligence. Similar to following “marriage rules” between the members of a couple, this type of integration requires a relationship between operations and intelligence partners. In addition, with every relationship, there is a path, or a journey.

They Meet

In any relationship, two separate parties must meet. They must introduce themselves—their “true” selves.

Rule 1: Who am I?

Dr. Patricia Covalt, in her book describing secrets to a happy relationship, discusses the importance of knowing who you are and how you became that person. Understanding your own capabilities and limitations is imperative; you cannot educate your partner on who you are if you do not even know.

Continuing the analogy of the operations community and the intelligence community as marriage partners, introductions will include operators’ history of courage, pride, dedication, and a willingness to achieve, assist, and save. Operators are strong in resolve, have the moral courage to make difficult decisions, and understand

Marriage Rules

1. Who am I
2. Introduce yourselves
3. Learn to listen
4. Practical egalitarianism
5. Let your spouse influence you
6. Turn toward each other
7. Expect conflict and deal with it
8. Make marriage your job
9. Create shared meaning
10. The power of WE

when they lack the full picture to make an informed decision. Operators protect life at sea, protect the nation from threats delivered by the sea, and protect the sea itself. Operations encompass all 11 Coast Guard statutory missions.¹ Operators complete these missions—they do the mission.

Intelligence professionals also come from a rich background of pride and dedication. One hundred years ago a chief intelligence officer assigned to Coast Guard headquarters was responsible for securing information essential to USCG duties, disseminating this information, and collaborating with other agencies. Today, intelligence professionals are also motivated to achieve, assist, and save, but they do this through the operator. Intelligence professionals support the mission.

Individual history of each component provides a foundation of understanding. Equally important, however, is to look at the early success of the ops/intel relationship. During the 1920s and 30s, USCG intel used human sources, cryptology, and investigative tactics for great operational success in the rum runners era. This history continued through World War II (WWII) and provided tremendous impact on Allied operational success. While USCG operations continued after WWII in full force, USCG intelligence operations receded for a few decades, re-emerging as the war on drugs, maritime smuggling, and mass migration became problems for the U.S.

Rule 2: Introduce Yourself

Entering a relationship before introductions is like going on a blind date. Blind dates could be disastrous, or, by chance, end positively. Does the Coast Guard want to chance those odds? Without proper introductions, it will be difficult to make an informed decision to move forward in the relationship.

Ops and intel historically went on a lot of blind dates. Operators and intelligence officers would meet and greet before an operation. Many times the meetings were unproductive. Ignorance of each partner resulted in less effective intelligence support to the operation at hand. This led to frustration in both communities.

“It can be frustrating to chase perceived ‘ghost’ intel hits.”

—CAPT Aaron Davenport
former chief of Cutter Forces

However, both communities are becoming better at understanding the importance of rule 2. Coast Guard intelligence has discovered the importance of this and has begun a series of “open house” efforts where intel units reintroduce

intelligence basics, services, and the full range of USCG intelligence to a wide range of customers, partners, and, of course, operations personnel.

“Effective strategic communication execution within Coast Guard intelligence and criminal investigations requires all program managers to market their programs and Coast Guard intelligence capabilities.”

—RADM Christopher Tomney,
Assistant Commandant for Intelligence
and Criminal Investigations

Courting

Rule 3: Learn to Listen

Effective listening is a very powerful tool. Too often in difficult relationships, each partner attempts to emphasize his or her own point in a conversation instead of taking the time to listen to their significant other’s concerns. Communication is a two-way transaction. In effective communication, the speaker sends the message out and the listener must receive, acknowledge, and send it back.

So what happens when the partners speak two different languages? As mentioned, the operations and intelligence communities have their own worldview—in essence their own “language.” This disconnect can increase the communication gap.

Operators naturally seek target-saturated areas, thinking that is where they will find action. Intel analysts seek to make sense of the target-saturated area and provide precision guidance to help make operations more effective.

“Intel wants us to deploy to areas where there is little traffic, to gather info on the ‘grey areas.’”

—LCDR Eric Piece, cutterman

This is an example of a personality clash—each side has the same objective, but each favors a different approach. These differences emphasize the need for each side to ensure the other understands.

Take this request, for example: “Chief Smith, please request the most recent NTM of the op area for the fisheries patrol next week. We need to be prepared for the mission!” To most operators, “NTM” means “notice to mariners,” which is a means to update a nautical chart. For an intel officer, it means “national technical means,” a method of intelligence support to the operation.

To facilitate more efficient two-way communication, the Coast Guard Intelligence and Criminal Investigations staff published an intel communication plan for operators and intel professionals alike. We must practice good communication, as bad communication leads to an unhappy relationship, or, even worse, divorce.

Rule 4: Practical Egalitarianism is the Name of the Game

The next step in this relationship poses the question: Can we be on the same side? Studies show men and women view problems differently, from different perspectives, and therefore attempt to solve problems differently. The results may be similar in the end, but the paths can be considerably different.

Even in the most successful marriages that espouse egalitarian principles, women do more housework. Men typically take out the trash and change the oil in the car. However, relationships do not have to be perfectly equal to “work.” Equality does not mean to split right down the middle. It is much more effective to split tasks in a way that accounts for each partner’s strengths and preferences.

“Ops and intel are co-dependent—one cannot achieve actualization without the other.”

—CAPT Tom Crabbs
former CGC *Bertholf* commanding officer

Practical egalitarianism states there will always be jobs that one side typically does. Operators are always going to be out there getting their hands dirty. Intel analysts are always going to be ... well, who knows where they are—it’s classified.

Partnership and equality is possible, as long as there is a foundation of trust. Both partners must respect each other’s thoughts and opinions and listen to recommendations with an open mind.

Unfortunately, there are some built-in inequalities within the ops/intel relationship. Intel products, by their very nature, are not always “sure things.” But operators are held strictly accountable for operations and outcome, and assume all the operational risk.

Intel reliability versus operational risk is an obstacle that decision makers fight every day and during every mission. For the ops/intel marriage to work, the Coast Guard must be practical about the partnership, and focus on how to best integrate the two.

For example, it is impractical to push intelligence at a classification level that operators can’t receive or to move resources without a justified, communicated reason. It is also impractical to let intel make an operations decision on its own, or to let operations waste resources by completing a job inefficiently.

However, it is practical to let the operators be the experts of their resources, and allow intel to help describe their “battle field.” Moreover, while intelligence officers typically work behind restricted doors, it is practical for operators to know when to request access. Practical integration is necessary for the Coast Guard to achieve success with this marriage.

Engaged

Rule 5: Let Your Spouse Influence You

Make your spouse your partner in decision making. In marriages with partners who respect each other’s opinions and engage in power sharing, the couples tend to be much happier and fruitful. What does this rule suggest? That operators should give up power? Well, yes. Good work is going on behind all those closed doors. When the operators put aside their egos, got out of the way, and allowed a good case to come together, they have achieved more success in intel-driven operational cases.

“In the ops/intel relationship, the shared culture increases efficiency. As a symbiotic relationship, each will survive without the other, but not as well.”

—LCDR Tom Ottenwaelder
Planning Department head
Intel Coordination Center

Operators are tactical thinkers by nature, but this has become a strategic chess match. Operators must learn when to give up the conn to intel. Intelligence is meant to make an operator’s decision easier, not to make the decision altogether. It will only be easier if ops allows it to be easier. Do not resist the influence, because, as any husband knows: “Happy wife, happy life.”

The difference between a failed relationship and a successful one can be subtle. Maintaining positive images of your spouse by making an emotional connection creates a buffer against stressful times. If each partner takes time to listen, each will gain a better understanding of the other. Communicate to achieve understanding and do not challenge the knowledge or overly criticize your spouse.

What if Coast Guard operations looked like this?



Special thanks to Mr. Gregory Crymes, U.S. Coast Guard Intelligence Coordination Center senior graphic designer, for his contribution to this entirely fictional depiction of Coast Guard operations.

Ops Are From Mars, Intel Are From Venus

“The most frequently expressed complaint women have about men is that men don’t listen ... the most frequently expressed complaint men have about women is that women are always trying to change them.”¹

This translates very well to the ops/intel “marriage” in the Coast Guard.

Some operators perceive that intel’s intent is to change how or where operators conduct their missions. On the other hand, intel professionals commonly complain that operators never listen to their advice.

Endnote:

¹ Gray, Dr. John. *Men Are From Mars, Women Are From Venus: The Classic Guide to Understanding the Opposite Sex.*

Rule 6: Turn Toward Each Other

Operators must make an effort to understand intelligence capabilities. Intel must also understand operational limitations and risks. Cutters are more than just magnets on a giant world map board to be moved around at will. Intel analysts must understand cutter speed, time, and distance limitations, based on sea state and weather. Turning toward each other involves the attempt to understand a partner’s point of view. Walk a mile in your partner’s shoes. Operators with intelligence experience and intel officers with operational experience contribute enormously to this desired integration.

Married

“They fight like an old married couple!” Sound familiar?

Confrontation is inevitable. Talk to anyone who is in a second marriage. They know how a relationship can fail. They also will tell you that they learned from the failure and are working on their second marriage to make sure it does not fail.

Rule 7: Expect Conflict and Deal With It

The ops/intel marriage is no exception to daily conflicts. Operators may complain about the tedious procedures to

enter a secure facility, while intel battles with operational information timeliness. Intel can often feel snubbed by operators who do not want to collect information to assist intel analysis.

“Conflict normally comes from intel feeling underappreciated due to ops’ distractions with the most present threat. If left to spiral, it will. And both sides will underachieve.”

—CAPT Tom Crabbs

To meet mission requirements and the expectations of the American taxpayer, conflict must not become a primary binding constraint to Coast Guard operations.

Rule 8: Make Marriage Your Job

Making any relationship your job shifts your perspective and focus. Operators need to make it their job to enhance the ops/intel relationship and vice versa.

Anniversaries

Anniversaries can celebrate another year of success, another year together, another year of improvement, another year of dedication ... this list is endless. Each year a marriage continues to change and grow, each partner’s focus may change, and priorities may shift. But the common bond is the marriage—the close union of the two partners.

To ensure a continuing ops/intel union, the next rule is paramount.

Rule 9: Create Shared Meaning

“There should be more operational intelligence billets—so that there is a shared understanding of both intel’s and ops’ world of work.”

—Mr. Daren Devlin
lead intel analyst, Migrant Branch
Intel Coordination Center

Marriage can be more than just sharing a life with another partner. It is also about creating a joint culture. This shared understanding can lead to shared meaning and creating a new culture—a blend of the unique aspects each brought

to the marriage. Mr. Devlin calls the ops/intel marriage, an “intelgration.” As such, contributions from each partner benefit the other and the marriage as a whole.

Rule 10: The Power of We

Two strategic priorities of the Western Hemisphere Strategy are to combat networks and secure our borders. With the overwhelming increase in the complexity of illicit networks and tremendous challenge in securing our coastal borders, the Coast Guard must harness the power of our own networks and synergize our collective efforts.

Ops and intel must never forget the power of collaboration. When intel and ops work in synergy—communicating to each other, understanding messages, and responding to each other’s needs—the end game is priceless, and anything is possible.

About the authors:

LCDR Kelly Moyers is a career intelligence professional, with nine years of intelligence experience. She is one of the few Coast Guard officers who deployed to Afghanistan. Her service includes field level, strategic level, and workforce management experience. Lcdr Moyers also holds a master’s degree in science and strategic intelligence.

LCDR Michael Moyers is a career cutterman with more than 12 years of operational time and sea service. His service includes patrol boat and major cutter operations including command positions, as well as strategic-level budgeting and planning for the cutter fleet. Lcdr Moyers also holds an MBA from the University of Phoenix.

Bibliography:

Aris, Sharon. *Being Married: Your Guide to a Happy Modern Marriage*. Allen & Unwin, 2005.

Covalt, Dr. Patricia. *What Smart Couples Know: The Secret to a Happy Relationship*. AMACOM, 2007.

Gottman, John M. *The Seven Principles for Making Marriage Work*.

Haltzman, Scott, and Theresa Foy Digeronimo. *The Secrets of Happily Married Men: Eight Ways to Win your Wife’s Heart Forever*. John Wiley & Sons (US), 2006.

Coast Guard Publication 2-0, Intelligence.

Coast Guard Publication 3-0, Operations.

Endnote:

¹ By law, the Coast Guard has 11 missions:

- Ports, waterways, and coastal security
- Drug interdiction
- Aids to navigation
- Search and rescue
- Living marine resources
- Marine safety
- Defense readiness
- Migrant interdiction
- Marine environmental protection
- Ice operations
- Law enforcement

Securing the Marine Transportation System

What challenges lie ahead.

by LT JONATHAN HSIEH
U.S. Coast Guard Reserve
Program Analyst
U.S. Maritime Administration



The best way to describe the marine transportation system (MTS) is to talk about the processes, policies, and infrastructure needed to move cargo via vessels, ports, terminals, and intermodal connections to inland locations. The process starts with vessels operating on a reliable waterway system with adequately dredged and maintained shipping channels, inland waterways, and lock and dam systems.

Ports and terminals must be able to handle the cargo that comes in and goes out, while the land-side connections that move cargo inland and to ports must be reliable and efficient to prevent congestion. These connections—including rail, roads and highways, and inland waterways for container-on-barge shipping—must be secure, reliable, and efficient.

Federal agencies charged with maritime governance must ensure up-to-date public policy keeps the MTS efficient, economically competitive, and safe.

Ed Metz/iStock/Thinkstock



The MTS is a large and dynamic system of vital importance to our nation's economic wellbeing and national security. Each of the five main components: navigable waterways, ports, intermodal connections, vessels, and users work together so efficiently that most Americans take it for granted.¹

To keep the marine transportation system operating the way it should, the U.S. Coast Guard created a Western Hemisphere Strategy that outlines its policies to safeguard maritime commerce.

Globalization

In this increasingly connected world, nations rely on an efficient global transportation network for trade and travel. The Bureau of Transportation Statistics reports that 77 percent of U.S. merchandise trade by weight, and 45 percent by value, moves on water. Additionally, it is anticipated that the marine transportation system will grow for decades to come.²

Domestically, the marine transportation system produces jobs that pay a living wage. Merchant marine officers and sailors work on vessels in our foreign-trading U.S.-flagged fleet, the coastwise U.S.-flagged fleet, on the inland waterways systems, and in harbors. Logistics and port operations experts are entrusted with handling all types of cargo as vessels moor. As of 2011, the U.S. Maritime Administration



A U.S.-flagged container ship moors in Dutch Harbor, Alaska, after a voyage from Oakland, Calif., during a 10-port run supporting U.S. foreign trade. U.S. Coast Guard photo by author LT Jonathan Hsieh.

reported 60,000 jobs directly related to water transportation, more than 90,000 in port services, and approximately 100,000 associated with the U.S. shipbuilding and repairing industry.³ In addition, millions of jobs throughout the nation depend on international cargo delivery.

Not only do our nation's waterways support the vital coastal vessel and inland tug and barge industry, but "marine highway corridors" on these waterways also allow trailers and containers to move on water, via container-on-barge shipping and short-sea shipping. The marine highway also provides a method to ship cargo and heavy equipment, allowing shippers to bypass highway and surface street weight limitations.

Moreover, the marine transportation system also sustains the commercial and subsistence fishing industries, provides nationwide recreational boating opportunities, and even forms an integral part of public transit. For example, people near coasts and rivers sometimes use passenger ferries to reduce the time it takes to commute to work. In effect, the MTS benefits all of us, and it is the job of all who use and work on it to spread that awareness.

All Hands on Deck!

To support the marine transportation system, the government and the maritime industry must collaborate to safeguard maritime commerce and achieve peak efficiency in the maritime industry. Marine transportation system governance is achieved through a variety of responsibilities among more than a dozen federal agencies, which focus on sustaining and increasing:

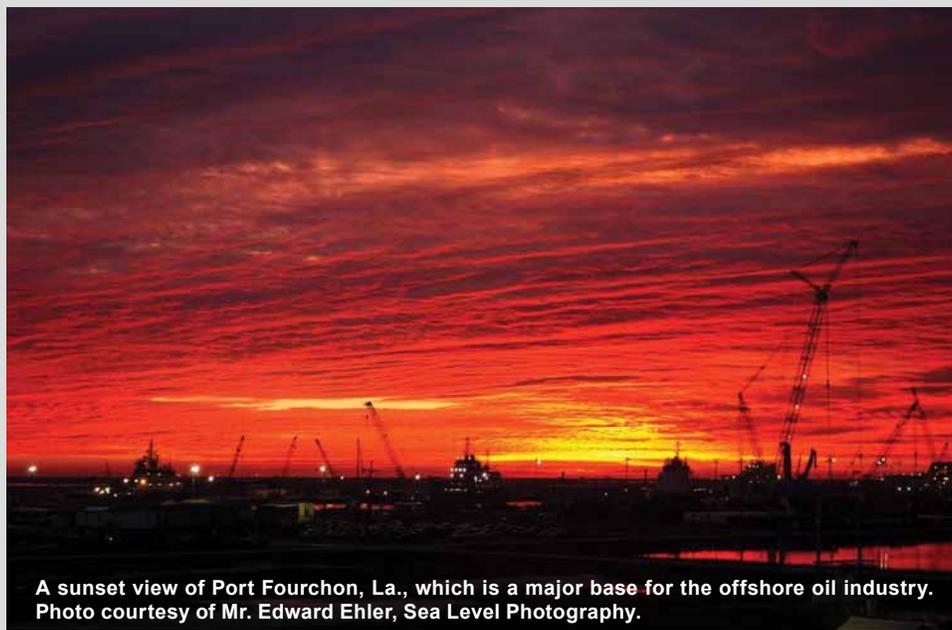
- capacity,
- safety and security,
- environmental stewardship,
- resilience and reliability,
- sound finance and economics.

Local and state governments must also advocate for a reliable system that benefits the local community, so



A crewmember stands watch as a vessel transits Cook Inlet, Alaska. Photo courtesy of Mr. Trevor Daviscourt, an American Maritime Officers mariner.

Emerging Markets and Technologies



A sunset view of Port Fourchon, La., which is a major base for the offshore oil industry. Photo courtesy of Mr. Edward Ehler, Sea Level Photography.

- **Offshore Wind Technology:** With the advent of offshore wind technology, it is essential that government agencies and industry come together to ensure safe commercial traffic navigation in coastal waters.
- **Liquefied Natural Gas:** Following the expansion of the Panama Canal in 2015, 86 percent of the world's current LNG will be able to transit through the canal.¹ This will facilitate U.S. LNG exports on specific routes to Asia and other locations.
- **Expanded Energy Trade:** The U.S. Energy Information Administration has noted the largest increase in annual output of U.S. crude oil production since 1859, due to new technologies such as horizontal drilling, in conjunction with multi-stage hydraulic fracturing.² This expansion

has contributed to a sharp increase in tanker construction in U.S. shipyards.

