Give Information Personnel More Training and Credibility

By Senior Chief Cryptologic Technician Interpretive James Murphy, U.S. Navy

The field of information operations (IO) continues to develop—and is critical to contemporary warfighting. It is a decisive component of all phases of warfare; as Admiral Mike Mullen said, "In some conflicts, information and non-kinetic means may prevail."[1] IO requires a trained workforce, qualified to dominate the information space. If we establish a rigorous Enlisted Information Warfare Specialist program (EIWS), this will provide the training and recognition that cryptologic and information systems technicians deserve, and it will provide the IO community with Sailors who are better prepared for this specialty.

Information As a Warfare Discipline?

IO is a warfare discipline defined by its type commander (Naval Network Warfare Command, NETWARCOM) as "a warfare area that influences, disrupts, corrupts, or usurps an adversary's decision-making ability while protecting our own" (see www.netwarcom.navy.mil). The terms *Information Operations* and *Information Warfare* have been used interchangeably and are essentially the same.

Over the past 12 years, Joint Publication 3-13 has been called Joint Doctrine for Command and Control Warfare, Joint Doctrine for Information Warfare, and Joint Doctrine for Information Operations. It is telling that under each of these headings, the descriptions list the same goals and essentially all the same sub-disciplines.[2]

According to NETWARCOM, IO today encompasses five pillars: electronic warfare, computer network operations, psychological operations, military deception, and operational security. Computer network operations include three sub-disciplines: attack, defense, and exploitation.

These complex specialties must be used in concert to achieve desired tactical and strategic outcomes. They provide greater situational awareness, effective early warning, and dependable, secure communications. They save lives on all sides by providing more precise targeting and soft-kill or non-kinetic options.

And discussions about information in terms of warfare are becoming more prevalent. In 2007, NETWARCOM Vice Commander Rear Admiral Edward H. Deets III discussed information warfare (IW) and the "Information Operations warfare area" in his *September IW Community Communiqué* (distributed via e-mail). His *Information Warfare Community Strategic Plan* (also distributed via e-mail in September 2007) stressed IW and described Navy IW as a "community of war-fighters who deliver overwhelming information superiority to naval and joint commanders . . . by applying the core capabilities of Information Operations and Signals Intelligence to shape, influence, and defeat adversaries and other audiences in support of commanders' objectives and to provide warning of adversary intent."

There is no doubt this is a warfare community. And it is one that needs a qualification program to formalize Sailors' broad training continuum, recognize their expertise, and increase their professional credibility. It is within this context that the Enlisted Information Warfare Specialist program must be established.

PROPOSED EIWS PIN **A breast insignia should display characteristics of the qualification. This drawing includes historic and contemporary elements of the Enlisted Information Warfare Specialist mission.**

Reasons for a Warfare Qualification

Several warfare programs have been established in recent years—notably the Seabee Combat Warfare Specialist and Expeditionary Warfare Specialist—and the Fleet Marine Force program gained designator status.[3] These communities recognized the benefits of standardized qualifications; the IW community should do the same.

Selection boards place great emphasis on qualifications when choosing the best Sailors for advancement and other programs, and Sailors dedicate significant time and effort to earning them. The Navy will be better served when IW professionals focus their efforts on their primary discipline before pursuing additional qualifications.

Many IW Sailors lack permanent billets afloat. Instead, they serve on a temporary basis and earn warfare qualifications during limited deployments when and where their particular skills are needed. These qualifications remain important career milestones. But they take Sailors' time and focus away from progression in advanced rating-specific training.

The EIWS program will allow Sailors to qualify whether or not they are deployed, and will focus their efforts on IW. Cryptologic Technicians (Networks) have no sea-duty billets, yet they are among our most skilled information personnel, and they deserve the opportunity to achieve a warfare qualification.