- **Outer Continental Shelf Activities:** The increase in mobile offshore drilling units and their ancillary services, such as U.S.-flagged offshore supply vessels, has expanded activity in the Gulf of Mexico. This expansion will require oversight in the safety, security, economic, and environmental arenas, and policymakers must match the speed of this growing industry.

Endnotes:

- ¹ House Transportation and Infrastructure Committee. *The Water Resources Reform & Development Act*, 2013.
- ² U.S. Energy Information Administration, *Short-Term Energy Outlook Supplement*, February 2013.

state departments of transportation and metropolitan planning organizations are now incorporating marine transportation and intermodal connections into their planning processes. Moreover, private industry also plays an essential role by investing in the marine transportation system and contributing knowledge and skills to federal advisory committees such as the National Freight Advisory Committee, the National Maritime Security Advisory Committee, and the Marine Transportation System National Advisory Council.

Marine Transportation System Challenges

Probable upcoming MTS challenges include:

- reconstructing aging facilities,
- deepening channels,

- expanding existing capacity to accommodate larger vessels,
- sustaining and growing the U.S.-flag industry,
- improving port access,
- obtaining accurate data on our nation's infrastructure and marine transportation activities.

To address these, the U.S. Maritime Administration began work in 2013 to develop a new national maritime strategy that will chart a sustainable course for the maritime industry and lay the groundwork to capitalize on opportunities that will strengthen the nation's leadership role within the international maritime community.

Aging infrastructure will be a challenge in maintaining a resilient MTS, as many lock and dam systems on the inland



waterways are more than 50 years old. Today, the Water Resources Development Act authorizes civil works projects under the purview of the U.S. Army Corps of Engineers, funded via the Harbor Maintenance Trust Fund and Inland Waterways Trust Fund. The latest version of this legislation, the Water Resources Development Act, was signed into law by President Obama on June 26, 2014. The new legislation addresses challenges by streamlining the project delivery process, promoting fiscal responsibility, and strengthening our water transportation networks.⁴

Safeguarding the MTS

Safeguarding maritime commerce is more than just ensuring physical security. Security comes in the form of a resilient system that can weather storms or other events. In the years ahead, freight volumes are slated to increase. This means more freight will flow in and out of U.S. ports and on our waterways, highway systems, and rail systems. Federal agencies, local/municipal and state governments, industry, shippers, and operators all have an active role in safeguarding maritime commerce.

The main federal agencies involved in safeguarding the MTS include:

- **U.S. Coast Guard:** There is an increased need for Coast Guard services, encompassed over six programs: maritime security operations, maritime law enforcement, maritime prevention, maritime response, defense operations, and marine transportation system management.
- **U.S. Army Corps of Engineers:** The Corps of Engineers has been charged with maintaining and improving navigable waterways. Its nine business areas and its civil works mission ensure a quality marine transportation system. It will be challenged in completing existing construction projects, along with operating and maintaining existing water resources infrastructure.
- **The Environmental Protection Agency:** EPA regulations mitigate environmental impact and establish the correct dredge spoils placement, evaluate greenhouse emissions, assess climate change, and address ballast water requirements.
- **U.S. Maritime Administration:** The Maritime Administration is the key advocacy agency for the U.S. merchant marine and supports the MTS, including the U.S.-flagged fleet and America's marine highways, and administers several programs that support the merchant marine.

- **U.S. Customs and Border Protection:** The U.S. Customs and Border Protection enhances our nation's global competitiveness and facilitates safe and legitimate international trade.

Additionally, increased interagency cooperation among federal agencies through federal advisory committees, the Committee on Marine Transportation Systems, and other joint efforts must continue, as the maritime realm evolves.

Benefits

Put simply, every American citizen benefits from a safe and resilient MTS. Farmers and coal miners benefit from export activity, the American consumer benefits from efficient container terminals and efficient intermodal connections at ports that can quickly move goods to market. Terminal operators, longshoremen, and tugboat operators benefit from vessel port calls. Rig workers, roustabouts, offshore supply vessel personnel, and dynamic positioning operators benefit from the Gulf of Mexico energy trade. Merchant mariners benefit from having safe vessels on which to work that provide an opportunity to practice their craft.

As an industry, we must continue to champion this largely hidden gem that employs hundreds of thousands of Americans, while ensuring our foothold in the global domain.

About the author:

LT Jonathan Hsieh is a Coast Guard Reserve officer, currently employed by the U.S. Maritime Administration Office of Policy and Plans. His previous assignments include tours on USCGC Bertholf and as program manager for the Sea Partners Campaign. He holds a B.A. in marine transportation from the California Maritime Academy, an MPA from Virginia Tech, and a U.S. Merchant Marine second mate license.

Endnotes:

- ¹ Committee on the Marine Transportation System, *National Strategy for the Marine Transportation System*, July 2008.
- ² U.S. Department of Transportation, Bureau of Transportation Statistics, *Modal Shares of U.S. Merchandise Trade Handled by Land, Water, and Air Gateways by Value and Weight: 2007*.
- ³ Maritime Administration. 2011 *U.S. Water Transportation Statistical Snapshot*, November 2013.
- ⁴ House Transportation and Infrastructure Committee. *The Water Resources Reform & Development Act*, 2013.

Marine Transportation System Security

Safeguarding commerce through contingency preparedness and incident management.

by MR. SAMUEL J. KORSON
U.S. Coast Guard

Office of Contingency Preparedness and Exercise Policy

Since its inception, the United States has been a nation dependent on the world's oceans for commerce. In the 21st century, with almost 100,000 miles of shoreline, 3.4 million nautical square miles of exclusive economic zone, and 95 percent of the nation's international cargo carried by maritime commerce,¹ the nation depends on the sea as much, if not more, than two centuries ago. And now, in addition to our Atlantic and Pacific coastlines, the nation's marine transportation system also includes the ever-more-accessible waters of the Arctic.

Protecting commercial ventures and the environment are daunting tasks, but the U.S. Coast Guard is uniquely

“Despite significant challenges, we must pursue a responsible approach to the marine environment to maintain and enhance the commercial ventures relying on healthy and productive oceans.”

**—U.S. Coast Guard
Vice Admiral Peter Neffenger**



With diminishing Arctic ice, U.S. Coast Guard maritime security missions now extend farther north for longer periods of time. U.S. Coast Guard photo by Petty Officer Charly Hengen.

positioned to do this and has been engaged in such activities for more than 200 years. That said, the Coast Guard relies on domestic and international partners to perform its multi-mission maritime work.

Maritime Partners

In January 2011, the North Atlantic Treaty Organization (NATO) adopted a new alliance maritime strategy that further promotes operational flexibility and emphasizes the importance that NATO places on working with its partners to ensure maritime security. Through this strategy, NATO recognizes that we live in an era of globalization. As such, the world's oceans contain many important communications, commerce, and transportation routes (the Panama Canal, Suez Canal, the Straits of





U.S. Coast Guard assets play an important role in securing maritime safety and security. U.S. Coast Guard photo by Petty Officer Kevin J. Neff.

Hormuz, and the Red Sea, just to name a few), and securing these routes is vital to the international community.²

We also live in an era of terrorism, piracy, asymmetrical warfare, and what appears to be increasing instability with nature. These challenges make seaborne commerce risky, even as it is increasingly important.

Additionally, our nation’s marine transportation system (MTS), which includes our network of navigable waters, public and private vessels, port terminals, intermodal connections, shipyards, vessel repair facilities, and the personnel who operate and maintain the infrastructure, is an integral part of the global supply chain.

A physical or cyber attack on the MTS could result in catastrophic impact to national or regional economies and may affect national security. The system is equally vulnerable to disruptive natural disasters such as Hurricanes Katrina or Sandy. This is why the marine transportation system must not only be safe and secure, but also highly resilient. The Coast Guard, through its contingency preparedness and exercise program, is well suited to provide the basis for the nation’s defense, its economic security, and the safety of these vital sea lanes of commerce and communication.

The Coast Guard is also empowered by legal authorities that allow it to be a force multiplier in maritime commerce protection.³ For example, U.S. Coast Guard personnel assigned

to foreign ports are empowered to inspect containers and other cargo destined for U.S. ports. Should cargo fail to meet U.S. standards, it is not permitted to depart that port for an American destination.

The Coast Guard is well poised and empowered to ensure that the U.S. is safe and secure; and it accomplishes this through three preparedness measures:

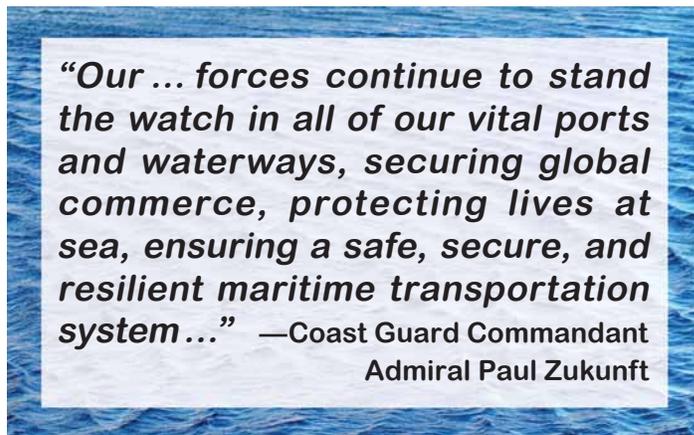
- plans,
- incident management and crisis response,
- a very active exercise program.

Plans

Contingency plans are written in different formats, depending on the contingency and characteristics of the potential response. U.S. Coast Guard

unit operations plans address multiple contingencies, including oil and hazardous material spills, hurricanes, fires, natural disasters, alien migration interdiction operations, and search and rescue. Some contingency plans are required by legislature, such as the Oil Pollution Act of 1990 and the Maritime Transportation Security Act of 2002, and have specific formats; other plans are not so formalized. Additionally, today’s contingency plans are unclassified, so there is less of a risk in accidentally compromising classified information.

In this day of shrinking budgets and personnel cutbacks, it is important that response agencies are attuned to one another, to effectively collaborate on response efforts.



Therefore, Coast Guard planners share their plan-writing efforts with their response partners, including port and vessel personnel, state and local representatives, as well as other government and non-government agencies.

Incident Management and Crisis Response

The Coast Guard also can help mitigate incidents through its assets. For example, Coast Guard vessels can be used as floating incident command posts and/or communications centers. Being self-contained, these floating platforms are ideal for performing command and control functions for incident command posts—offshore and in ports and inland waterways.

Incident management also crosses all aspects of Coast Guard operations, whether it is search and rescue, law enforcement, alien migration interdiction, or any other Coast Guard function. Through incident management, the Coast Guard works with its response partners, as well as international partners such as Canada and Mexico, sharing each other's experiences in contingency preparedness and planning. Doing so helps to broaden each nation's preparedness system, ensuring that the actions of their respective response agencies are well coordinated, that there is no overlap, nor are precious resources wasted.

Most importantly, coordinated efforts, using an incident management system such as the National Incident Management System Incident Command System, mitigate loss of life and/or property. Moreover, agencies working together within a common framework, toward common goals, and under a unified command system, find the working atmosphere more readily conducive to the given tasks.

Incident management coordinates and integrates the activities necessary to build, sustain, and improve the capability to prevent, prepare for, mitigate, respond to, and recover from emergencies and disasters. Preparedness, in the form of planning, is a fundamental part of a successful incident management program that includes the plans themselves, exercises, and properly trained personnel who use lessons learned from past exercises and/or real-world experiences.

Exercises

In addition to the planning effort to prevent, respond to, and mitigate contingencies, it is extremely prudent that Coast Guard plans are tested in an orderly fashion, so each plan is a viable working document.

Starting with a concept of exercise, the unit determines whether part of the plan or the entire plan needs to be exercised. The exercise tests the plan, personnel, and response partners. As time constraints and/or funding determine exercise length, planners can test smaller portions of a plan

The Marine Transportation System Recovery Unit

A Coast Guard unit commander's authorities, as the captain of the port (COTP), federal maritime security coordinator, and federal on scene coordinator are vital to leading short-term recovery activities, as most recently noted in Coast Guard Sector New York's response to Hurricane Sandy.

During such incidents, the COTP has an additional asset to assist in recovery—the Marine Transportation System Recovery Unit (MTSRU)—an element in the Incident Command System structure. As such, the MTSRU tracks and reports MTS status, develops a clear understanding of critical recovery pathways, develops courses of action to support marine transportation system recovery, provides an avenue of input to the response organization for stakeholders, and identifies and documents long-term restoration issues for the incident command.

MTSRUs have been dispatched several times to assist in coordinating the response to incidents that affect maritime commerce. When a 7.0 magnitude earthquake devastated Haiti, the U.S. deployed more than 800 Coast Guard men and women to aid in humanitarian relief efforts, including evacuating injured personnel, delivering supplies, assessing port facilities, and aiding port recovery operations, all through the MTSRU.

through seminars or table-top exercises. In many cases, these smaller exercises yield results that have been instrumental in familiarizing participants with partner response organizations and have helped put the finishing touches on new plans.

The Coast Guard also focuses on multi-year exercise activities and capabilities-based exercises. The newest tool, in the exercise toolbox—the contingency preparedness assessment (CPA)—is a self-appraisal tool that helps identify gaps in a unit's preparedness. The commander's exercise and training strategy is yet another integral part of overall exercise planning, whereby the commander conveys a strategy to make the best use of the available resources to improve preparedness using exercises and exercise preparatory training.

Although contingency preparedness planning may not be as glamorous as flying helicopters or planes or commanding major Coast Guard cutters, the U.S. Coast Guard's contingency preparedness and exercise policy is critical to the U.S. Coast Guard and the nation's maritime commerce. The





Response partners test an exercise plan. U.S. Coast Guard photo by Petty Officer Brandyn Hill.

result of this preparedness is a series of plans, exercises, and incident response that ensures the U.S. Coast Guard is and always will be ready to ensure maritime commerce safety and security.

About the author:

Mr. Korson served in the U.S. Coast Guard and reserves for more than 22 years. Now a federal employee, he works on policy and doctrine in the Office of Contingency Preparedness and Exercises at Coast Guard headquarters. He is a graduate of Mary Washington College, the U.S. Naval War College, and Pennsylvania State University.

Endnotes:

- ¹ CG Publication 1, Doctrine for the U.S. Coast Guard, p. 5, February 2014. Available at www.uscg.mil/doctrine/CGPub/Pub_1.pdf.
- ² Available at www.nato.int/cps/en/SID-A3BDD220-EFAC3500/natolive/news_77240.htm?selectedLocale=en.
- ³ Section 101 of Title 10, U.S. Code states that the U.S. Coast Guard is a member of the United States Armed Forces. Section 379 of the same section of code states that U.S. Coast Guard personnel may be assigned to naval vessels, to carry out law enforcement operations, allowing the U.S. Navy to assist the U.S. Coast Guard in law enforcement operations. Title 14 of the U.S. Code provides the U.S. Coast Guard with the authority to control anchorages and movement of vessels in navigable waters of the United States, to ensure safety and security of both vessels and anchorage/port facilities. Finally, Title 46 provides authority to regulate and prevent safety and security incidents occurring on United States or foreign flagged vessels, and additional authority for maritime drug interdiction.

The Silent Threat

How it may affect future Coast Guard operations.

by Ms. HILLARY LEBAIL
*Presidential Management Fellow
Federal Emergency Management Agency*

Coast Guard history is rich in its proud tradition of excellence and service to the United States. Guardians use their success and lessons learned from the past to adapt to anticipated challenges. This ability is crucial in a world of diverse maritime risks and threats. Specifically in the Western Hemisphere, the Coast Guard's primary area of operations, growing threats and challenges are emerging, such as transnational organized crime (TOC) networks, globalization, an increasing reliance on the marine transportation system, and new technologies that result in cyber threats to critical infrastructure.

These risks and threats are converging, even as they strengthen, but one in particular has the capability to multiply, exacerbate, and create new risks. It can threaten operations from anywhere and in any form. It is not always noticed; and, even when it is, some of its effects are so gradual they are often overlooked. What is "it"? Climate change—which the Coast Guard recognizes as a serious risk to America's future.

The Basics

Climate change is unlike any other threat the Coast Guard is likely to face. Compared to transnational organized crime or terrorism, climate change is not an enemy in the traditional sense. Regardless of our best efforts, climate change will forever change the maritime environment in which the Coast Guard operates. Therefore, it is vital that we understand how it is likely to influence our vast array of operations in the Western Hemisphere.

An increase in average global temperatures is resulting in regional effects such as rising sea levels, ocean warming and acidification, increases in extreme weather event frequency and intensity, and changes to available natural resources. Consequently, climate change is becoming more

of a threat to national security. However, to understand this reasoning, we must first understand the concept of climate change itself.

For instance, there is a distinct difference between the terms "weather" and "climate." In its simplest terms, weather is short term, locally focused, and what an individual observes when he or she looks out the window on any given day. Climate refers to weather trends over a period of time, typically 10 years or more. Strategists and policy makers refer to these longer-term observations when discussing climate change.

The Greenhouse Effect drives the climate change we experience today. To understand its influence, think of the Earth wrapped in a blanket composed of gases in the atmosphere, which keep the Earth warm and allow our planet to sustain life. As more greenhouse gases, such as carbon dioxide and methane, enter the atmosphere, this blanket becomes thicker and more effective, heat is retained, and the Earth's



The Coast Guard Cutter *Healy* takes part in an Arctic survey that will help define the Arctic continental shelf. U.S. Coast Guard photo by Petty Officer Patrick Kelley.



Chief Petty Officer Jeremiah Grey, Station Sandy Hook's engineering petty officer, shows the destruction in the boathouse caused by flood waters after Hurricane Sandy. U.S. Coast Guard photo by Petty Officer Luke Clayton.

overall temperature increases. Whether caused by natural or human circumstances, this increase in our planet's temperature, more commonly known as global warming, has a significant and long-lasting impact on our climate.

From a practical standpoint, you might turn up your air conditioning or visit the local pool on a hot summer day. The Earth operates much the same way. Over time, the Earth will try to naturally cool itself and reduce the amount of excess heat in the atmosphere. This creates a long-term trend of unpredictable weather from severe storms to droughts—a phenomenon better known as climate change.

Effects and Challenges

Some say that climate change represents one of the greatest challenges of our time, but it is a challenge uniquely suited to America's strengths. President Obama's Climate Action Plan, announced in June 2013, contains three key pillars:

- cutting America's carbon pollution,
- preparing the United States for climate change effects,
- leading international efforts to combat global climate change and prepare for its effects.

The second and third pillars focus primarily on adaptation efforts and the need to understand global climate change. Perhaps nowhere else in the world is climate change more noticeable than in the Arctic. Temperatures are warming twice as fast within the Arctic Circle than anywhere else.

During summer months, a new ocean is emerging, requiring Coast Guard presence—increasing the traditional area of operations and further stretching available resources.

The melting sea ice is largely due to air and ocean current circulation, which moves heat energy away from the equator and toward the poles. Ice and snow reflect heat back into space and help cool the Earth, but as sea ice melts, the oceans absorb even more heat energy.

Moreover, melting permafrost and warming waters release methane, a far more potent greenhouse gas than carbon dioxide. While it may be taking place at the top of the world, what happens in the Arctic does not stay in the Arctic, and combined, these effects further accelerate planetary warming.

As climate change continues to impact the globe, more extreme and unpredictable weather events are expected to occur more frequently. These events incur catastrophic

costs to the federal government and further strain Coast Guard capabilities, as the service is already fulfilling various missions elsewhere in the country and throughout the world.

Sea-level rise is another consequence of climate change that affects the waters where the Coast Guard operates. It occurs slowly, which means it is often overlooked as a threat, but has the potential to be one of the most significant effects of climate change. Moreover, as the oceans absorb heat trapped in the atmosphere, the newly warmed water expands and causes a corresponding rise in sea level. And finally, melting ice (especially the massive Antarctic and Greenland ice sheets), contributes to sea-level rise. During the past century, sea levels have risen between 4 and 8 inches.¹ Over the past two decades, sea levels have risen almost twice as fast as the average during the 20th century.²

For many coastal and island communities, sea-level rise, coastal erosion, flooding, and fresh water contamination are all major concerns. Public installations, including Coast Guard stations that are impacted by rising water levels, may be forced to relocate or rebuild infrastructure. Strains to these security facilities, power systems, fresh water supplies, and communication networks—whether it be the result of extreme temperatures or flooding—can greatly affect the Coast Guard's ability to carry out its missions.

In addition, larger storm surges during extreme weather events also cause concern. For example, during Hurricane Sandy, Battery Park in New York saw a record-breaking storm surge of 13.88 feet. This was far greater than the



Boarding teams from a Coast Guard cutter determine that these vessels are rigged for illegal high-seas drift net fishing. U.S. Coast Guard photo by Petty Officer Jonathan R. Cilley.

previous record, which was slightly more than 10 feet during Hurricane Donna in 1960. Such events have required an increased Coast Guard presence for search and rescue and port reconstitution. When ports are forced to close due to extreme weather events, the world's increasing reliance on the marine transportation system makes restarting trade operations especially critical for economic stability. Even bridges over tidal estuaries and rivers are susceptible to a rise of just a few inches in sea level. While they may currently be up to code, some bridges might not be able to structurally withstand greater rises in sea levels. Coast Guard and merchant vessels that could once pass safely underneath a bridge may, in the future, find that safe passage is not possible without some modification.

The Threat

What makes climate change such a unique threat to national security is that it doesn't just create threats, it acts as a threat multiplier. Stressors that already exist in the world, particularly in our own Western Hemisphere, are or will be touched in some way by climate change. It can have significant geopolitical impact around the world and contribute to poverty, environmental degradation, and further weaken fragile governments.

These challenges threaten stability in much of the world. As temperatures and the aforementioned challenges increase,

so too may aggression, violence, and international conflict. Droughts, tropical storms, and violence among or within nations could lead to increased population movements. Short-term, disaster-driven migration, and environmental refugees could create new challenges for the Coast Guard. These population movements might include illicit markets and activity across the U.S. border, such as transnational organized crime and terrorism.

In Western Hemisphere countries where natural disasters can strain economies and increase political, economic, and social instability, climate change can greatly exacerbate other forms of TOC networks and terrorism. The potential increase in extreme weather events creates a unique window of opportunity for TOC networks to exploit weakened rule of law and ineffective governance that could follow in the wake of natural disasters.

Climate change can also lead to food insecurity and competition for resources, which may lead to new international conflicts. Shifts in temperature and rainfall impact agricultural productivity, which contributes to food and water scarcity, especially in vulnerable areas. This in turn can increase the spread of disease, incite violence, and spur or exacerbate mass migration. Natural resources like fish stocks may be reduced or fish may migrate to new areas due to climatic changes. Seafood is an important protein resource for much



of the world, and, as ocean temperatures increase and ocean waters become more acidic, reefs and other marine ecosystems will degrade. As a result, marine life will migrate to new and more hospitable locations, without regard for international boundaries or exclusive economic zones.

Illegal, unreported, and unregulated fishing may increase, as current fishing grounds become less productive, new fishing grounds become available, and disputes arise due to competition for migrating resources. In addition, fishermen in some regions where the stocks they rely on for financial stability have migrated to new regions or been overfished, may, in a desperate attempt to make a living, turn to illegal activity, including smuggling drugs, weapons, and humans across international boundaries. The Coast Guard's role in fisheries enforcement will be necessary to monitor and protect the safety, security, and environmental sustainability of these regions. This will make operations in the maritime environment more challenging in the future.

Looking Ahead

Indeed, climate change may initiate or increase threat activity such as disaffected populations, border security, community resilience, and crisis management.

Climate change challenges and influences might not necessarily be felt in the near term, but if left unchecked, they have the potential to threaten economic growth and regional stability. Fortunately, the Coast Guard has a successful history of planning and adapting to changing environments, which will be necessary to confront the growing threat of climate change.

A new and broad strategic focus is warranted, and the Coast Guard Western Hemisphere Strategy is the first step in a decisive approach to climate change. This document emphasizes three basic strategic priorities to guide Coast Guard operations in the Western Hemisphere and to ensure our nation, markets, and oceans will remain secure and prosperous for the long term:

- combating networks,
- securing borders,
- safeguarding commerce.

Underlying each strategic priority is recognition that climate change will, in some way, amplify risks and threats. The Western Hemisphere Strategy addresses a range of issues, including how to safeguard maritime and shore-based infrastructure in preparation for future climatic impact and what new authorities the Coast Guard may need to operate in a maritime environment affected by climate change.

In the coming decade, the Coast Guard must broaden its strategic focus to safeguard our nation's primary security interests and recognize that climate change will exacerbate an ever-increasing list of threats and hazards. The maritime environment is changing, and to keep up, the Coast Guard must adapt. Climate change will not be without its challenges, but the Coast Guard, with its proud legacy and innovative strategic approach, is more than capable of meeting whatever challenges the future holds.

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Ms. Hillary LeBail is a presidential management fellow currently detailed to the State Department's Office of Ocean and Polar Affairs. Her home agency is FEMA, where she works as an analyst in the National Preparedness Assessment Division, evaluating how prepared the nation is to prevent, respond to, and recover from disasters. She also recently completed an assignment with the U.S. Coast Guard's Office of Emerging Policy, where she helped shape the Coast Guard's Arctic Strategy, Western Hemisphere Strategy, and issues relating to climate change.

Endnotes:

- ¹ *Global Climate Change*. Washington, DC: National Aeronautics and Atmospheric Administration, 2013.
- ² *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Summary for Policymakers*. Cambridge, UK: Cambridge University Press, IPCC, 2013.

Bibliography:

- Neffenger, Vice Admiral P. *Safeguarding our Hemisphere*. Proceedings Magazine. U.S. Naval Institute, October 2013.
- Spaner, Captain J.S. & Hillary LeBail. *The Next Security Frontier*. Proceedings Magazine. U.S. Naval Institute, October 2013.
- Global Climate Change*. National Aeronautics and Atmospheric Administration, 2013.
- In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Summary for Policymakers*. Cambridge, UK: Cambridge University Press, IPCC, 2013.
- National Security Implications of Climate Change for U.S. Naval Forces*. Washington, DC: The National Academies Press. National Research Council, 2011.
- What We Know: The Reality, Risks, and Response to Climate Change*. The AAAS Climate Science Panel, 2014.
- Fact Sheet: Executive Order on Climate Preparedness*. Washington, DC: Office of the Press Secretary, the White House, 2013.



The Coast Guard's Forgotten Fleet

The state of the inland aids to navigation tenders.

by LT SEAN DOLBOW

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The U.S. western rivers, including the Mississippi River and its tributaries, are highly dynamic. Sedimentation alters river bottoms and the course of the rivers themselves. Fluctuating water levels, also known as river "stage," mean once navigable portions of the river may become hazardous and vice versa.

Some of these changes are recurring and predictable, such as low river stage during winter. The U.S. Army Corps of Engineers even controls the river stages to an extent. Other events, such as droughts and floods, even though they are part of the natural cycle of the river in the long term, are less predictable and can have drastic effects on the annual cycle. In 2011, for example, the western rivers experienced record flooding. But just one year later, the rivers experienced record lows due to prolonged drought. This exacerbated the already seasonably low river stage during the winter of 2012–13.

Mississippi River Challenges

The Army Corps of Engineers works on the Mississippi River to maintain a channel that is at least 300 feet wide and 9 feet deep. The Coast Guard marks the navigable portions of the river, adjusting buoy positions, as navigable water boundaries change, according to the river stage or obstructions.

When the river stage is high, the navigable portion of the river may expand beyond the

maintained channel, and the channel also becomes deeper. Conversely, when the river stage declines, it first causes the navigable portion of the river to narrow, and then the water depth to decrease in the maintained channel. Narrower, shallower channels increase the risks to the river shipping industry by increasing the chances for traffic jams and incidents such as collisions, allisions, and groundings. The river shipping industry mitigates this risk by reducing the size of



Coast Guard Cutter *Gasconade* (rightmost ship) and its base during a 2012 flood. *Gasconade* normally moors near the buoys by the main building, which the crew kept dry with sandbags and pumps. U.S. Coast Guard photo.



Crews work to remove the rocky obstructions during the low water operations near Thebes, Ill., in 2012. Photo courtesy of the U.S. Army Corps of Engineers, St. Louis District-MVS, photo by Romanda Walker.

its tows or barge draft. Reduced tow size and draft come at the cost of a reduced cargo load, however, and that translates to higher costs for producers, shippers, and consumers.

In a 40-mile portion of the Mississippi River around Thebes, Illinois, risks of a low river stage are exacerbated by a rocky bottom, covered by stony pinnacles and boulders. If a tow boat or barge were to strike the bottom or a rock, the damage could be significant. Due to the drought, the river stage around Thebes was predicted to be much lower than normal during the winter of 2012, so what normally passed underneath the hull of a river barge might pass through the hull.

Safeguarding Commerce

To contend with this situation, the U.S. Coast Guard partnered with the U.S. Army Corps of Engineers and industry to clear the channel near Thebes of pinnacles and boulders, regulate traffic, and ensure safe navigation. To help mariners safely navigate, the Coast Guard deployed four river buoy tenders, frequently moving river buoys to

correspond with the extent of safe water. Those buoy tenders also supplemented the existing buoys with 125 additional ones to provide marking system redundancy.

The combined efforts of all participants prevented a complete shutdown of river traffic near Thebes during the low water event. Such a shutdown would have affected an estimated \$7 billion worth of cargo, 20,000 jobs, and \$130 million in wages.¹ Instead, participants averted the worst case, and more than \$5.5 billion in cargo made it through.²

These efforts were an important part of the third strategic priority in the Coast Guard's Western Hemisphere Strategy:

safeguarding commerce. The strategy cites three means to protect commerce:

- protecting lives;
- promoting a safe, secure, and resilient marine transportation system;
- preserving the marine environment.

The Aging ATON Fleet

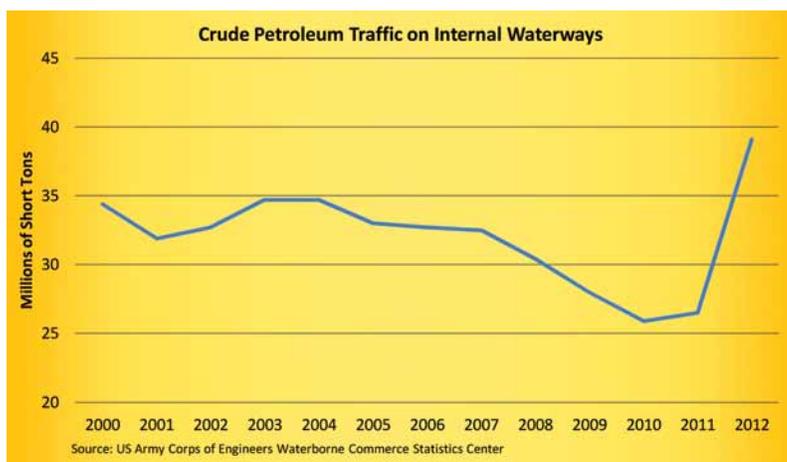
The Coast Guard inland aids to navigation (ATON) fleet plays an important yet unheralded role within the strategy by carrying out operations that support the marine transportation system and protect the environment.

The inland ATON fleet consists primarily of 35 cutters in three classes:

- construction tenders (WLIC),
- inland buoy tenders (WLI),
- river buoy tenders (WLR).

Their area of responsibility is the U.S. inland MTS, which is comprised of the inland rivers and the 12,000-mile-long Intracoastal Waterway. The Coast Guard Office of Visual Navigation estimates that 68.3 percent of the Coast Guard's 49,102 aids to navigation fall under the responsibility of a WLIC, WLI, or WLR cutter.

This enormous area of responsibility also looms large in its significance for the national economy. For example, 565 million tons of goods were shipped on internal waterways in 2012.³ Moreover, the Maritime Administration of the U.S. Department of Transportation estimates that 60 percent of grain exports, 22 percent of domestic petroleum products, and 20 percent



The Aging ATON Fleet

- The youngest river tender is 23 years old, just seven years shy of its designed service life.
- All but two river tenders are already past their designed service lives.
- Finding replacement parts for vessels up to 70 years old is often impossible, necessitating individually engineered parts.
- During the past 28 years, unbudgeted maintenance costs totaled almost \$15.5 million.
- Due to the maintenance needs of this aging fleet, the ships are unavailable 35 percent of the time.

of coal used in electricity generation are shipped along the inland waterways. All told, this cargo is worth around \$70 billion.⁴

Furthermore, an increasing amount of petroleum products are shipped on internal waterways, as a result of increased U.S. domestic oil and natural gas production—accounting for 201 million tons shipped in 2012. Crude petroleum shipments along internal waterways jumped 47.3 percent compared to the previous year.⁵ The U.S. Energy Information Administration reports that deliveries of domestic crude by barge have spiked within the past two years, especially along the Gulf Coast.⁶

Given the sheer amount of traffic on the inland waterways, its importance for the national economy and for regional and international economies, and the greatly increased movement on the waterway of products that could be hazardous to the environment, it is of paramount importance that the Coast Guard maintain its waterways presence to regulate and assist in their safe and efficient use.

Unfortunately, the Coast Guard's ability to maintain its current level of presence continues to decline, because of its aging inland fleet. For example, USCGC *Smilax* was built in 1944, and the newest tender is the 23-year-old USCGC *Greenbriar*—one of only two cutters that is not already past its designed service life.

The Cost of Obsolescence

As these ships age, their engineering, operational, and habitability equipment becomes obsolete, which leads to higher sustainment costs, as systems continually require replacement or repair. Unfortunately, piecemeal parts replacement across this 35-ship fleet means there is no standard configuration.

This, in turn, requires that any upgrades or changes the Coast Guard implements across the fleet must be individually engineered for each platform. This expense quickly adds up, particularly when repairs must be made under tight deadlines, as often becomes the case when failed equipment is discovered in the wake of a catastrophic system failure. Additionally, while completing this work, maintenance personnel frequently discover other failing systems to repair.

Such is the vicious cycle when your vessel is decades past its service life.

The Coast Guard's maintenance directorates establish for every platform an annual standard service level (SSL) that defines the annual projected maintenance costs for each class of ship.

The average actual sustainment costs were 226 percent, 325 percent, and 135 percent of the SSL for the WLICs, WLIs, and WLRs, respectively.⁷ Across this 35-ship fleet, during the past 28 years, maintenance costs have exceeded the SSL in 11 of them—totaling unbudgeted costs of almost \$15.5 million. Unforeseen hull plating replacement, abating hazardous materials discovered during maintenance, and delays in designing and fabricating replacement equipment during contracted maintenance availabilities, have driven much of these costs.

The Costs Add Up

However, the financial costs of this aging fleet tell only part of the story. Each of the WLRs and WLICs is resourced to complete between 1,200 and 1,400 hours of underway operations per year, and the WLIs are resourced for 825 hours. However, in 2013, these ships had an average operational percentage of time free of casualty (POTF) of 65 percent, with the 65-foot WLRs averaging only 46 percent. This means that in planned operational periods, the ships were unavailable 35 percent of the time.⁸ As a point of comparison, the 140-foot icebreaking tugs, with an average age of 33 years, were at 96 percent POTF in 2013.⁹

This also means that tenders are unavailable to provide on the scene presence and response in support of Coast Guard operational commander needs—particularly those necessary to facilitate commerce during contingency situations or to respond to emergencies. For example, the Coast Guard deployed four tenders to the Thebes low water operations. One cutter should have been able to perform the job, but four were necessary to maintain a constant presence, in anticipation of breakdowns.



A final “cost” takes into account the hazards to the crews who operate and maintain these aging cutters. A 2012 Coast Guard Health, Safety and Work-life Service Center study found asbestos-containing materials across 24 tenders or barges, resulting in six designated as having heightened risks of exposure. Likewise, the same study found that 12 cutters had lead exposure risk, based upon dust sourced in lead paint and installed lead ballast ingots.¹⁰ These chemical hazards exacerbate the daily challenges crews already face with antiquated berthing, messing, and sanitary facilities.

Additionally, outdated shipboard configurations virtually preclude any females being assigned to these cutters, which negatively affect diversity and the career opportunities so important to retaining qualified and dedicated personnel. The scope of these habitability concerns was a driving factor in the Western Rivers ATON Mission Analysis Report recommendation to recapitalize rather than refurbish the WLRs, WLIs, and WLICs.

Where Do We Go From Here?

With the current state of the inland fleet and the increased traffic on the waterways the vessels maintain, the impact of decreasing operational availability becomes even more acute. Despite sophisticated, modern navigation electronics and systems, nothing tells a mariner better than a buoy how the water is behaving and (provided it is on station), where hazards are. This is particularly true on the western rivers, as the buoys are constantly relocated in relation to the water level.