Naval Network Warfare Command Sailors currently learn little outside their own rating, a training shortfall that was identified across the Department of Defense as early as 2003. "The complexity and technological growth in EW, PSYOP and CNO [electronic warfare, psychological

operations, and computer network operations, three of the five IO pillars] tend to isolate the specialists who practice these disciplines from one another."[4]

The EIWS program will correct this deficiency and help to avert a future training gap. The Navy is moving forward with a plan to "align Naval Intelligence into a renamed Naval Network Warfare Command," as Rear Admiral Deets said in his *IW Community Communiqué.* The EIWS program will help bridge the knowledge gap between NETWARCOM and Office of Naval Intelligence Sailors as they begin working together more than ever.

A strong foundation in each pillar will greatly increase information warfighters' breadth of knowledge and increase their effectiveness in planning and conducting operations. The EIWS program will help "establish IO capabilities specialists" and "provide focus for enlisted" IO Sailors—two of the DOD recommendations to overcome the training shortfall. This increased knowledge is essential to realizing the full benefits of FORCENet, "the operational construct and architectural framework for Naval Warfare in the Information Age."[5] It will push forward IO force development, which must include "a trained and educated career force."[6]

We Also Need Trained Officers

A parallel IW Officer (IWO) program will serve our officers well, especially in joint assignments. As things are now, IW officers serving on joint staffs as IO planners might be qualified surface warfare officers or naval aviation observers, or they might wear an enlisted qualification. These mean relatively little to their other-service IW counterparts and provide no indication that the officer is actually qualified in IW.

Rear Admiral Deets addressed this, if only coincidentally, when he wrote of the need to "identify career milestones and equivalency standards that are recognized both in and out of the IW community for officer promotion." IWO qualification will fulfill that requirement by identifying these officers as professionals in and out of the Navy.

Additionally, an IWO qualification supports Rear Admiral Deets's initiative to "develop . . . an officer training continuum model." This can be based on the "PQS [personnel qualification standards] requirements for IW Officers" that are already under review. Moreover, it will build trust and confidence in the knowledge and abilities of Navy IW officers, which the Joint Chiefs of Staffs call "demonstrated competence" and "understanding the abilities each member brings to the team."[7]

A mandatory and focused IW qualification will overcome current training shortfalls and drive the Navy toward fulfillment of its FORCENet vision. This is the way ahead for the Navy in developing its IW workforce.

Qualification Requirements

An effective EIWS qualification will be similar to existing programs in that it will encompass a broad base of knowledge, beginning with mastery of one's own specialty. After initial skills training and positional qualification, Sailors will master their subspecialty—essentially this is A-school and PQS completion, along with demonstrated in-depth subspecialty knowledge.

The second requirement is a thorough understanding of the other IO pillars and how they are used collectively. The third is an understanding of how IO missions relate to the actions of the other warfare communities and the use of strategic communications.

Information warfighters must appreciate how we use non-intelligence information and activities "to understand and engage key audiences in order to create, strengthen, and preserve conditions favorable for the advancement of [our] interests, policies, and objectives."[8] Strategic communications require knowledge of foreign cultures—specifically how information is used, shared, and understood by adversaries and potential adversaries.

IW specialists can never hope to learn every culture they will encounter. Instead, they need a basic understanding of culture itself, of how and why people think and react differently, and why similar actions will not necessarily have the same effect, or influence, on different adversaries.

Creating the EIWS PQS should be a priority. This means NETWARCOM should form a working group of experts in each IO pillar charged with determining the depth and breadth that each operator requires outside of rating-specific knowledge, skills, and ability. A similar working group should determine IWO requirements using as a guide the IW Officer PQS, developed by NETWARCOM and the Center for Information Dominance.

The Time Is Now

The breast insignia awarded for EIWS and IWO qualification should include a few key symbols. The primary ones are a spark and quill, the spark from the Information Systems Technicians and Cryptologic Technicians (CT) rating badges, the quill from the CT and Intelligence Specialist rating badges. A globe would signify worldwide presence and NETWARCOM's role as the Navy Space Type Commander. A wreath of olive branches would symbolize one of the most important goals of IO: to promote peace.[9]

It is time for the Navy to formally recognize IW as a warfare discipline and give IW professionals the credibility they deserve. The Navy has been involved in IW, in one form or another, since its creation on 13 October 1775.