However, when a Coast Guard tender is not available due to an equipment failure, aid accuracy comes into question. Unreliable aids to navigation increases waterway transit risks and costs. If the buoys are not updated, or their locations are questionable, tow companies may pre-emptively reduce the number of barges in their tows and their drafts to manage grounding risk. Despite the reduced cargo, the amount of fuel it takes to push the tows remains mostly static, resulting in lost revenue for each waterway transit. One company recounted how reducing its tow’s draft by 6 inches, in direct response to a river tender being unable to relocate aids due to an equipment failure, resulted in \$552,000 of unrecovered costs.¹¹

In sum: The decreasing availability and increasing costs to maintain this 70-year-old fleet undermine the Coast Guard’s ability to provide this service to the mariner at the very time that the demand for reliable, effective ATON service along internal waterways is increasing.

Significant investment in the inland fleet must occur to halt the progression of this inverse relationship between service and demand. Without it, this forgotten fleet may cease to be a fleet at all.

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LT Dan Halsig manages the polar icebreaking fleet. He is a 2009 graduate of the U.S. Coast Guard Academy. He has served as a deck watch officer aboard USCGC Willow and as operations officer aboard USCGC Hickory.

Bibliography:

American Waterways Operators, and Waterways Council, Inc. *Mississippi River Low Water Level Economic Impact December 2012–January 2013*. 28 Nov. 2012. Web.

United States Coast Guard. *Coast Guard Publication 3-0: Operations*. February, 2012.

Endnotes:

- ¹ Arenstam, John, CAPT, USCG and CAPT Larry Hewett, USCG. *Western Rivers Operations Report – 2012-2013 Extreme Low Water*. 2013. Microsoft Word File.
- ² *Mississippi River Low Water Level Economic Impact December 2012–January 2013*. American Waterways Operators, and Waterways Council, Inc., November 2012. Available at http://waterwayscouncil.org/wp-content/uploads/2013/01/Water_Level_Economic-Impacts_11-28.pdf.
- ³ *Transportation Facts and Information*. Navigation and Civil Works Decision Support Center, U.S. Army Corps of Engineers, November 2013.
- ⁴ Woodruff, M. *Waterways: Working for America*. National Waterways Foundation, Kirby Corporation Inland Waterway Users Board, July 2008. A study by the Texas Transportation Institute, Texas A&M University. Available at www.iwr.usace.army.mil/Portals/70/docs/IWUB/board_meetings/meeting58/NWF%20Presentation%20for%20Users%20Board.pdf.
- ⁵ *Transportation Facts and Information*. Navigation and Civil Works Decision Support Center, U.S. Army Corps of Engineers, November 2013.
- ⁶ *Refinery Capacity Report*. United States Energy Information Administration, June 2013.
- ⁷ U.S. Coast Guard Office of Cutter Forces. *CCAMP WLI 65ft and 100ft* (Cutter Capital Asset Management Plan Data Card), p.p. 5-6; U.S. Coast Guard Office of Cutter Forces, *CCAMP WLR 65’ and 75’* (Cutter Capital Asset Management Plan Data Card), p.p. 6-7; US Coast Guard Office of Cutter Forces, *CCAMP WLIC 75’-100’-160’* (Cutter Capital Asset Management Plan Data Card), p.p. 6-8.
- ⁸ Sciuillo, A. (2014) *River Tender (WLR), Inland Construction Tender (WLIC) and Inland Buoy Tender (WLI) Recapitalization*. ADE brief, presentation, slide 24.
- ⁹ *140’ WTGB CCAMP* (Cutter Capital Asset Management Plan Data Card). Washington, DC: U.S. Coast Guard Office of Cutter Forces, p.p. 5-6.
- ¹⁰ *Asbestos/Lead Condition Assessment Project Final Report*. U.S. Coast Guard Health, Safety and Work-life Service Center, 2012.
- ¹¹ *Mission Analysis Report for Coast Guard Western Rivers Aids to Navigation Assets*. Alexandria, VA: Systems Planning and Analysis, Inc. Contracted report, 2008, p.p. 19-20.

Thinking Inside the Box

How containerized cargo impacts the global economy.

by LCDR DARWIN A. JENSEN
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LT MICHAEL ST. LOUIS
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The supply chain creates a secure environment for transnational shipping, while reducing cost and increasing efficiency. Prior to containerization, break-bulk vessels transported international goods across the seas, with cargo loose or in packed boxes, bags, barrels, or other relatively small containers.

Before containerization, underpaid dockworkers could easily pilfer cargo. It was also very costly to move cargo on and off break-bulk vessels, as it required significant time and effort for workers to stow boxes and arrange barrels in ships' holds.

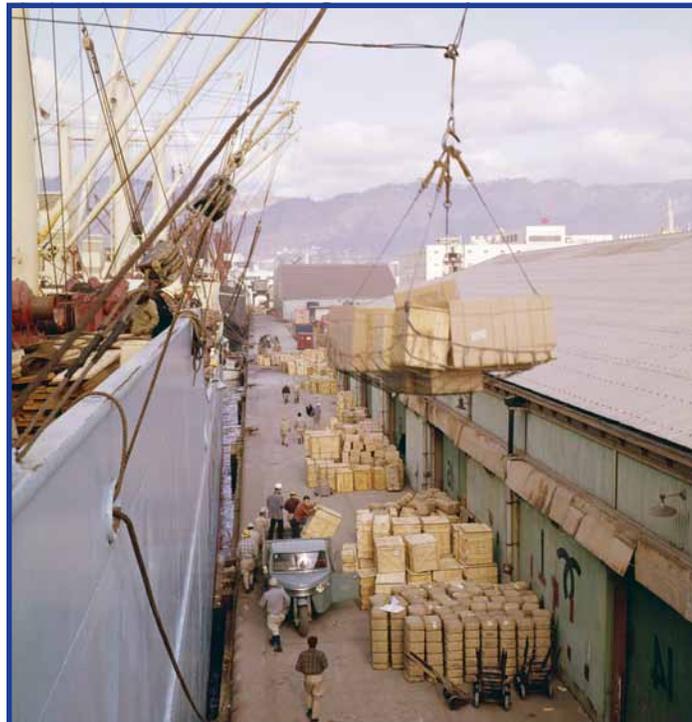


Photo courtesy of Maersk Global Service Centres Ltd., Group History Documentation archives.

Why Containers?

Although containerization did not immediately gain popularity, history has proven that shipping containers are the ideal solution, because they are strong enough to withstand intermodal transportation, storage, and handling stresses, and standardized sizes (typically 20-foot, 40-foot, 45-foot and 53-foot lengths) allow for easier shipping configurations.

Containerized cargo is measured by twenty-foot equivalent units (TEUs) equal to a 20-foot long by 8-foot wide container. With standardization, shipping containers can also move quickly from one mode of transport to another, while maintaining content integrity.

Container Ships

As shipping containers grow more popular, the vessels that carry them have also grown. The earliest container ships, made from converted World War II tank ships, could only carry 500 to 800 TEUs. But that changed in the 1970s, when newly constructed dedicated service containerships offered cargo capacity of 1,000 to 2,500 TEUs.

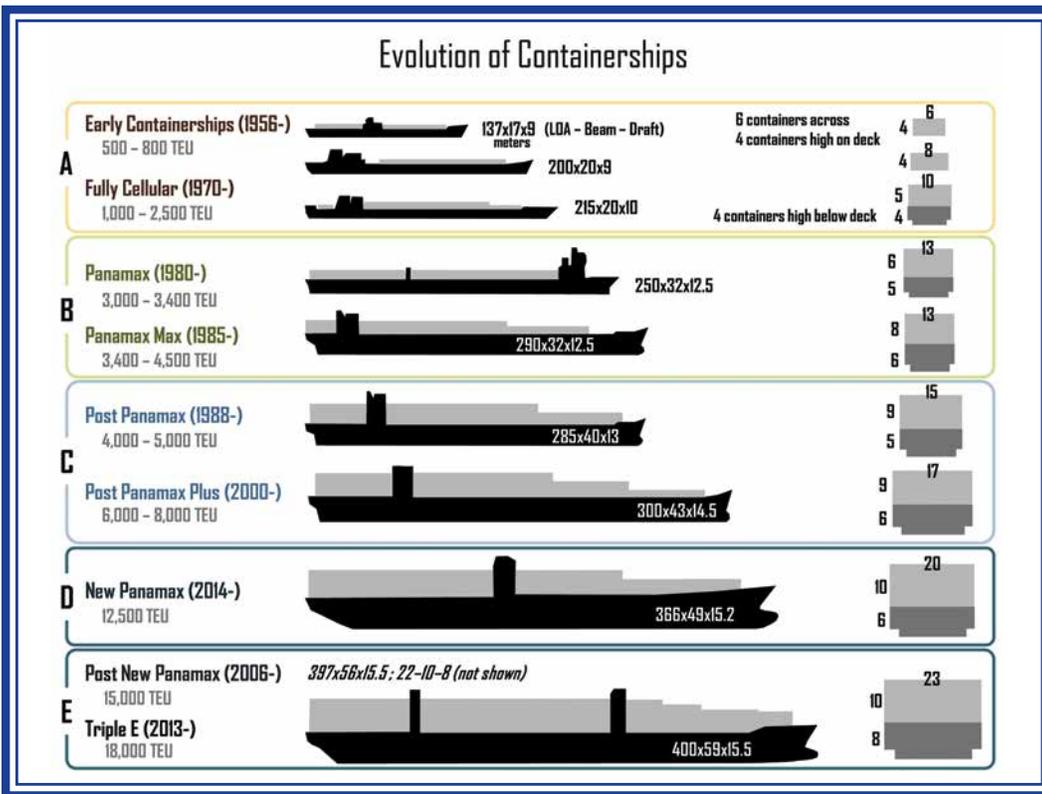
When is a Container Not a Container?

The expansion of the use of containers has proven to only be limited by the creativity of the shipping community.

Containers are being utilized to ship products that traditionally had been transported in bulk or break-bulk by modifying containers to accommodate fillable bladders to transport bulk liquids, installing temporary bulkheads to transfer grain, or retrofitting a protective liner into a container to safely transport fly ash.



Evolution of Containerships



Courtesy of Ashar and Rodrigue, 2012. *The Geography of Transport Systems*, 3rd Edition. The Sage Handbook of Transport Studies PortEconomics.eu. All dimensions are in meters. LOA: Length overall. Thanks to Jean-Paul Rodrigue, Ph.D., professor, Department of Global Studies & Geography, Hofstra University, New York.

Since then, vessel design and construction have evolved and recently culminated in the new Triple-E class containership. At 1,319 feet in length, with a beam of 194 feet, these vessels can carry more than 18,000 TEUs. To put the carry capacity of these vessels into perspective, the Triple-E can transport approximately 182 million iPads in a single voyage.¹

Shipping container versatility has created an expanding market, which saw growth from merely 1.5 million TEU in 1988 to more than 9.5 million TEU in 2011,² and is projected to see growth of about 80 percent gross domestic product in the U.S. for the next 25 years.³

International Trade

In 2007, the Panama Canal Authority announced its plan to accommodate larger container vessels by expanding its locks. As the Panama Canal is a key piece in the shipping industry supply chain—connecting 144 shipping routes—this expansion project is great news for shippers who carry larger loads. Today, the canal currently allows container vessels with capacity of no more than 4,400 TEU to transit through the Panamanian isthmus. However, once the project is completed, the load limit will increase to 12,000 TEU.

This is also good news for the Panama Canal Authority, as containers are the main commodity moved through the Panama Canal, and account for more than 50 percent

of toll revenue.⁴ The expansion project, originally stalled due to some funding issues, is today nearly three-quarters complete.⁵

Cargo Misdeclaration, Inaccurate Weight

Now for some bad news. The exponential increase in containerized cargo is not without incident. In recent years, the container shipping industry has grown concerned regarding the increase in incidents involving moving cargo by container. The two most prominent concerns:

- misdeclaration of dangerous goods,
- failure to disclose accurate cargo weight within the container.

For example, on June 18, 2013, a fire erupted in three containers on a vessel, causing damage to several surrounding containers. The fire originated in a container misdeclared (mislabeled) as household goods. Container fires can be particularly dangerous and very difficult to control, depending on the location of the container in the stack, or in the cargo hold, and intensified by the extreme high temperatures that can be reached inside the container.⁶

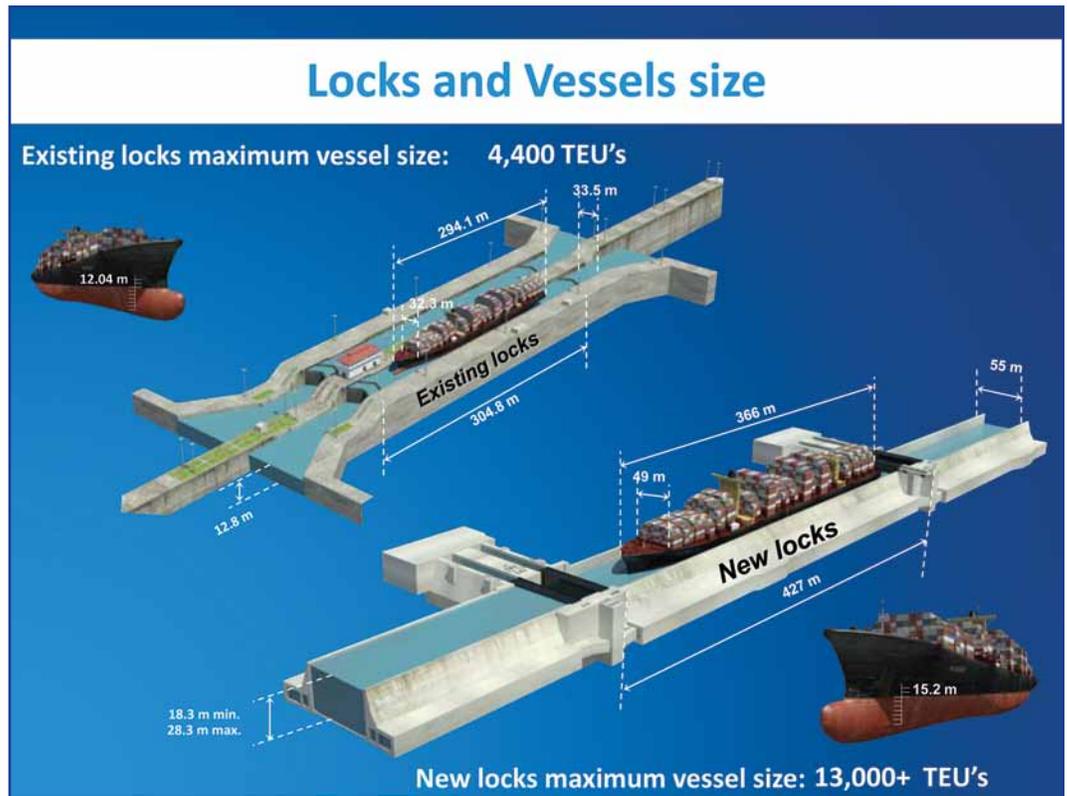
Another unfortunate example of the dangers that misdeclared cargo pose was the 2012 fire on a containership that completely destroyed the containers in the number 3 to 7 holds, forcing the crew to abandon ship and resulting in the death of three crew members when one of the containers exploded. The fire most likely originated in a container stowed below deck in a hold that contained misdeclared hazardous cargo that was not properly declared by the manufacturer nor stowed in accordance with manufacturer recommendations.⁷

Additionally, misdeclared container cargo weight has been a longstanding problem that presents safety hazards for ships, crews, other cargo onboard, and workers in the port facility.⁸ A paper submitted to the International Maritime Organization (IMO) notes several vessel and facility incidents during the last several years in which containers were found to have misdeclared weights.⁹ Although a misdeclared individual container by itself would not be sufficient to negatively

affect the stability or structural integrity of a container-ship, the compounding effects of these misdeclared cargoes cannot be ignored.

In January 2007, a vessel transiting the English Channel, suffered a structural failure in its hull, eventually causing the vessel to split in half. The Marine Accident Investigation Branch (of the UK's Department of Transport) conducted an investigation and found:

"The effect of the discrepancies in the declared weights of the containers would not have been sufficient to cause hull failure, but it would have contributed to the reduction of the safety margin between the total bending moment

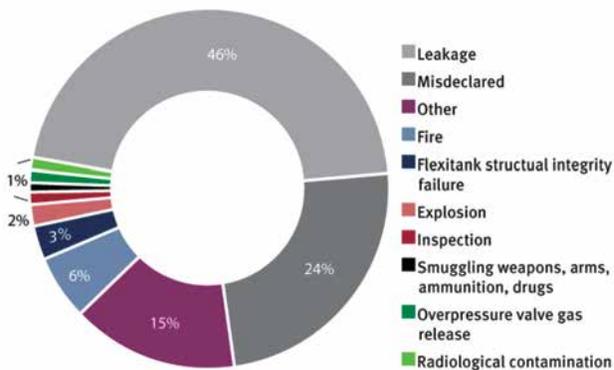


Comparison of existing Panama Canal locks and new Panama Canal locks. Courtesy of the Panama Canal Authority.

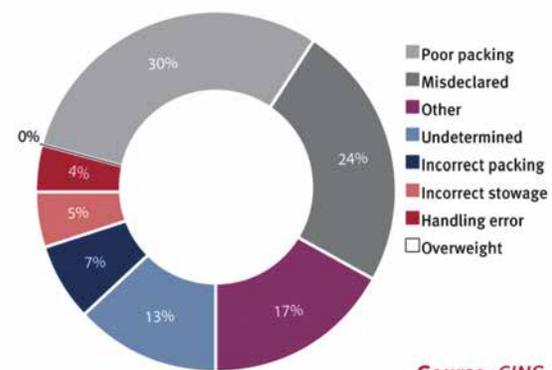
The Cargo Incident Notification System

The Cargo Incident Notification System (CINS) network, created in mid-2011 to compile data covering cargo-related incidents within its membership, establishes areas of concern and trends to improve safety in the transport chain.

ANALYSIS BY INCIDENT TYPE



ANALYSIS BY POTENTIAL CAUSE



Source: CINS

Graphics courtesy of Janet Porter/Lloyds List and the Container Owners Association.

Its latest data on potential incident cause analysis shows that poor packaging accounted for 30 percent of incidents, followed by 24 percent for misdeclarations. In a statement following the CINS Taipei meeting, the group determined that 24 percent of the cases involved misdeclared cargo, mostly comprised of dangerous goods.¹

Endnote:

¹ Porter, J. (2013, June 21). *Eugen Maersk fire revives concerns about misdeclared cargo*. Retrieved from Lloyd's Loading List.com.

experienced and the strength of the hull. ..." Moreover, "The stresses acting upon a container ship's hull cannot be accurately controlled unless containers are weighed before embarkation."¹⁰

What Is Being Done to Address These Issues?

The IMO is considering a draft of the IMO/ILO/UNECE Code of Practice for Packing of Cargo Transport Units, which would revise the IMO/ILO/UNECE Guidelines for Packing of Cargo Transport Units and solidify international standards for packing containers. The paper specifically addresses mandatory verification of container gross weight. This should have a major impact on compliance with existing international standards for shipping.