Countless working hours have been dedicated to formalize, professionalize, and adapt IO and IW to the information age. A great deal more progress can be made toward that goal. Longstanding and impending training gaps can be closed with a relatively small investment. The Navy's IW professionals need a targeted qualification program.

1. ADM M. G. Mullen, *CJCS Guidance for 2007-2008*, 1 Oct. 2007, p. 5. Available at http://www.jcs.mil/CJCS_GUIDANCE.pdf.
2. GEN Abe C. Linn, "Comparison of the Information Warfare *Capabilities of the ROC and PRC*," abstract, 27 December 2000. The abstract of General Lin's thesis provides a quick comparative history of JP 3-13 and is available at http://cryptome.org/cn2-infowar.htm. The major difference between the IO and IW definitions in JP 3-13 is the timing of the operations. The IO definition does not mention when the operations take place, whereas the IW definition specifically stated "during times of crisis."
3. For a history of establishment of the Seabee Combat Warfare Specialist program and device, see CAPT Larry G. DeVries, CEC, USNR (Ret.), http://home.earthlink.net/~larrydev/SCWSdesignpage.html. See MC3 Emily Zamora, "Expeditionary Warfare Device Approved," *All Hands,* November 2006, No. 1075, available at www.navy.mil/media/allhands/flash/ah200611/atf/index.html/. See also Navy Personnel Command, NAVADMIN 129/95.
4. Department of Defense, *Information Operations Roadmap*, 30 October 2003, p. 32. Declassified version available at http://www.gwu.edu/~nsarchiv/NSAEBB/NSAEBB177/info_ops_roadmap.pdf.
5. See http://forcenet.navy.mil/fn-definition.htm.
6. DOD, *Information Operations Roadmap*, p. 70, Appendix B, Recommendations 15 and 17. See also Naval Network Warfare Command: The ForceNet vision is "the operational construct and architectural framework for Naval Warfare in the Information Age that integrates warriors, sensors, networks, command and control, platforms, and weapons into a networked, distributed combat force . . . the means by which naval forces will make net centric warfare an operational reality." See also Christopher J. Lamb, "Information Operations As a Core Competency," *Joint Force Quarterly,* no. 36. Available at http://www.au.af.mil/au/awc/awcgate/jfq/1536.pdf.

7. RADM Edward H. Deets III, *Strategic Plan*, Achievement Plan, items 2.c.8, 2.c.1, and 2.c.6. See also Joint Chiefs of Staff, Joint Publication 1: Doctrine for the Armed Forces of the United States, 14 May 2007.
8. Joint Chiefs of Staff, Joint Publication 3-13, Information Operations, 13 February 2006. Available at http://www.dtic.mil/doctrine/jel/new_pubs/jp3_13.pdf.
9. JP 3-13, p. II-8.

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Battlefield Casualty Care: How We Can Do Better

By Hospital Corpsman First Class Juan Madrid, U.S. Naval Reserve

After an extended tour as a medical corpsman in Iraq serving with a Navy–Marine Corps Forward Resuscitative Surgical System (FRSS) Team, as well as providing training support for four SEAL teams, I have witnessed the opportunities and challenges involved in delivering medical care to wounded Marine Corps and special operations combatants.

Proceedings has done a fine job of highlighting the importance of our FRSS teams (see, for example, Captains H. R. Bohman, Bruce C. Baker, and Rom A. Stevens, "Forward Resuscitative Surgery in Operation Iraqi Freedom," February 2004). Despite such coverage, Navy medical personnel operate with one hand tied behind our backs. We are not saving every wounded person that we could be.

FRSS is a cutting-edge capability that has already saved scores of Marines, Soldiers, and special operations combatants, as well as wounded Iraqis. But while the enthusiasm of Captain Bohman (who is recognized as the father of FRSS) and others remains high, some have criticized the concept, including within the pages of *Proceedings* (see Commander Joseph Rappold, "FRSS Teams: A Good Idea Whose Time Has Passed," February 2007). Some extol the virtues of the FRSS; others criticize the very existence of FRSS units operating close to the front.

Who's Right?

All of these articles are on target. But they could push their ideas even a bit further in describing what the future of FRSS in the military could and should be. What both advocates and critics have missed is the need for *speed* in the employment of FRSS capabilities—especially in the environment of Operation Iraqi Freedom, where there are no front or rear lines.

This is a life-or-death issue, as study after study has shown. With major traumatic injury, survival or death are the two outcomes fundamentally affected by the speed with which the wounded person receives medical care.

Limitation of the Current Setup

Navy and Marine Corps doctrine places FRSS teams within the Force Service Support Group of Marine Corps units as part of a medical battalion. Here they often work in conjunction with a shock and trauma platoon. Currently, to deploy an FRSS team to the front requires two Humvees and support trailers to deliver the necessary equipment and personnel (one general surgeon, one trauma surgeon, one anesthesiologist, one critical care nurse, one operating-room nurse, one independent duty corpsman, one operating-room technician, and one general duty corpsman). They set up inside two tents within one hour of arrival. An FRSS team is designed to handle up to 14 operative cases in the first 24-hour period after setup.

But this method of deployment is fraught with danger, as *anything* moving on the ground in Iraq is subject to the ever-present threat of roadside IEDs and other weapons. The enemy sees any movement as a target.

U.S. AIR FORCE (MYLES D. CULLEN)

"FRSS STRIKE" HELO Forward Resuscitative Surgical System teams could save more lives if they could medevac using helicopters with enough room for in-flight intensive care and even surgery. Here, a U.S. Army air ambulance specialist shields a patient from the sun during transport to a combat support hospital in Baghdad.

Our FRSS teams can only do so much—and they can only be in so many places at once. During my time in Iraq, March through July 2003, the Navy provided a total of five FRSS teams in support of Marine Corps units. This was good, as far as it went.

Iraq is a country roughly the size of California and, as pointed out by Commander Rappold and others, once an FRSS team is set up, it often sits idle waiting for casual-

ties to arrive. If its location is unfortunate, it goes unused or underused.

Captain Bohman et al. say in their 2004 *Proceedings* article: "The FRSS can be carried by rotary and fixed-wing aircraft, naval surface vessels, or by two high-mobility multi-purpose wheeled vehicles with trailers" (p. 73). But four years after this trailblazing article, we still use only the last option it mentions: ground transportation.

Time to Update Methods of Transport

I have yet to meet a military medical professional—doctor, nurse, or corpsman—who does not share my view that sending an FRSS team to the battle via a suitable helicopter would be far superior to the way we do business now. We would definitely save more lives.

Some in the military medical community have dubbed this idea "FRSS Strike." It would involve a fully up-and-ready FRSS suite (personnel and equipment) standing by on what would essentially be a strip alert, which is a state of readiness for domestic defense aircraft. One or more helicopters could respond instantly to the ever-fluid battlespace, delivering the capability to perform on-scene life-saving resuscitative surgery *when* it is needed, precisely *where* it is needed. This would eliminate the IED or ambush threat.

If the helicopter was large enough and could be configured appropriately, it might even be possible for doctors to provide medical care, including major surgery, inside the aircraft. This would provide a more secure area than a canvas tent. More than once, I have witnessed bullets come within close range of our FRSS tent while doctors were providing life-saving surgery.