Within the U.S., the National Cargo Bureau (NCB) Inc. has identified potential issues with containerized cargo and has done several things to help mitigate these issues. For example, inspectors within NCB conduct containerized cargo inspection to ensure compliance with proper marking, placarding, blocking, bracing, container serviceability, and proper documentation. These inspections also include detecting undeclared cargo.

NCB also reviews hazardous material/dangerous cargo manifests for compliance, including proper storage and segregation, and assists in investigations of incidents involving container storage and packing. NCB also offers training to the maritime industry regarding the International Maritime Dangerous Goods Code, the U.S. Code of Federal Regulations compliance, vessel storage and segregation compliance for terminals and carriers, and USCG approved self-study courses.

In 2012, NCB personnel inspected approximately 28,000 containers carrying dangerous goods and 2,757 were found with deficiencies.¹¹ By comparison, Coast Guard personnel inspected 25,645 containers finding 2,434 deficiencies.

Most recently, the U.S. Coast Guard updated its National Container Inspection Program guidance to address misdeclared cargo concerns and emphasized the importance of developing cooperative working relationship with terminal operators and other government agencies to ensure container safety. Previously, the Coast Guard had focused container inspection efforts on containers transporting hazardous material cargoes, but recent incidents involving

misdeclared cargo have created a need to shift the focus of inspections to screen containers carrying general cargo to help determine where the greatest potential exists for preventing future containership incidents.

In the current environment of an ever-expanding global economy and the increasing popularity of containerized cargo, it is imperative that the international shipping industry and regulatory agencies make every effort to develop policies and best practices to address the growing concerns associated with containerized cargo to ensure the safety and security of the supply chain.

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Endnotes:

1. Maersk Group. (n.d.). *Introducing the Triple-E*. Retrieved 2014, from Worlds Largest Ship. Available at www.worldslargestship.com/.
2. *The containership market in 2007*. BRS-Alphaliner Annual Report, 2007. Available at www.alphaliner.com/liner2/research_files/liner_studies/misc/Annual%20Report%202007.pdf.
3. Transportation Research Board. (2013). *Critical issues in transportation—2013*. National Academy of Sciences, Transportation Research Board of the National Academies, Washington, DC.
4. Dengo, M. (2012). *The Panama Canal expansion and its impact on the world*. Port Technology International, 53rd Edition (Spring—2012), 12-13. Available at www.port-technology.org/.
5. Molinski, D. *Work Resumes on Panama Canal Expansion*. New York, NY: The Wall Street Journal, February 2014. Available at <http://online.wsj.com/news/articles/SB10001424052702304914204579394631717914294>.
6. Hand, M. (September 2013). *A burning issue: boxship fires and overweight containers*. Retrieved from Seatrade Global: www.seatrade-global.com/news/asia/a-burning-issue-boxship-fires-and-overweight-containers.html.
7. Federal Bureau of Maritime Casualty Investigation, 2014.
8. Shipping Industry Joint Release on DSC 18. (2013, September 4). *Shipping industry urges the IMO to approve container weight verification requirement*. Retrieved from [iaphworldports.org](http://www.iaphworldports.org) at www.iaphworldports.org/LinkClick.aspx?fileticket=qowkCGw6-uA%3D&tabid=5115.
9. IMO submission from various governments and industry organizations. (2012, July 27). *Development of measures to prevent loss of containers*. Retrieved from [worldshipping.org](http://www.worldshipping.org): www.worldshipping.org/industry-issues/safety/Verification_of_container_weights_DSC_17-INF_5_-_Examples.pdf.
10. Marine Accident Investigation Branch. (2008). *Report on Investigation of the structural failure of MSC Napoli English Channel on 18 January 2007*. Southampton, UK.
11. Darwin Jensen's interview with Robert Albhorn, vice president of liner activities, National Cargo Bureau, March 17, 2014.



The Caribbean Basin Security Initiative

Strengthening regional cooperation to reduce illicit trafficking.

by AMBASSADOR LUIS E. ARREAGA
*Deputy Assistant Secretary of State
Bureau of International Narcotics and Law Enforcement Affairs*

Emerging drug trafficking trends in the Caribbean region show that the amount of cocaine from South America transiting the Caribbean has increased from 5 percent in 2011 to 16 percent in 2013,¹ most likely due to successful counter-drug efforts elsewhere in the hemisphere. For example, in 2000, when Plan Colombia² began to apply pressure on the drug trafficking organizations in Colombia, the drug nexus began to shift to Mexico.

In 2007, as we enhanced cooperative efforts with the Mexican government to increase pressure on the cartels in Mexico, they began to relocate to Central America. When Central American governments, in partnership with the United States, increased their capacity to interdict illicit trafficking in their territories and littoral areas, it was not a stretch to foresee the cartels would react by reviving their old Caribbean routes, and we are already seeing evidence of this.

Caribbean Shift

Caribbean crime rates are high and drug trafficking is on the rise. While improved data collection and regional information sharing between Caribbean partners and the United States have contributed to the elevated numbers of seizures as well, the overall rise in crime and violence is still measurable.

Ironically, this comes at a time when demand-reduction efforts in the United States have shown success during the past decade. Investments in prevention and education, together with smarter law enforcement, are producing positive results and U.S. cocaine consumption is down by 40 percent since 2006.³

While we must address drug supply and demand issues, the argument that no problem would exist if the U.S. consumer market disappeared is a fallacy. The “balloon effect”⁴ would still be in play, as different drugs, different routes (to Europe and Asia), and different types of criminal activities become part of the equation.

The Caribbean Basin Security Initiative

Fortunately, we know how to respond to this emerging crisis in the Caribbean. The Caribbean Basin Security



The crew of a Coast Guard cutter transfers custody of a cocaine shipment to Drug Enforcement Administration special agents and Customs and Border Protection officers following an at-sea interdiction. U.S. Coast Guard photo by Ricardo Castrodad.

Initiative (CBSI) is a partnership among the United States and 13 Caribbean nations that takes a collaborative approach to address citizen safety and encourage regional cooperation. Partners work together to:

- substantially reduce illicit trafficking,
- increase public safety and security,
- promote social justice.

The CBSI emphasizes strengthening regional cooperation within the region, rather than having single Caribbean countries try to address the criminal and trafficking threats on their own.

To that end, we are providing critical law enforcement tools such as Automated Fingerprint Identification System (AFIS) equipment to share fingerprint data throughout the region. To date, the AFIS network is operational in 10 countries and we expect all 13 CBSI countries will be linked by the end of 2014. And, it is having an impact; for example, the Grenada Royal Police Force reported approximately 50 percent of its cold cases were cleared through AFIS hits in the new digitized record system.

The Regional Integrated Ballistics Imaging Network (RIBIN) is another important tool to share ballistics data. In partnership with the Canadian government, we have established three RIBIN “hubs,” capable of analyzing and sharing digital images of cartridges collected at crime scenes in Barbados, Jamaica, and Trinidad and Tobago. We are also creating a Web-based virtual training network, linking police academies in the region to produce and share training content, techniques, and experiences.

Additionally, we work with several U.S. government and international agencies to carry out CBSI and develop an innovative mix of programs that combine fresh thinking with what we know has worked in the past. One of the most



Two response boats deploy for an exercise, after being offloaded from the deck of the U.S. Army Vessel *New Orleans*. U.S. Coast Guard photo by Petty Officer Rob Simpson.

creative programs involves collaboration among the Department of State’s Bureau of International Narcotics and Law Enforcement Affairs, the Bureau of Political Military Affairs, and the U.S. Coast Guard to improve Caribbean governments’ capacity to conduct maritime interdiction operations.

Maritime Interdiction

The program consists of three components:

- the CBSI regional technical assistance field team (TAFT),
- the Tradewinds exercise,
- the Multilateral Maritime and Interdiction and Prosecution Summit.

The Caribbean Basin Security Initiative regional TAFT is a 15-person team, consisting of half U.S. Coast Guard and half U.S. Army experts, focused on establishing maintenance and logistics systems throughout CBSI partner nations to improve operational readiness with existing assets, as a more efficient alternative to buying new ones. If the CBSI regional technical assistance field team approach proves successful, it could transform how we support maritime interdiction all around the hemisphere, not just in the Caribbean.

The Tradewinds exercise brings together Caribbean police and defense force partners to exercise regional information sharing networks, improve maritime interdiction coordination, develop regional training capacity, and improve asset maintenance practices. Scheduled to take place annually, the 10-day event links the TAFT-supported boats provided via the Department of Defense’s Secure Seas program and the regional operational plans and strategies the Caribbean Multilateral Maritime and Interdiction and Prosecution Summit developed through tactical and scenario-based exercises.

For example, the Multilateral Maritime and Interdiction and Prosecution Summit provides our Caribbean partners a forum to deal with organized criminal networks operating in the maritime commons and combines prosecutorial and judicial capacity to promote effective collaboration between law enforcement and judicial authorities. So the criminal justice aspect of maritime interdiction and security, often neglected in the past, will now receive the attention it deserves.

Container Security

Because Caribbean drug trafficking is primarily a maritime enterprise, we support port security in general and container security in particular, via the United Nations Office on Drug and Crimes’ innovative Container Control Programme in the Dominican Republic, Guyana, Jamaica, and Suriname.

The program establishes interagency container profiling units composed of customs and other relevant law enforcement officers who participate in port operations. Multi-agency profiling units are effective weapons against corruption, because no single agency has complete control of port operations, which makes it harder to reveal illegal activity. Capacity-building assistance includes training profiling unit personnel to detect, identify, and inspect high-risk containers by using risk analysis and modern profiling techniques.

Asset Forfeiture

Caribbean officials often point out that they cannot afford to modernize their criminal justice systems due to limited budgets. In response, we are promoting civil asset forfeiture to target transnational criminal organization wealth. In the Eastern Caribbean, our financial crimes adviser has drafted model legislation that includes a dedicated forfeiture fund and an asset-sharing protocol so that seized assets are invested in law enforcement institutions.

We are also collaborating with the U.S. Department of Treasury's Office of Technical Assistance to aggressively implement existing anti-money-laundering laws. Office of Technical Assistance mentors provide guidance to manage seized assets and investigate and prosecute complex financial crimes. The Department of State's Bureau of International Narcotics and Law Enforcement Affairs (INL) also partners with the Department of Justice and the United Kingdom's Crown Prosecution Service to strengthen law enforcement efforts, promote justice sector development, and enforce the rule of law.

Evolving Efforts

Just as drug trafficking trends shift constantly, so do trafficker tactics. We need to be as flexible as the traffickers and take advantage of law enforcement and judicial expertise at federal, state, and local levels.

Therefore, during the past three years, INL has developed partnerships with more than 60 U.S. state, county, and local law enforcement, corrections, and judicial offices. These partnerships have been mutually beneficial. For example,

the State Department and our overseas partners benefit from the unique skill sets, knowledge, and expertise of active-duty public safety professionals, and our domestic partners have expanded their ties to countries with which their communities have links.

Our newest partnership with PortMiami is also our first partnership with a U.S. port.⁵ In February 2014, a delegation of 20 port security officials from the Bahamas and Trinidad and Tobago participated in a study tour. During that week, PortMiami officials from the Miami-Dade Police Department, the U.S. Coast Guard, Customs and Border Protection, and the Federal Bureau of Investigations provided presentations in operational settings throughout the port. We are now looking at follow-on activities and will continue to build these relationships.

Future Focus

There are no easy fixes to the challenges the Caribbean nations face. CCSI seeks to address the many facets of this program holistically and engages a wide range of partners to do so. We will continue to evaluate, adapt, innovate, and strengthen programs in concert with partners, building on the synergies that can and will improve security throughout the region.

About the author:

As deputy assistant secretary of state for the Bureau of International Narcotics and Law Enforcement Affairs, Ambassador Louis E. Arreaga is responsible for State Department programs combating illicit drugs and organized crime and supporting law enforcement and rule of law in the Western Hemisphere. He served as United States Ambassador to the Republic of Iceland from 2010–13.

Endnotes:

- ¹ See prepared remarks by INL Deputy Assistant Secretary of State Luis E. Arreaga before the House Foreign Affairs Subcommittee on the Western Hemisphere, April 29, 2014 at <http://transportation.house.gov/uploadedfiles/2014-04-29-arreaga.pdf>.
- ² Available at U.S. Embassy Bogota's website: <http://bogota.usembassy.gov/plancolumbia.html>.
- ³ See ONDCP report on worldwide cocaine trends at www.whitehouse.gov/ondcp/news-releases/survey-shows-significant-drop-in-cocaine-production.
- ⁴ The potential increase in the flow of narcotics and transnational security threats in the Caribbean is well documented in this congressional report at www.feinstein.senate.gov/public/index.cfm/files/serve/?File_id=90bb66bc-3371-4898-8415-fbfc31c0ed24.
- ⁵ See www.miamidade.gov/portmiami.



Joint Interagency Task Force South

Combating illicit drug operations.

by CAPTAIN JOSEPH PERRY
U.S. Army
Command Duty Officer
Joint Interagency Task Force South

LT CORY RIESTERER
U.S. Coast Guard
Operational Targeting Division
Joint Interagency Task Force South

In Key West, Fla., next to the crumbling ruins of a fortress from a different era, sits a modern-day complex designed to counter illicit drugs, a menace that threatens to destabilize the Western Hemisphere. For decades, the flow of illicit drugs from South America into the United States has been a consistent threat to regional stability in the Western Hemisphere, as many small, relatively poor countries in South and Central America lack the resources to effectively counter drug trafficking organizations and their influence.

Fortunately, the U.S. can assist foreign governments through the Joint Interagency Task Force South (JIATFS), a dynamic, modern-day effort in multi-agency operations that collaborates with foreign governments to help secure and stabilize their countries and the region. JIATFS, which falls under U.S. Southern Command's tasking authority,¹ also stands as the premier example for international and interagency partnerships in the Western Hemisphere.

JIATFS operates as a national task force; therefore, it is not part of any specific department or agency. Additionally, although the vast majority of JIATFS operations occur in U.S. Southern Command's area of responsibility, the JIATFS joint operating area (JOA) covers portions of four other combatant command's areas of responsibility, so Joint Interagency Task Force South also maintains working relationships with U.S. Northern, Pacific, African, and European Commands.

While these relationships may seem complicated, they allow Joint Interagency Task Force South to detect and monitor

illicit trafficking across domains and facilitate international and interagency interdiction to disrupt and dismantle illicit and converging threat networks.

Multinational Partnerships

Joint Interagency Task Force South serves as a tenant for international liaison officers from 14 different countries, each representing their respective country's military or law enforcement agencies. Foreign liaison officers provide timely information to and from national leaders inside the JIATFS joint operating area and coordinate intelligence sharing and operational planning at the strategic level.

Foreign flag-level officers also head two JIATFS task groups. Fostering these relationships and command structures allows foreign flag officers tactical control of U.S. and foreign assets, while executing Joint Interagency Task Force South's mission in specific sections of the JOA and furthering international coordination. Daily foreign liaison officer interaction among their colleagues and with the U.S. government is crucial to JIATFS success, because these officers share ideas and assets that help fight drug trafficking organizations.

The Joint Operations Center

Within the JIATFS joint operations center, watch standers from all five U.S. military branches monitor operations to counter illicit trafficking and maintain critical information-sharing links, ranging from "U.S.-only" networks to

continued on page 50

Partnership in Action

As one approaches the Joint Inter-agency Task Force South entrance, multinational partnerships are easy to identify, as the American flag stands in the center, surrounded by the flags of the 14 partner nations represented within the building.¹

All five U.S. military services are represented on the command board, and the structure illustrates that the organization's wide-ranging military and law enforcement integration starts at the very top. For example, the JIATFS director is a U.S. Coast Guard admiral

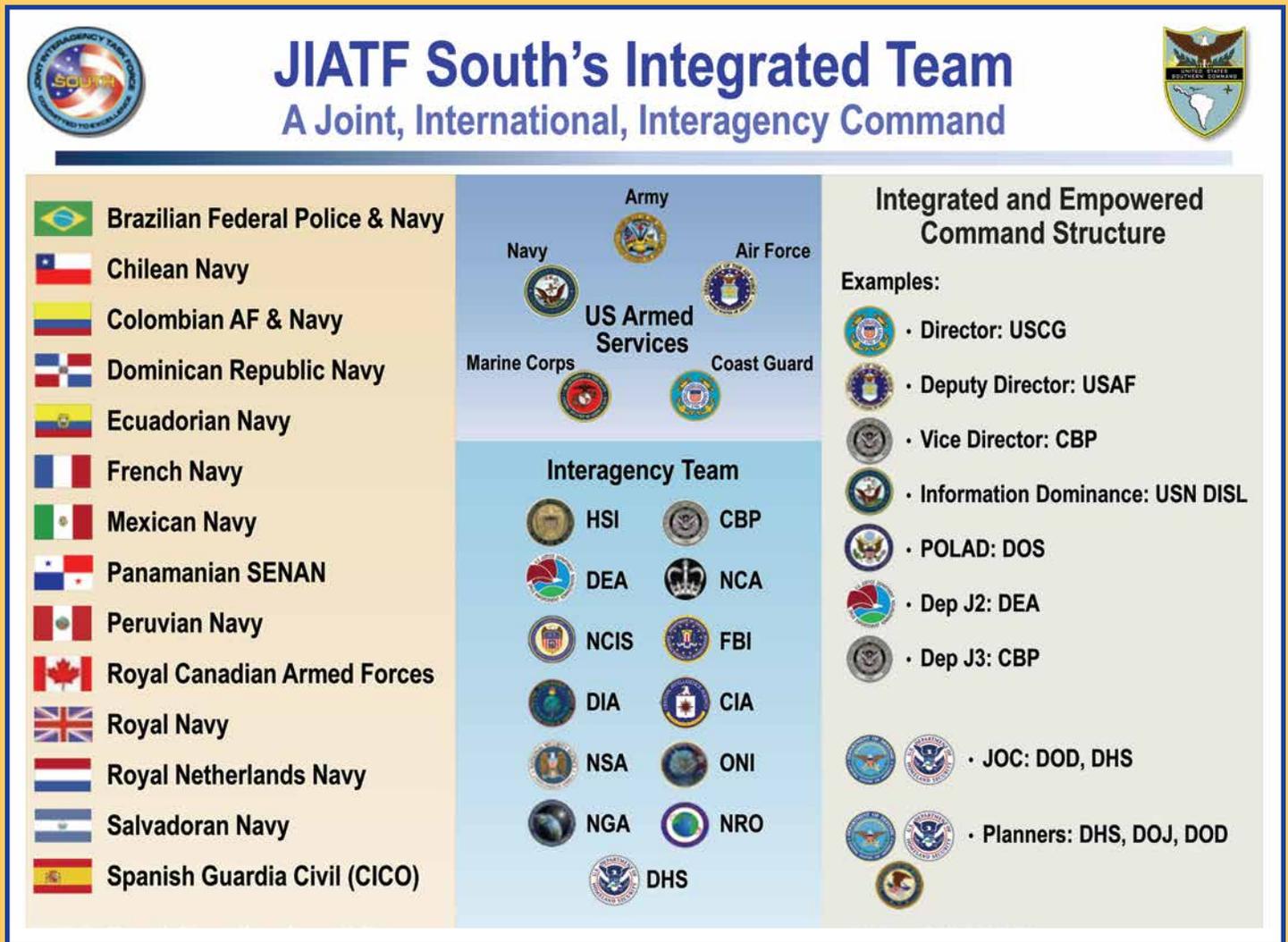
and the deputy director is a U.S. Air Force general. Members of the rest of the military services serve as directorate heads or deputies. U.S. inter-agency leaders include a U.S. Customs and Border Protection executive vice director and a U.S. Drug Enforcement Administration deputy director of Intelligence.