Focusing on a dedicated helicopter(s) to deliver this capability would also help to solve another significant problem we face in the field. FRSS teams have performed heroic *resuscitative surgery* and stabilized the wounded. But for more serious injuries, this initial intervention must be followed up with *definitive surgery* at a higher echelon of care, such as a field hospital or afloat facility on amphibious assault ships of the *Tarawa* (LHA-1) or *Wasp* (LHD-1) classes. Helicopters would allow us to get them there.

Currently, not one helicopter in the military inventory allows us to transport a patient and provide the same level of critical care and monitoring as he received after his surgery. This type of "complete enroute care" is not provided even on lifts of opportunity (helicopters not designated as air ambulances or for medevac) such as Marine Corps CH-46s and CH-53s, Navy MH-60Ss, nor on lifts by Army air ambulances (UH-60Q) and other helicopters. This puts our wounded directly in harm's way, as they must travel with a degraded level of care while they are moved rearward to receive definitive surgery.

Improve the ERCS

The Enroute Care System (ERCS) was developed for critical care transport and treatment of casualties while they are transferred to a higher level of care. ERCS is in place now, but methods are inadequate because of the lift constraints discussed above.

This lack of capability also impacts the special operations community, to which no FRSS or ERCS units are assigned. We experience the same lack of medical capability on helicopters that deliver SEALs to forward areas and serve as lifts of opportunity for extracting wounded to medical facilities in the rear, or afloat. The FRSS Strike concept could easily be adapted for use by the Special Ops community.

In a November 2007 speech at the Army War College, Chairman of the Joint Chiefs of Staff Admiral Mike Mullen said: "The changes and breakthroughs in battlefield medicine have been incredible. It is difficult to predict what these will mean in the future" (see George V. Galdorisi and Scott C. Truver, "The Golden Hour for Wounded Warriors," *Military Medical Technology* 12, no. 3 [2008], http://www.military-medical-technology.com/article.cfm?DocID=2417).

As a member of the medical community, I have seen many of those breakthroughs firsthand. Those of us in this line of work know what is needed to deliver a higher level of care to the wounded. In that same speech, Admiral Mullen said: "Taking care of those wounded in battle is a top priority for me." If it is a top priority for the nation's highest-ranking military officer, we need to move forward and make the concept of FRSS Strike and ERCS a reality. Our warriors deserve nothing less from the world's greatest military.

In 2003, HM1 Madrid was assigned to the 1st Marine Division 1st Medical Battalion Echo Company and served with FRSS team 5. He is a Special Amphibious Reconnaissance Corpsman, Master Training Specialist (near completion), and Navy Instructor/Tactical Combat Casualty Care Instructor. Police Officer Standards and Testing certified, he is a Nationally Registered Emergency Medical Technician paramedic and certified court interpreter/translator. HM1 Madrid is assigned to Naval Special Warfare, Operational Support Team One, Jungle Warfare Training Detachment, as the assistant leading petty officer for the Medical section.

Navigating the USNS *Comfort*

By Captain Ed Nanartowich, U.S. Naval Reserve (Retired), U.S. Merchant Marine

Tried and true shiphandling methods saved the USNS *Comfort* (T-AH-20) on several occasions during her Partnership for the Americas deployment, 15 June–15 October 2007. The ability to con a ship with vigor demonstrates competence and confidence to those learning from your practiced moves. This is not only a matter of pride, it's part of your daily routine.

Many time-tested resources are available to help, including Russell S. Crenshaw's *Naval Shiphandling* (Annapolis MD: Naval Institute Press, 1974), which remains especially valuable for maneuvers. Admiral James Stavridis and Captain John Girrier's *Watch Officer's Guide* (Naval Institute Press, 2007) focuses on the virtues of a competent watch officer, emphasizing forehandedness, vigilance, judgment, experience, leadership, technical knowledge, and energy. Calm reserve is stressed, along with the need for a ready backup plan (including several al-

U.S. NAVY (JOSHUA KARSTEN)

DRIVING A FORMER SUPERTANKER **During her 2007 humanitarian mission to Latin America and the Caribbean, the *Comfort* navigated through tight spots to provide medical treatment in a dozen countries. She was the largest ship ever to enter Acajutla, El Salvador.**

ternatives) when executing a maneuver. The *Comfort* used backup plans more than once while implementing tactics that are known well enough—but rarely used.

We called on ports that a ship of this size seldom visits. Hydrographic information is sketchy in many of these areas, and this was a constant concern while navigating in the littoral waters of our host nations. With a huge sail area, the ship has a horsepower-to-tonnage ratio of about 0.4. Compare that to a nimble combatant with a ratio of 12 or better. Now add the sail area of the exposed hull, and you have a ship that is not very maneuverable in tight areas such as harbors or pierside, and is susceptible to wind effect.

The *Comfort*'s underwater hull area is very large and reacts significantly to tidal and wind-driven currents. Any shiphandler easily recognizes the maneuvering challenges of such a sizable and unwieldy craft. The fundamentals of the ship's responsiveness were a constant factor during our four-month deployment.

First Port of Call

Both of the Military Sealift Command's hospital ships (the other is the *Mercy*, T-AH-18) are converted *San Clemente*-class supertankers. To maneuver a former supertanker requires significant planning and preparation. Navigating the *Comfort* through Belize's maze of coral atolls demonstrated that point. The channel leading to Belize City is part of the second-largest barrier reef in the world. My navigation team and I superimposed the channel on a radar relative motion plot and on an electronic chart display information system. Using Differential Global Positioning System, I ran the simulation at sea in Force 8 conditions off the Virginia coast. This gave me an advantage with no risk, and we wound our way into port smoothly.

Departing Belize required innovative, yet simple techniques. We used the "poor man's tug": dredged the anchor. This involves holding your anchor at short stay and driving your ship in the required direction, while pivoting on that anchor. We needed to make a 180-degree turn within coral boundaries, and did so in less than a ship length using this method.

Heading South

From Belize we navigated our way down to Puerto Barrio, Guatemala. Here the *Comfort* went to anchor. Every evening like clockwork winds increased, and squall lines with 20–40 knot winds passed though our anchorage area. To bring patients and passengers on board from small boats, we had to provide a lee for them. This reduced the wave action significantly.

To create a lee we used a technique that would quickly change the heading of the ship while achieving little forward speed. The method is aptly termed "pumping the rudder." We applied full rudder, ordered a significant ahead bell on the main engine, and the ship turned enough to create a lee by this pumping action to the rudder.

This gave us about three minutes to drive the small boats alongside, discharge 30 passengers and gear, and clear away. We would use this control maneuver in many of our upcoming ports of call. It sounds easy enough, but for a ship 900 feet in length with a displacement of 70,000 tons, you need to control the forces that may strain the chain and work against your good intent.

The Atlantic ports of Belize and Puerto Barrios, Guatemala, were a warm-up for transiting the Panama Canal. The other side would tax our shiphandling to the limits of risk.

Corinto, Nicaragua, is an open roadstead anchorage on the Pacific side of our operating area. We anchored 1.5 miles off land and had about a three-mile-run from the ship to fleet landing. The anchorage is open to a persistent ocean swell and occasional cross swells, and on the receiving end of evening squalls and passing microcells. For small boat operations, this sea state proved challenging.

Every ten years in Corinto, a "storm of the decade" rolls through—and we bore witness to the phenomenon. Early on the

morning of 21 July 2007, visibility was nil, winds were 50 knots or better, and the *Comfort* started dragging anchor. Unfettered, a ship will generally lie beam to a wind. We were dragging so easily and fast that we had a similar lie. The starboard anchor was down with six shots of chain out, the ship lay port side to the wind and dragged, with zero visibility and rain coming down in torrents.

The starboard anchor was underneath the hull of the ship, perpendicular to the port side and dragging. Another anchored ship was directly in our drag path, only half a mile away.