The Department of Homeland Security provides the majority of assets under JIATFS tactical control. In addition to these U.S. Coast Guard cutters and aircraft and U.S. Customs and Border

Protection aircraft, various Department of Defense components contribute additional resources, including U.S. Navy surface assets and U.S. Air Force air resources. Additionally, Army South and Marine Corps South provide operational support.

Endnote:

¹The countries partnered with the U.S. in JIATF South are Brazil, Canada, Chile, Columbia, the Dominican Republic, Ecuador, El Salvador, France, Mexico, Panama, Peru, the Netherlands, Spain, and the United Kingdom.



JIATFS boasts a variety of joint, interagency, and international partners. Graphic courtesy of JIATFS.



A Day in the Life

During a routine aerial maritime patrol, a Customs and Border Protection (CBP) aircraft detected a drug-laden “go-fast” paralleling the Panamanian coast, coming out of Colombia. A few miles ahead, a U.S. Navy frigate with an embarked USCG law enforcement detachment patrolled under JIATFS tactical control.

CBP aircraft personnel notified the U.S. frigate of the approaching go-fast and assisted in vectoring in the vessel. Upon detecting the U.S. Navy frigate, the go-fast crew jettisoned their payload of cocaine and headed back toward Colombia in hopes of evading law enforcement.

Aircraft personnel then directed the frigate to the debris field, while tracking the target’s progress back toward Colombia. Back at the JIATFS joint operations center, watch standers reached out to the Colombian Navy, which had a vessel stationed along the go-fast’s new route, and requested assistance.

CBP maritime patrol aircraft crew then communicated to the Colombian Navy frigate and vectored it onto the target. The Colombian vessel crew deployed its helicopter and small boat, whose crew interdicted and detained those aboard the go-fast.

unclassified, direct data and voice links to partner nation operations centers. A joint military/civilian team tracks the current intelligence picture while interagency liaison officers monitor specialized assets.

Additionally, the foreign liaison officers observe events inside their respective country’s territory or involving their country’s assets and report any useful information to the JIATFS joint operations center and their countries’ operations centers.

A robust, cooperative information exchange system among nations allows users to:

- share a common operating picture throughout the JOA,
- utilize a chat program that contains an embedded translation matrix to facilitate near real-time exchange of information,
- access a shared information exchange to enable cooperative and dynamic planning on multinational efforts to counter illicit trafficking organizations.

International “communication cards” delineate frequencies and call-signs for local assets to enable tactical communication. This allows U.S. aircraft and vessels to communicate with a partner nation’s assets to create an effective targeting process.

This arrangement allows the JIATFS joint operations center command duty officer immediate access to subject matter experts during an operation and aids the interactive efforts to interdict or disrupt illicit trafficking. All of these efforts improve our partner nations’ sovereign territory security.

The Intelligence Directorate

A dozen U.S. intelligence and law enforcement agencies and international partners work in the intelligence directorate to inform these efforts.² Staffers consolidate intelligence from a variety of sources to form the most complete picture of illicit movements, then disseminate it to operational partners to effect interdiction. The physical presence of all these organizations under a single command structure allows increased face-to-face interaction and expedited information fusion to create more complete domain awareness.



A U.S. Coast Guard helicopter crew fires warning shots at a go-fast vessel suspected of narcotics smuggling. U.S. Coast Guard photo.



U.S. Coast Guard law enforcement detachment members deployed aboard a British ship board a go-fast vessel. Photo courtesy of the Royal Navy, Crown copyright 2013. Photo by Leading Airman Stuart Hill, Royal Navy.

Outside of the physical command building, tactical analysis teams in 21 different countries consolidate and process intelligence. They maintain direct lines of communication with their respective host country's law enforcement or military response forces, which is crucial to facilitate the partner nation's response during real-time counter narcotics operations.

Looking Ahead

Joint Interagency Task Force South collaborates with foreign and domestic government agencies and organizations to fight illicit drug trafficking. This paradigm, in which JIATFS shares information and includes personnel from various organizations and nations, has achieved mutual trust, built-in interoperability, and successful operations. Hopefully, this model can be replicated or extended under the current command structure to thwart other common threats or address goals that further U.S. and international interests.

About the authors:

Captain Joseph Perry is a Joint Interagency Task Force South command duty officer. He is a 2005 graduate of the U.S. Military Academy, and he served as a company commander at Fort Bliss, Texas.

LT Cory Riesterer is assigned to the Joint Interagency Task Force South Operational Targeting Division. He is a 2005 graduate of the U.S. Coast Guard Academy, and he served aboard three cutters, including a tour as a patrol boat commanding officer.

Endnotes:

- ¹ U.S. Southern Command is one of nine unified combatant commands in the Department of Defense, responsible for contingency planning, operations, and security cooperation in its area of responsibility, which includes Central America, South America, and the Caribbean (except U.S. commonwealths, territories, and possessions). The command is also responsible for the force protection of U.S. military resources at these locations and for ensuring the defense of the Panama Canal.
- ² Homeland Security Investigations, Customs and Border Protection, Drug Enforcement Administration, Naval Criminal Investigative Service, Federal Bureau of Investigation, Defense Intelligence Agency, Central Intelligence Agency, National Security Agency, Office of Naval Intelligence, National Geospatial-Intelligence Agency, National Reconnaissance Office, Department of Homeland Security, National Crime Agency (UK).

Future SAR

Evolving search and rescue improvements.

by LCDR JAMES O'MARA

U.S. Coast Guard Office of Performance Management and Assessment

The Coast Guard is responsible for organizing search and rescue (SAR) facilities and operations across all navigable waters subject to U.S. jurisdiction and international waters stretching far into the Atlantic and Pacific Oceans and the Gulf of Mexico.

Coordinating SAR operations across such a vast area of responsibility is an enormous task and, when coupled with an inherently dynamic maritime environment, the Coast Guard is constantly challenged to sustain mission excellence. Looking forward, the public will expect the Coast Guard to not merely maintain current levels of service, but also to improve SAR effectiveness.

On the Horizon

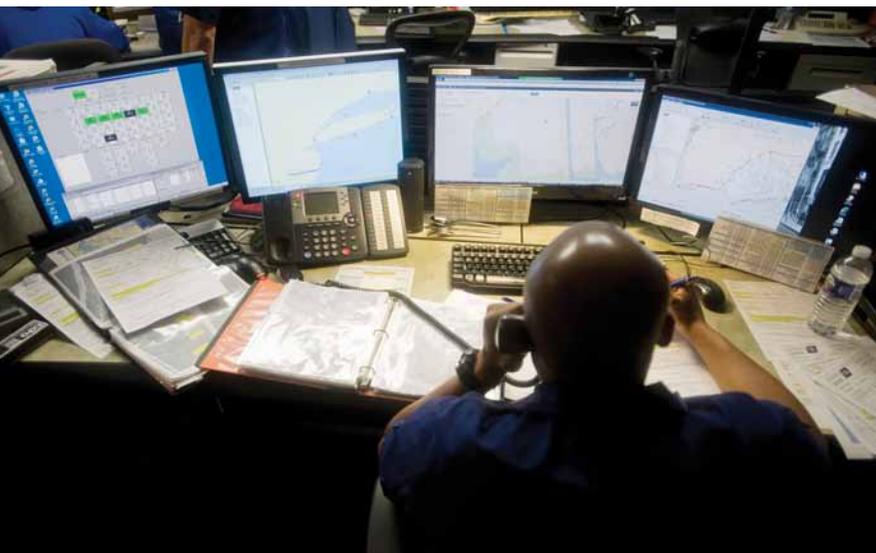
During the next 10 to 20 years, we will see exciting opportunities to refine existing capabilities and leverage new technologies to improve SAR operational effectiveness and

provide the most cost-effective service to the American public. For example:

- The Coast Guard's SAR planning tool, the Search and Rescue Optimization Planning System (SAROPS), will soon be able to create patterns that account for robust sensor and detection capabilities on response assets, to help crews find victims more effectively and efficiently.
- The Rescue 21 system, a VHF radio distress safety net for mariners, will be expanded and recapitalized to maintain maritime domain awareness, distress monitoring, and communications at least 20 miles off the coast.
- Faster and more capable SAR response assets will create flexibility for the Coast Guard to re-evaluate its station infrastructure footprint, while providing SAR coverage more efficiently.
- Unmanned aerial systems are already being incorporated into offshore law enforcement operations, and this type of asset may end up being a game-changer for SAR concepts of operation as well.

Even with these improvements, some challenges will remain. For example, larger conveyances are moving more people on the sea, more underwater commercial drilling activities are expected in the offshore energy sector, and new commercial and recreation sub-surface activities may gain popularity.

In the Arctic, new opportunities are opening and have already increased commercial and recreational maritime transits. Populations are shifting toward the water too. As more people gather near coastal regions, rivers, lakes, and popular bay/port cities, maritime traffic increases the potential for SAR cases. Similarly, the consequences imposed by natural disasters, such as hurricanes or flooding, tend to be exacerbated in these more densely populated areas..



A Sector New York command center watch stander answers calls during Hurricane Sandy to coordinate search and rescue cases. U.S. Coast Guard photo by Petty Officer Erik Swanson.

Hurricanes Katrina, Rita, and Sandy, as well as seasonal and unexpected floods along large rivers, all serve as constant reminders about the need to maintain robust maritime SAR response capabilities.

Additionally, we focus on robust marine safety programs that prevent many SAR cases from occurring in the first place. The Coast Guard will continue to coordinate and leverage these programs stressing boating safety, operator education, vessel safety regulations and inspections, and professional licensing and carriage requirements for safety and survival equipment. Every year these initiatives educate thousands of mariners about safety and preparedness and remain key parts of a broader strategy to prevent and mitigate marine incidents.

While nobody has a crystal ball to predict the exact number of future search and rescue cases, the factors cited are among the many that Coast Guard program and capabilities managers use to inform and prepare for future SAR missions.

Ongoing Improvements

With any search and rescue case, time is always of the essence—the sooner the Coast Guard is notified of distress, the sooner SAR coordinators can maximize search efforts to save lives. Moving forward, we will continue to update existing capabilities and develop new initiatives to transform future SAR operations.

Expanding maritime domain awareness: Rescue 21 is the Coast Guard's advanced direction-finding communications system, created to locate mariners in distress, with coverage at least 20 nautical miles offshore and along navigable rivers.

Rescue 21 is operational along the Atlantic, Pacific, and Gulf Coasts; the shores of the Great Lakes; and off Hawaii, Puerto Rico, the U.S. Virgin Islands, Guam, and the Northern Marianas Islands. Plans are also underway to adapt Rescue 21 capabilities to the unique operating environments of Alaska and the inland rivers.

Besides networking to provide better location and detection capability, the Office of Command, Control, Communications, Computers and Sensors Capabilities is also developing plans for Rescue 21 mid-life recapitalization. Updates include new radios, direction-finding processors, and other critical components.

Improving SAR planning: The Search and Rescue Optimal Planning System takes input about search objects,



A Coast Guard response boat on the Potomac River passes by the Washington Monument during a capabilities demonstration. U.S. Coast Guard photo by Petty Officer Adam Eggers.

environmental data, and available search facilities, and then uses thousands of simulated search objects to represent likely scenarios and determine the most promising areas to search. Based on the available resources, SAROPS recommends optimal search patterns that maximize the probability of finding the search object.

SAROPS improvements include:

- *Survivability and environmental information:* Every minute spent searching is another minute that victims are in distress, exposed to the elements. As time goes on, the likelihood of survival decreases, and the variation of how the object might drift increases. The U.S. Army Research Institute for Environmental Medicine's probability of survival decision aid software is currently available as a link on the desktop alongside SAROPS. Plans for the next SAROPS iteration include automatically incorporating this information.

Similarly, although SAROPS includes environmental data, planners are currently limited to selecting one source for estimating search object drift. Future SAROPS improvements may include aggregating or ensemble averaging¹ the environmental data sources most relevant to the specified area of interest and time period.

These improvements to SAROPS modeling will allow search planners to target search areas with higher confidence.

- *Optimizing radar and electro-optical sensors:* Coast Guard assets are equipped with robust sensors for SAR operations, but SAROPS search patterns currently do not account for these detection capabilities. As a result,



A Coast Guard Cutter *Stratton* crewmember releases an unmanned aerial surveillance aircraft during a demonstration. U.S. Coast Guard photo by Petty Officer Luke Clayton.

SAROPS search patterns default to narrower track spacing based on visual detection range. The resultant search patterns are more conservative and increase the time and number of sorties required to search an area, which also increases resource expenditure and operational risk.

Fortunately, USCG Research and Development Center personnel have worked on these issues for the past several years and have developed lateral range curve data for fixed-wing aircraft radars. The next step is to incorporate those parameters into SAROPS. Looking ahead, we will soon acquire a small fleet of C27 fixed-wing aircraft.² These assets will be outfitted with search capabilities, and the Coast Guard may be able to shorten the acquisition cycle, sensor testing, and SAROPS incorporation.

Center staff members are also validating the electro-optical infrared sensor system onboard the MH-60T and MH-65D helicopters to develop lateral range curves and sweep widths for the thermal imager against typical search objects in a variety of environmental conditions.

All of these R&D efforts will help the Coast Guard find mariners in distress in less time, increase the probability of mission success, and reduce search expenditures.

Enhanced SAR operations: Recent acquisitions are already changing search and rescue operations and certain evolving technologies may present game-changing opportunities for the future.

- *29-foot Freedom Class (RB-S II):* The new RB-S II has a shallower planing hull than its 10-year old Defender-class predecessors, which allows it to recover speed after

a turn more quickly.³ It also features a totally redesigned cabin that provides coxswain/crew with 360-degree visibility and better seating positions.

- *45-foot Response Boat Medium (RB-M):* The RB-M is faster, more capable, and more comfortable than the aging fleet of 41-foot utility boats it replaces, and additional sensors, such as maritime forward-looking infrared, enhance search and detection capabilities. The RB-M also boasts new interior design that improves habitability to mitigate personnel fatigue and increase crew readiness.

The 45-foot RB-M has also demonstrated impressive heavy-weather performance. Field operators realized this from the earliest deliveries and began exploring this capability benefit. In certain operating areas where the 47-foot motor lifeboat (MLB) was once the only asset available for heavy-weather response, the expanded RB-M parameters allow this new asset to handle some of the heavy-weather mission demand. While the RB-M is not designed for surf conditions, nor is it intended as a replacement for the MLB, its heavy-weather performance provides the Coast Guard further options for boat allocation and distribution and allows constrained budget resources to be redirected to recapitalize the remaining MLBs.

The Coast Guard received delivery of the RB-M boats in 2008 and now has 149 of 170 total boats in service. Some Coast Guard stations already have the RB-S II, with 78 delivered, and 98 more on order. The replacement process will occur gradually, as the older Defender-class assets reach the end of their service life, and the plan is to eventually procure up to 350 RB-S IIs.⁴

- *Helicopters:* The Coast Guard's fleet of MH-65 Dolphins and MH-60T Jayhawks has been a critical part of SAR operations since the 1980s and 1990s, respectively. Assuming plans continue for service-life extension and recapitalization, the wholesale replacement of these helicopters may not occur until the late 2020s, mid-2030s, or beyond. In the near future, program offices at headquarters and the Aviation Logistics Center will monitor performance and manage support of the current helicopter fleet. Looking further out, mission needs analyses will determine the Coast Guard's future

mission requirements and analyze potential alternatives for transitioning to the next generation of aircraft.

- **Unmanned aerial systems (UAS):** This technology consists of an unmanned aircraft, its mission payloads, ground support equipment, and data and control links. Though still relatively new to the Coast Guard, unmanned aerial system technology could significantly augment search capabilities. Having assets that can fly for 12 hours or more, refuel, and go right back up again, provides a distinct operational advantage. Presently, UAS are not expected to replace manned helicopters; however, that can change for long distance SAR cases offshore, or whenever massive search areas are involved, since unmanned aerial systems could provide persistent search coverage to help pilots and SAR coordinators find victims more effectively.

This type of system was tested in 2012 on the national security cutters, with more demonstrations and testing scheduled. On shore, the Coast Guard has partnered with Customs and Border Protection, flying the Predator UAS on maritime missions. Appropriately, the R&D Center has several projects related to UAS, and personnel are working with the Office of Aviation Forces to build Coast Guard UAS knowledge and determine how to best integrate these assets.

Optimizing the Coast Guard footprint: The Coast Guard integrates new capabilities to improve operational efficiency and save more lives. Additionally, increasing the speed and detection capabilities on Coast Guard response assets means that the Coast Guard “footprint” could be significantly consolidated, as assets operate more efficiently than previous technology allowed.

Preliminary work on this topic has already begun in the offices of Capability Analysis and Boat Forces. Using specialized software, analysts plot historical SAR cases with Geographic Information System overlays to determine where SAR activity occurs, establish peak times of the year for search and rescue cases, and identify excess or deficient Coast Guard capacity.

Ultimately, the Coast Guard wants to ensure that its people and assets continue to be in the right place, at the right time. With faster assets and greater search capabilities, station optimization initiatives will help inform considerations to re-position infrastructure, people, and assets. The challenge is finding the right mix of boat capacity and station locations to balance steady-state operations, and still have surge capacity for mass rescue operations or other contingencies.

Mass Rescue Operations

Whenever a large number of people are in distress in one general location and all simultaneously need immediate assistance, that situation can overwhelm response capabilities readily available to local SAR authorities. Commercial ferry accidents, cruise ship casualties, downed airplanes, or natural hazards such as floods and hurricanes—all are examples of mass rescue scenarios that initiate mass rescue operations (MROs).