It's a rare day when you use two anchors in an open anchorage. In a Mediterranean moor you use two anchors, but rarely at an open anchorage with a diurnal tide swinging the ship. Given my dilemma, I dropped the port anchor. This held, and stopped the ship from dragging. We avoided a collision with the other ship, got our engines up, and stayed in position for the night.

On this deployment, with this ship, I needed to anchor on two anchors twice. The next time was in anticipation of dragging in a gale in another port of call.

Tight Spots

We were the largest ship ever to enter the port of Acajutla, El Salvador. It took 2.5 hours to go a mile to the pier. Upon entering the harbor, we had a throttle problem when the hydraulic linkage became disconnected, and we had no control of our ahead steam. As we entered the harbor, I aligned the ship early for our approach to the berth, with low speed hovering around bare steerageway. This gave us minimal control of our ability to steer the ship effectively.

The ship was very close to the breakwater rocks when the throttle problem complicated our day, but because of our low speed and alignment, we were able to control the situation and maneuver out of a potentially disastrous situation and proceed to safe waters. Engineers fixed and recalibrated the linkage. Two hours later, we were pierside.

In a few ports control had to be taken from the pilot, or the pilot was given guidance throughout a maneuver. At such times, lessons learned in the 1980s at the once-famous Navy Little Creek Shiphandling School, Virginia, were invaluable because of the manned-modeling method.

Manned models are scaled-down versions of real ships of the class, and they react exactly as does that class. The difference between this method and one that uses simulators is exposure to the elements. Driving rain, wind, and water depth affect your ship. They also affect the conning officer in ways that make him think about the way the ship is behaving or is going to behave. Manned models offer realism second only to your actual full-scale ship.

Similar schools such as the Massachusetts Maritime School and those at Warsash Maritime Academy, England; and Grenoble, France, used the Little Creek School as a template for their development. Onboard the *Comfort,* my training continued to pay significant dividends as I approached each shiphandling trial.

Knowing Your Ship's Idiosyncrasies

The *Comfort* has her particular handling characteristics, as does every ship. *Watch Officer's Guide* is an excellent compendium of typical responses we expect a ship to present to the shiphandler. In varying sea and weather conditions, the *Comfort* behaved as the forces acting upon her allowed—and these reactions sometimes differed from what I expected.

To be effective, I needed to know the ship's tendencies. For example, with a right-handed propeller backing down, one expects the ship to back to port. The *Comfort* does this in a calm. With a wind on her starboard beam and the ship moving astern, she actually backs to starboard as the peripatetic pivot point of the ship moves aft, and the sail area wins over the dynamics of propeller side force.

This is a nice thing to know with marginal sea room, and when maneuvering in piloting waters such as those of the Panama Canal and tight berths in Manta, Ecuador; and Acajutla, El Salvador.

In the Panama Canal, bank effect motivates the ship to move in ways you absolutely need to anticipate. Passing an opposing ship at close quarters draws your ship toward that vessel as each one "pushes" a wall of water at the bows, leaving a low-pressure area between the ships.

Slow speed and early alignment of your ship generally offer you more than one alternative to counter adverse situations. In Captain Robert Meurn's *Watchstanding Guide for the Merchant Mariner* (Centerville, Md.: Cornell Maritime Press, 1990), shiphandling is accurately called a science. "Each time a ship moves, the precise influences acting on her are different from the way they were at any other time; the ship responds to every one of these influences" (p. 100). With the *Comfort* and any other ship, the need to feel, sense, and anticipate these influences is real. Then it is time to respond.

Captain Nanartowich is a Master Mariner with the Navy's Military Sealift Fleet Support Command headquartered in Norfolk, Virginia. A 32-year employee with MSC, he has commanded more than 20 USNS ships since 1981. In 2007 and 2008, he commanded the *Comfort* on two separate medical missions. As a reservist, he has taught at the Little Creek Shiphandling School on several occasions, and at the Marine Safety Institute facilities in Norfolk.