As the volume of people who transit on water increases, so does the risk of mass rescue incidents. For example, more than 22 million people use the Washington State Ferry system per year, with more growth expected.⁵ Other major port cities like San Francisco, Miami, Norfolk, New York, and Boston all have robust ferry systems that move millions by water every year, and, as these city populations grow, so too will those ferry systems.

Additionally, individual MRO events may be more severe, as vessels and aircraft passenger capacity expands. Worldwide, total cruise ship capacity is currently about 450,000 passengers and 292 ships; moreover, worldwide the total number of cruise passengers are forecast to rise to 24.1 million in two years (an 11 percent increase from present levels).⁶

Similarly, the aviation industry seems to be favoring larger carriers with increased capacity—witness the Boeing 787 Dreamliner and Airbus 380.⁷ Larger aircraft and increased volume of passengers are projected to steadily rise, with system capacity climbing at a projected annual average rate of 2.9 percent through 2033.⁸

Despite the upward trends, some may contend that just because capacity and frequency of annual voyages are increasing, that does not automatically mean that more MRO events will occur. In general, these newer vessels and aircraft are marvels of modern engineering, and well regulated to ensure trained crews and modern safety equipment. Passengers are arguably safer in these better-designed and more technologically advanced ships and planes.

Still, accidents and disasters will happen:

- The *Costa Concordia* incident was a humbling reminder that no matter how big, cruise ships are not invincible. Admittedly, cruise ships are not sinking every year, but there are at least a handful of at-sea cruise ship incidents that do put lives at risk.
- The forced landing of US Airways Flight 1549 on the Hudson River proved that even though a plane is mechanically sound, it can be brought down by a flock



Lowering the survival craft for the Black Swan offshore mass rescue operation exercise. Photo by Mr. Chris Todd, assistant public information officer, Black Swan Mass Rescue Operation Exercise.

of birds. Fortunately, the incident occurred in an area with plenty of Good Samaritans and local response resources. But, what if it had happened 50 miles off the coast?

- More recently, the disappearance of Malaysian Airlines flight MH-370 prompts one to consider how an effective MRO might be mounted in remote ocean areas far offshore.

Fortunately these incidents offer the Coast Guard a library of lessons learned left in their wake. The *Costa Concordia*, for example, spurred domestic and international scrutiny toward crew training standards, safety equipment, and mass rescue procedures.

In 2013, the Coast Guard took many lessons and rolled them into an exercise to prepare for a major cruise ship catastrophe. Named after a rare event, “Black Swan”⁹ was the largest full-scale exercise in maritime history and tested contingency preparedness and coordination for a mass rescue scenario. In the exercise, an actual cruise ship experienced a simulated catastrophe near the Bahamas, and dozens of international, public, private, non-government organizations, and state entities coordinated to provide resources. Similar exercises are planned for 2015, 2017, and 2019, rotating locations throughout the Western Hemisphere.

In summary, the Coast Guard will continue to improve SAR effectiveness by refining existing capabilities and leveraging new technologies. With maritime traffic projected to increase steadily, during the next 10-20 years the Coast Guard’s continued leadership domestically and internationally is critical to meet rising expectations for cost-effective, steady state emergency response services in the maritime environment and still remain prepared for large, complex contingencies.

Acknowledgements:

Several program offices reviewed and supported this article, for which I am thankful. Certain individuals deserve special thanks: CAPT Peter Martin, Mr. Jack Frost, and Mr. Art Allen, all in the Office of Search and Rescue; LCDR Brian McLaughlin, Office of Aviation Forces; Mr. Thomas Owens, Office of Boat Forces and CDR Aaron Sanders, Office of Performance Assessment and Management.

About the author:

LCDR O’Mara has served in the U.S. Coast Guard for 13 years in capacities from deck officer on a 378-foot high endurance cutter, and commanding officer of patrol boats in California, Bahrain, and Puerto Rico. LCDR O’Mara has earned five commendation medals, and three meritorious unit commendations.

Bibliography:

- U.S. Coast Guard Addendum to the United States National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual, COMDTINST M16130.2F, Jan 2013.
- U.S. Coast Guard Arctic Strategy, May 2013.
- USCG Acquisition Directorate—Rescue 21. Research, Development, Test and Evaluation Project Slate FY14. Washington, DC: U.S. Coast Guard, CG-92, Nov 7, 2013.
- Acquisition Directorate Unmanned Aerial System Project Description.

Endnotes:

1. In ensemble averaging, sets of data are obtained and averaged together to reduce random fluctuations in the signal/data set.
2. Approximately 14 of these aircraft are expected to be acquired 2016-2020.
3. *Coast Guard debuts faster boats for search-and-rescue and more.* Edward Stratton, for the Daily Astorian Apr 4, 2014.
4. *Acquisition Directorate Response Boat Medium Project Description.* Acquisition Directorate Response Boat-Small Project Description.
5. Washington State Department of Transportation—Ferries Division Nation’s Largest Ferry System www.wsdot.wa.gov/NR/rdonlyres/DEC2F450-2726-4185-A879-582DCB857D83/0/WSFFactSheetMarch2013Web.pdf.
6. Cruise Market Watch website, citing Cruise Lines International Association products. Accessed at: www.cruisemarketwatch.com/growth/.
7. *Airbus and Dreamliner Battle for Airspace.* Popular Mechanics, June 15, 2010. Accessed at: www.popularmechanics.com/technology/aviation/news/airbus-vs-boeing-battle-for-air-space.
8. *FAA Aerospace Forecast Highlights Fiscal years 2013-2033.* www.faa.gov/about/office_org/headquarters_offices/apl/aviation_forecasts/aerospace_forecasts/2013-2033/media/Forecast_Highlights.pdf.
9. Culver, P., and Jesse Rangle. Black Swan 2013: A behind-the-scenes look at the Coast Guard’s largest mass rescue operation exercise series. *Proceedings of the Marine Safety and Security Council, Journal of Safety & Security at Sea*, Summer 2014.



Understanding Chloroform

by ENS STEPHANIE KNAUP
U.S. Coast Guard

What is it?

Chloroform, also known as trichloromethane or methyltrichloride, is a colorless liquid with an ether-like odor and a slightly sweet taste. It is not very soluble in water and is extremely volatile. Primarily used as a solvent, chloroform is a heat transfer medium in fire extinguishers. It was used historically as an anesthetic for surgery, and is produced today in the United States to make other chemicals such as dyes, pesticides, and refrigerant.

Chemical companies and paper mills use chloroform. It is found in wastewater from sewage treatment plants and drinking water, as a derivative to a chlorine additive. When chlorine mixes with water, chloroform forms in small amounts, as a byproduct.

Chloroform may enter the air directly from factory discharge or through evaporation from water and soil that contain it. Once chloroform enters the air or groundwater, it has a long residence time. Most chloroform in the air will break down very slowly and will produce toxic phosgene and hydrogen chloride.

Why should I care?

Shipping Concerns:

Manufacturers ship chloroform by truck, rail, barge, or ship. Drums of chloroform are only available in Europe. Chloroform is nonflammable; it will only burn at very high temperatures. When shipping chloroform, it is classified as an irritant and as "harmful," and only qualified individuals should handle it. Since chloroform is volatile, it should be handled in areas with good air circulation and, ideally, with fume extraction.

Health Concerns:

If a person breathes air or drinks liquids containing large amounts of chloroform, this can affect the central nervous system, liver, and kidneys. The major effect from acute inhalation exposure in humans is central nervous system depression. At extreme levels (40,000 ppm), chloroform exposure may result in death. Concentrations of

chloroform between 1,500 to 30,000 ppm produce anesthesia and lower concentrations (<1,500 ppm) cause dizziness, headache, and fatigue.

Large amounts of chloroform can cause sores if it makes contact with skin. The International Agency for Research on Cancer has determined that chloroform is a possible carcinogen.

What is the Coast Guard doing about it?

The U.S. Coast Guard's Marine Safety Manual (USCG MSM) lists chloroform as a readily identifiable chemical hazard. According to the USCG MSM, chloroform is listed as a packaged cargo that is an acute hazard in an emergency response situation, but can become a chronic health hazard. According to the Occupational Health and Safety Administration, the legal airborne permissible exposure limit is 50 ppm, averaged over an 8-hour workday and 40-hour workweek. The Environmental Protection Agency requires all spills containing 10 lbs. or more of chloroform be reported to the National Response Center. The U.S. Coast Guard is required to abide by and enforce these limits and operates the National Response Center. Contact the center at (800) 424-8802, in the event of a spill or emergency with chloroform.

About the author:

ENS Stephanie Knaup studied marine and environmental science at the United States Coast Guard Academy. She is currently stationed on CGC Cypress and interested in a career in response.

References:

- Agency for Toxic Substances and Disease Registry. (1997) *Toxicological Profile for Chloroform*. Public Health Service, U.S. Department of Health and Human Services, Atlanta, Ga.
- Cargo Handbook. Chloroform.
- Ch-14 to Marine Safety Manual, Volume I, Administration and Management.
- DOW Chlorinated Organics—Chloroform.
- EPA. Technology Transfer Network—Air Toxics Web Site—Chloroform. (2000).
- LCDR G. Crettol, Understanding Styrene, *U.S. Coast Guard Proceedings of the Marine Safety & Security Council*, Winter 2013-2014.
- National Response Center (2013).
- Wisconsin Department of Health Services (2013). Chloroform.

Lessons Learned

from USCG Casualty Investigations

In this ongoing feature, we take a close look at recent marine casualties. We outline the U.S. Coast Guard marine casualty investigations that followed, which explore how these incidents occurred, including any environmental, vessel design, or human-error factors that contributed to each event.

Article information, statistics, conclusions, and quotes come from the final, promulgated Coast Guard investigation report.



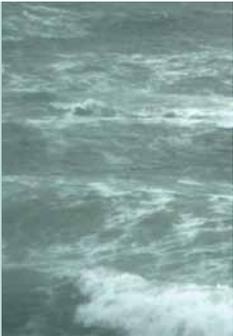
Deadly Excursion

Two die after parasail towline parts.

by Ms. Sarah K. Webster
Managing Editor



In August 2009, two people lost their lives while parasailing. What started out as a popular summer adventure soon turned deadly, when thunderstorms arrived, winds picked up, and the parasail's towline parted.



The *Tied High*, a 31-foot passenger vessel, departed from its dock in Ocean Isle Beach, N.C., at 1 p.m., on August 28, 2009, with eight adult passengers and four minors, to take part in a parasailing excursion. The passengers aboard the vessel did not receive a safety brief by the captain prior to getting underway.¹ The two-person crew, consisting of a captain and deckhand, observed overcast skies, winds out of the northeast at 12 to 17 miles per hour (mph), two-to four-foot swells, 84 degree Fahrenheit air temperature, and water temperature in the mid 80s.

Just as the captain proceeded to the Atlantic Ocean through the Shallotte Inlet, the overcast sky soon turned to rain.

Moreover, shortly after the vessel's departure from the dock, Wilmington's National Weather Service issued a special weather statement at 1:01 p.m., for the parasail operating area, via NOAA's Weather Channel:

*"At 1258 PM EDT...showers and thunderstorms were producing heavy rain...along a line extending from 7 miles southeast of Topsail Beach to 6 miles south of Southport...moving west at 35 mph. These thunderstorms will produce heavy rainfall of up to three-quarters of an inch. Brief wind gusts to 30 mph are possible."*²

The crew did not hear the weather advisory calling for a dangerous storm, because they did not have the vessel's VHF radio turned on. So, they continued with their parasailing plans.

After about a 20-minute transit, it stopped raining, just as the vessel arrived at the parasailing site—approximately two miles east of the Ocean Isle Beach Fishing Pier and a half-mile offshore Ocean Isle Beach. The captain and the deckhand put the first two passengers in tandem flight.³ The captain reeled out approximately 800 feet of parasail towline, and the passengers remained in flight for a total of 15 minutes. Afterward, the two passengers safely returned to the parasailing vessel. However, at about 1:40 p.m., just as the captain put a second set of female passengers in tandem flight and reeled out about 500 feet of towline, the severe thunderstorm arrived. Its outermost bands caused the wind speed to increase from 12 to 17 mph to 19 to 25 mph.

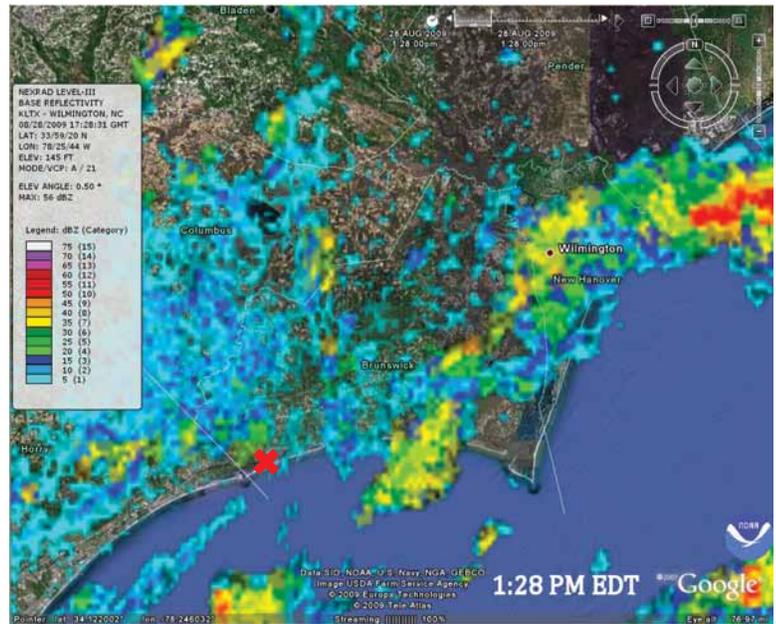
As soon as the wind picked up, the captain decided to terminate the planned 15-minute tandem flight; however, during the retrieval, the captain began using the winch intermittently, which could prevent the winch from overloading. However, with about 250 feet of towline recovered and with strong winds now in excess of 25 mph, the winch failed, and the parasail began towing the vessel backward.

Communication Gets Crossed

Another passenger aboard the vessel sensed immediate danger and attempted to call the vessel owner to report the situation and request help. However, she mistakenly dialed the telephone number of his brother. (Her family had rented jet skis from the brother the previous day, so she had the his number stored in her cellular phone.) She dialed the brother three times: once at 1:42 p.m., at 1:43 p.m., and then at 1:45 p.m.

When the brother received the emergency call, he immediately conveyed the message to the vessel owner. At this time, the owner called the captain via cellular phone, but the captain did not answer the call. However, the owner left a message saying he would send boats to the scene to assist.

By now, the captain attempted to turn the vessel around and head toward the parasail to stop the vessel from towing



National Weather Service radar image, August 28, 2009.

astern, reduce the wind resistance, and take some of the tension and load off the towline and winch. This maneuver may have worked and allowed for the retrieval of the passengers in flight; however, he quickly abandoned the turn, when the overturning moment (port list) created by the towline threatened to capsize the vessel. So, instead, the captain steadied the vessel back into the wind and continued working the winch with no success. Finally, he called the owner—unaware of the fact that the owner already knew about the emergency and had reached out to him.

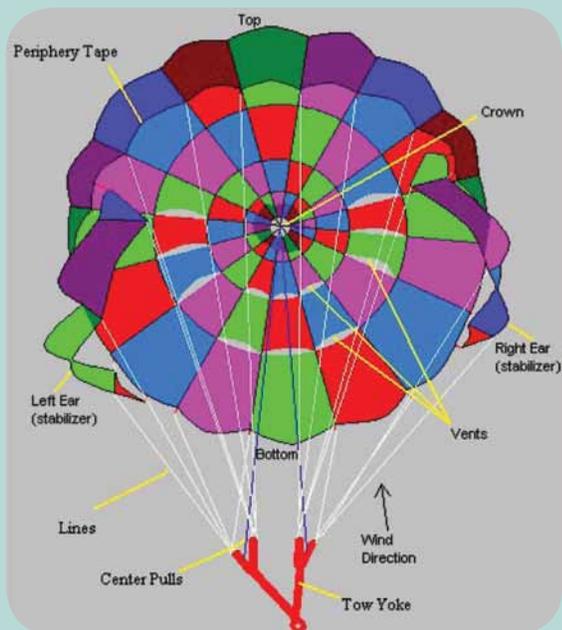
Following the telephone call, the captain instructed the deckhand to drop the anchor. The anchor slipped initially,

continued on page 62



A map of the parasailing incident's operating area.

2002–2009 Parasailing Casualties Study Results



Parasail design elements.

Towline Failures

There were 19 personnel injuries associated with the towline parting.

Towline Failures		Number Injured
Towline failures by number of injuries and severity	Single injury events (10)	10
	Two person injury events (4)	8
	Two person injury and eventual death (1)	1 (1 dead)
Total injured by towline failures		19
Towline failures attributed to weather, winds or seas (gusts, passing weather front movements, and rolling or choppy seas).		12
Total Injured by Towline Failures		19

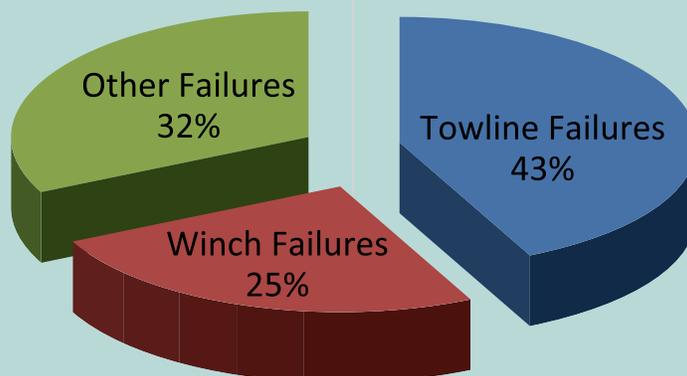
The Coast Guard Office of Investigations and Analysis initiated a study of personnel casualties occurring on parasailing vessels from 2002 to 2009.

In their analysis, they grouped personnel casualties stemming from parasailing activities into three categories: towline failures, winch failures, and other failures. After examining the data, analysts discovered 27 marine casualty investigations (events) involving 44 injuries and one death.

The investigations only indicated that the lines parted and for the most part, did not discuss the type, rating, length, condition of the line in use, the nature of the failure, or conditions that may have contributed to the failure, as in abrasion, age, sun-weathering, and such. These investigations inconsistently recorded the height of the canopy and passengers above ground level. However, there did not appear to be any correlation between the reported height of the fall and the extent of the injuries sustained.

The uninspected passenger vessel *Hi Flyer* on August 18, 2007, near Miami, Fla., was associated with the event that caused an initial injury to two persons and eventual death of one of them, when the towline parted and the parasail passengers struck a building. The towline parted due to wind gusts.

Causes of Injuries



Winch Failures

The eleven casualties associated with winch failures involved the inability to bring the passengers back aboard the vessel. Typically, the operator had difficulty with retrieving the harnessed passengers and returning them to the landing platform on the stern of the vessel.



The winch, hydraulic system, hoses, and towline onboard the vessel.

Winch Failures		Number Injured
Winch failures by number injured	Single Injury events (3)	3
	Two person injury events (1)	2
	Three person injury events (2)	6
Total Injured by Winch Failures		11

Two of the injuries above involved the towline free-spooling (where the towline runs out and detaches from the vessel through the winch). And, two others resulted from the winch being unable to pull the passenger to the landing platform against the head wind.

It was noted that when the retrieval winch failed and no one sustained injuries, that the winch failure itself does not rise to the level of a reportable casualty under 46 CFR Part 4.

Other Failures

The third category involved events where neither the towline nor the winch failed. There were six casualties involving 14 injuries:

Other Failures		Number Injured
Failures other than those involving a towline or winch	Single injury events (6)	6
	Two person injury events (4)	8
Total Injured		14

Breakdown of Other Failures	Number Injured
Fall out of the harness, while aloft and sustained injuries.	1
Struck by the towline-canopy yoke when the part of the assembly failed.	1
Struck by the canopy spreader bar when the vessel suddenly accelerated.	2
Struck with the canopy harness assembly, while being dipped by the operator. Dipping is an activity where the vessel speed is slowed and the passengers are dropped down and "dipped" into the water.	1
Striking a building, while being flown over a section of beach.	2
While still in the harness and connected to the canopy, passenger fell off the landing platform and came into contact with the propeller.	1
Two passengers sustained injuries when their vessel collided with another vessel and they lost their lift, causing them to fall into the water.	2
Three passengers (2 events) were injured when gusts from abeam or abaft the beam displaced the canopy lift, dropping the passengers into the water from height.	3
Vessel operator recognizing the approach of a weather front and changed course from heading into the wind to having the wind off the stern quarter, without winching in the canopy and passengers closer to the boat. The parasail lost its lift and passengers fell to water.	1
Total Injured by Other Failures	14

Information provided by Coast Guard Business Intelligence MISLE Report.



An aft deck view of the vessel.

dug down, and then held. Once the vessel stopped moving backward, the captain put the transmission in neutral and raised the diesel engine's revolutions per minute to increase power to the hydraulic winch. He again attempted to retrieve the two suspended passengers, but despite the increase in the diesel engine's power, the captain still could not retrieve the two female passengers. The winds now ranged from 23 to 34 mph with gusts to 40 mph, and the seas had grown with four- to six-foot swells and with an occasional eight-foot crest. The captain reached out to the owner again.

At the time of the phone conversation between the owner and captain, the owner was away from the office. Upon concluding the telephone call with the captain, the owner called his brother and directed him to get the assist boats ready. The owner told his brother to wait for him at the docks.

While waiting for assistance, the captain allegedly opened the engine room's hatch door to check for winch malfunctioning and leaks in the hydraulic lines, but he detected nothing out of the ordinary. He paid out additional towline to see if the hydraulic fluid was circulating, and the system responded properly. Additionally, after running these basic

system checks, the captain said he was confident the winch worked properly, but the wind working against the parasail and towline exceeded the recovery capacity. He intended to hold the vessel at anchor to prevent the vessel from towing astern. He also made additional attempts to retrieve the stranded passengers by winch, while waiting for assistance.

Around 1:51 p.m., after completing basic hydraulic winch system checks, the captain called the owner again to get a time of arrival estimate. The captain emphasized to the owner that the situation was dire. During the telephone conversation, the vessel's towline broke at the bowline knot attached to the bridle and the wind carried the two passengers in the parasail away from the vessel, and the parasail passengers descended upon the surface of the ocean. Once the still-inflated parasail canopy reached the water, it started dragging the two passengers backward, along the surface of the ocean.

Cut the Anchor!

The deckhand cut the anchor line, so the captain could chase after the two passengers with the vessel. As the vessel came alongside the two passengers, the captain instructed the deckhand to jump from the bow of the vessel onto the parasail to deflate it. The deckhand did as instructed, but missed and went into the water. The parasail continued to drag the two passengers through the waves. The captain left the deckhand in the water to chase after the passengers.

During the captain's second rescue attempt, he passed the two passengers, went downwind and positioned the parasailing vessel perpendicular to and in way of the passengers' expected path; however, the two passengers collided with the side of the vessel and the parasail bridle and gear became entangled in the aluminum superstructure. The captain grabbed hold of the passengers, but lost hold moments



Picture of the *Tied High* aground, post incident.

later, as the vessel rolled to port. The vessel, again, almost capsized due to the wind and inflated parasail.

The passengers, now being dragged through the waves, cleared the vessel, but continued to advance toward the Ocean Isle Beach fishing pier. The captain went back to recover the deckhand, and then gave chase after the two passengers, again.

On the third rescue attempt, the captain instructed the deckhand once again to jump from the bow of the vessel onto the parasail—while traveling at the vessel's maximum speed in the choppy sea conditions. The deckhand made another attempt, jumped, and successfully landed on the flight bar. He reached up with a knife, cut the shrouds, and deflated the parasail. The deckhand and recovered passengers drifted toward shore and washed through the Ocean Isle Beach fishing pier, without making contact with any part of the pier pilings. Now in the surf, the deckhand held onto the passengers and tried administering coronary pulmonary resuscitation (CPR).

As the captain watched the deckhand's rescue attempt, the vessel got caught in the surf. To secure the vessel, the master intentionally grounded the vessel approximately 50 yards east of the Ocean Isle Beach fishing pier.

At about 2:06 p.m., eyewitnesses called the Ocean Isle Beach Fire Department, which also handles emergency medical care. The first responders arrived and pulled the two passengers ashore, relieved the deckhand, and administered CPR. Despite the efforts of the first responders, the two injured passengers were nonresponsive. The first responders suspended CPR and both passengers were pronounced dead. The other passengers who were aboard the vessel required no medical treatment.

Medical Examiner's Report

Neither the medical examiner's report nor this investigation determined exactly what caused the specific trauma that led to the two passengers' deaths. However, both women sustained severe injuries to the head, spine, and other body parts.

Lessons Learned

Coast Guard District 5 convened a one-man formal investigation to determine the causes of this incident and to identify actions to prevent similar tragedies.

The investigator found the parasail canopy, canopy riser, multi-flyer bar, and harness were in good working condition at the time of the casualty, with the exception of the riser's yoke (functional, but in poor condition). The investigator additionally learned the parasailing company did not have any written procedures and policies in place governing the selection, inspection, and maintenance of parasail canopies and harnesses.

Also, all passengers should have received an adequate safety briefing by the captain (or a Coast Guard licensed mariner) prior to parasailing.

Additionally, while Coast Guard regulations specifically address fire, heavy weather, and man-overboard conditions, the Coast Guard cannot ensure that all owners and operators train vessel crews to prepare and respond to foreseeable parasailing emergencies. Unfortunately, neither the vessel owner nor the captain had attempted or practiced basic parasailing emergency scenarios, or kept records of any relevant exercises, drills, or training.

Finally, the investigator noted that the captain failed to exercise good judgment during the emergency, in that he did not hail the U.S. Coast Guard on Channel 16 VHF-FM or dial 911 to request assistance.

Acknowledgement:

Proceedings would like to thank Investigator LCDR Chester K. Warren at CG Activities Far East and Mr. Ken Olsen of the Office of Investigations and Analysis at USCG headquarters for contributing to this story.

About the author:

Ms. Sarah K. Webster is the managing editor of the Proceedings of the Marine Safety & Security Council magazine. She was previously a news reporter and feature writer for Gannett Inc., and a beat reporter for Micro-media Publications. She is working on her M.A. in communication from Kent State University, has a B.A. in communication from Monmouth University, and has an A.A. in humanities from Ocean County College.

Endnotes:

- ¹ The federal regulation of 46 C.F.R. §185.506 requires the captain of a small passenger vessel to provide a passenger safety orientation before getting underway or as soon as practicable thereafter. The required safety orientation focuses on the actions passengers must take during an emergency but does not include aspects of parasail operations. At no time did the captain or his deckhand provide a passenger safety orientation to the passengers as required by federal regulation.
- ² A special weather statement alerts people of a short-term hazardous weather threat, which may require a heightened level of awareness or action. The special weather statement remained in effect until 2:30 p.m., Friday, August 28, 2009.
- ³ Passengers are put in flight and retrieved on the vessel's landing platform, which begins aft of the engine compartment hatch and continues to the stern.

Nautical Engineering Queries

Prepared by NMC Engineering Examination Team

Q

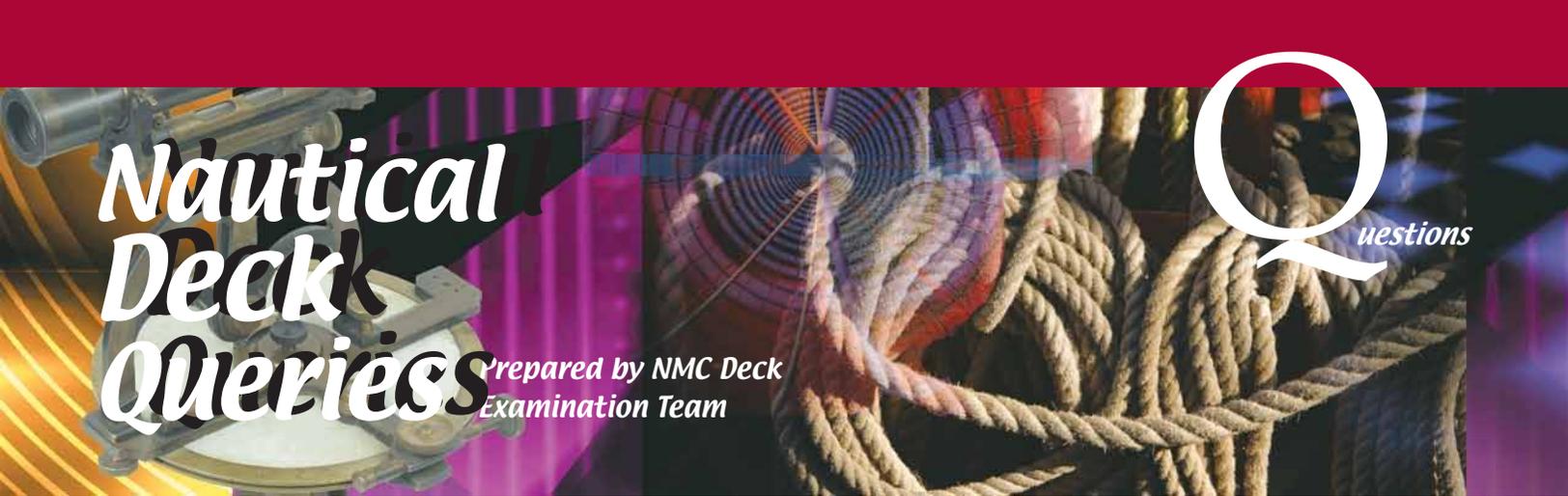
uestions

- 1. Fuses are sometimes placed in series with a thermal trip-type circuit breaker. What is the purpose of a fuse used in this arrangement?**
 - A. time delay protection
 - B. short-circuit protection
 - C. short duration surge protection
 - D. sustained overload protection

- 2. Which type of marine sanitation device (MSD) is used solely for the storage of sewage and flush water at ambient air pressure and temperature?**
 - A. Type I
 - B. Type II
 - C. Type III
 - D. Type IV

- 3. A four-stroke eight cylinder in-line medium speed diesel engine has a firing order of 1-5-2-6-8-4-7-3. If #1 piston is at TDC and in the firing position, #6 piston is on _____.**
 - A. the exhaust stroke
 - B. bottom dead center
 - C. the intake stroke
 - D. the compression stroke

- 4. The flash point of a residual fuel oil should be used to determine the highest temperature to which the oil may be heated _____.**
 - A. for atomizing
 - B. for centrifuging
 - C. in a storage tank
 - D. in the recirculation line

The cover image features a collage of nautical elements: a sextant on the left, a radar display in the center, and thick coiled ropes on the right. The title 'Nautical Deck Queries' is written in a large, white, stylized font across the top left. A large white letter 'Q' is positioned in the top right corner, with the word 'uestions' written in a smaller font to its right.

Nautical Deck Queries

Prepared by NMC Deck Examination Team

Q uestions

1. **BOTH INTERNATIONAL & INLAND:** A power-driven vessel is underway in fog, but is stopped and making no way through the water. What is the required fog signal?
 - A. One prolonged blast at not more than one-minute intervals
 - B. Two prolonged blasts at not more than one-minute intervals
 - C. One prolonged blast at not more than two-minute intervals
 - D. Two prolonged blasts at not more than two-minute intervals

2. How long must a "Declaration of Inspection" be kept on board?
 - A. One week
 - B. Two weeks
 - C. One month
 - D. Three months

3. What purpose does a bridge fitting serve when lashing containers?
 - A. Ties a container stack to the deck
 - B. Ties a container to the container below it
 - C. Restrains racking loads
 - D. Restrains the container against horizontal motion

4. Which of the following may be a characteristic of a lighted cardinal mark?
 - A. group very quick flashing
 - B. group flashing
 - C. fixed
 - D. occulting

1. *Note: Fuses and circuit breakers are devices used for circuit protection. When a fuse is placed in series with a circuit breaker, each device offers a different type of protection that complements the other. The thermal trip-type circuit breaker, acts like a time delay fuse, and will protect a circuit against a small overload that continues for a long time. A magnetic circuit breaker acts like a single element fuse, and will trip instantly when the preset current is reached.*
- A. time delay protection Incorrect answer. A time delay fuse would be appropriate to use with a magnetic trip-type circuit breaker.
 - B. short-circuit protection **Correct answer. A single element fuse provides short-circuit protection and would be appropriate to use with a thermal trip-type circuit breaker.**
 - C. short duration surge protection Incorrect answer. A time delay fuse provides short duration surge protection and would be appropriate to use with a magnetic trip-type circuit breaker.
 - D. sustained overload protection Incorrect answer. A time delay fuse provides sustained overload protection and would be appropriate to use with a magnetic trip-type circuit breaker.
-
2. A. Type I Incorrect answer. A type I MSD is one that through treatment of the sewage produces an effluent (pumped overboard) having a fecal coliform bacteria count not greater than 1,000 per 100 milliliters and visible floating solids.
- B. Type II Incorrect answer. A type II MSD is one that through treatment of the sewage produces an effluent (pumped overboard) having a fecal coliform bacteria count not greater than 200 per 100 milliliters and suspended solids not greater than 150 milligrams per liter.
- C. Type III **Correct answer. A type III MSD is one that is designed to prevent the overboard discharge of treated or untreated sewage or waste derived from sewage. This type of device requires the storage of all sewage and waste onboard.**
- D. Type IV Incorrect answer. A type IV MSD does not exist.
-
3. *Note: On a four-stroke engine all the combustion cycle events for all cylinders takes place in two complete crankshaft revolutions or 720°. On an eight cylinder engine, the interval between firing events is 90°.*
- A. the exhaust stroke Incorrect answer. #4 piston is on the exhaust stroke.
 - B. bottom dead center Incorrect answer. #2 and #7 pistons are at bottom dead center.
 - C. the intake stroke **Correct answer. #6 piston is on the intake stroke.**
 - D. the compression stroke Incorrect answer. #5 piston is on the compression stroke.
-
4. *Note: When determining the highest temperature to which a fuel oil may be heated, the pressure on the fuel and exposure to oxygen must be taken into account.*
- A. for atomizing Incorrect answer. The fuel oil is under pressure and not exposed to oxygen in the fuel supply header prior to reaching the atomizers. The fuel oil is routinely heated above the flash point to attain proper viscosity for atomization.
 - B. for centrifuging Incorrect answer. The fuel oil is under pressure and not exposed to oxygen in the fuel line to the centrifuge and within the centrifuge itself. The fuel is routinely heated above the flash point for centrifuging.
 - C. in a storage tank **Correct answer. The storage tank is vented to the atmosphere and the fuel oil is exposed to oxygen. For safety reasons, the fuel oil must be maintained under the flash point.**
 - D. in the recirculation line Incorrect answer. The fuel oil is under pressure and not exposed to oxygen in the recirculation line. The temperature of the fuel oil in the recirculation line is a function of the fuel supply temperature.

1. A. One prolonged blast at not more than one-minute intervals Incorrect answer. Reference: International and Inland Rule 35. This signal is not utilized in Rule 35 for sound signals in restricted visibility.
- B. Two prolonged blasts at not more than one-minute intervals Incorrect answer. Reference: International and Inland Rule 35. This signal is not utilized in Rule 35 for sound signals in restricted visibility.
- C. One prolonged blast at not more than two-minute intervals Incorrect answer. Reference: International and Inland Rule 35(a). This signal applies to a power-driven vessel making way through the water.
- D. Two prolonged blasts at not more than two-minute intervals **Correct answer.** Reference: International and Inland Rule 35(b). The rule states “ A power-driven vessel underway but stopped and making no way through the water shall sound at intervals of not more than two minutes two prolonged blasts in succession with an interval of about two seconds between them.”
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2. A. One week Incorrect answer.
- B. Two weeks Incorrect answer.
- C. One month **Correct answer.** Reference: 33 CFR 156.150(f) “The operators of each vessel and facility engaged in the transfer operation shall retain a signed copy of the declaration of inspection on board the vessel or at the facility for at least 1 month from the date of signature.”
- D. Three months Incorrect answer.
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3. A. Ties a container stack to the deck Incorrect answer. A combination of twist locks and wire or rods tensioned by turnbuckles are utilized to secure containers to the deck.
- B. Ties a container to the container below it Incorrect answer. Containers are held together utilizing twist locks.
- C. Restrains racking loads Incorrect answer. This is accomplished utilizing rods or wires and turnbuckles on a diagonal configuration at the end of selected containers.
- D. Restrains the container against horizontal motion **Correct answer.** Reference: Merchant Marine Officers’ Handbook, Hayler, Fifth Edition, Page 262. “Stacks are married together with bridge fittings and linkage plates so that adjacent stacks become a single rigidly joined unit, a container block.”
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4. A. group very quick flashing **Correct answer.** Reference: The American Practical Navigator, Bowditch. 2002 Edition, Page 75. “When lighted, a cardinal mark exhibits a white light; its characteristics are based on a group of quick or very quick flashes which distinguish it as a cardinal mark and indicate its quadrant.”
- B. group flashing Incorrect answer.
- C. fixed Incorrect answer.
- D. occulting Incorrect answer.

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